

# Specifics of Functional Planning and Architectural Organization of Religious Educational Complexes as a New Type of Educational Institutions

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## Annotation

The article identifies the specifics of shaping the architecture of religious educational complexes as a new type of religious educational institutions. On the basis of the consolidation of international scientific and practical experience in the design and construction of religious educational institutions, the author substantiated the functional structure and functional relationships of religious educational complexes, provided the typology and characteristics of main functional groups of premises.

The article specifies the methods of functional and planning organization of religious educational complexes, including modular, pavilion, combined and compact, wherein the latter is regarded as optimal in case of designing religious educational complexes in an urban area. The planning schemes and a composition structure of religious educational complexes are also discussed.

Alongside with the development of complete compositional solutions of religious educational complexes, it is proposed to create dynamic evolving compositions, making it possible to carry out further reconstruction or construction of new functional units.

The article also discusses the types of volumetric and spatial composition, identifies the main approaches to creating architectural expression and harmonizing the architectural space of religious educational complexes.

*Key words:* Architecture of religious educational institutions, Sacral architecture, Synamic architecture, Functional and planning organization, Volumetric and spatial composition, Universal space, Transformability, harmonization.

## 1 Introduction

The experience of the development of civilization shows that education is the foundation of spiritual, social and economic development of society.

In recent years, religious life in Ukraine has significantly intensified. According to statistics, a steady increase in the number of religious organizations has been observed in Ukraine since 1997. New religious buildings and complexes are constructed, which determines the need for clergymen, superiors and counsellors – graduates of religious educational institutions. The relevance of the research issue for Ukraine is also demonstrated by the amendments recently introduced to some laws of Ukraine by the Supreme Council of Ukraine, related to the possibility of the foundation of educational institutions by religious organizations. For instance, official religious organizations are allowed to found higher, vocational, general education, preschool and out-of-school institutions that will give children from religious families an opportunity to receive education in a religious environment and strengthen moral values of the younger generation.

Currently, although Ukraine is a multi-religious society, the architecture of educational institutions of some Christian (Catholic, Protestant) denominations, as well as Muslim and

Jewish institutions, remains understudied, despite the presence of a fairly large number of representatives of these denominations in the territory of Ukraine.

The issue of designing religious educational complexes as a new type of religious educational institutions has not been studied in both domestic and foreign science. Identification of the specifics of shaping the architecture of religious educational complexes will make it possible to improve design solutions, optimize and improve their functional and planning structure, harmonize the relationships between the architecture and architectural environment.

## 2 Methodology

The study is based on the approaches that regard religious educational complexes as a complex system phenomenon, which requires a comprehensive study by related sciences such as philosophy, art history, religious studies, history.

The following methods were used in the course of the study: field survey of religious educational institutions of Ukraine, CIS countries and countries outside the former soviet Union; questionnaire survey of representatives and management of educational institutions; comparative analysis of foreign and domestic experience of design; system approach; environmental approach; graphic-analytical method and experimental modeling method.

The method of field survey was used to study the current state and the experience of design and construction of Christian, Jewish and Muslim religious educational institutions in the territory of Ukraine and abroad (in Russia, Belarus, Uzbekistan, Poland, Italy, Turkey).

The review of the current state of the design and usage of religious educational institutions in Ukraine provided an opportunity to identify both disadvantages and positive aspects, while comparative analysis made it possible to determine the ways of further improvement and development of these institutions. The disadvantages of religious educational institutions in Ukraine are the following:

- facilities and resources of 50-60% of the surveyed objects don't meet contemporary requirements to modern educational process.
- the majority of religious educational institutions do not have their own premises, designed for academic process, and are housed in adapted buildings not having all necessary functional groups of premises.

The applied method made it possible to identify the need for the modernization of existing religious educational institutions, as well as the need for the introduction of a new type of building – a religious educational complex designed with regard to the basic modern educational requirements.

The method of questionnaire survey involved interviews and a survey among teachers and management of religious educational institutions. Respondents had to answer, what the spiritual education will be like in the near future, in which direction it is necessary to improve exiting institutions, what a religious educational institution of the 21st century should be like. Clergymen were also asked to answer the questions about the desired optimal functional composition of modern religious educational institutions and their spatial organization. On the basis of the analysis of a large number of answers and interviews it was assumed that there is a need for the introduction of a new type of integrated religious educational institution with a sufficiently large amount of functions – a religious educational complex. The introduction of the concept of a religious educational complex to the architectural vocabulary made it possible to offer new trends of shaping the architecture of religious educational institutions, aimed at improving the conditions for obtaining spiritual education.

The method of comparative analysis was used to study the typology of religious educational institutions of Ukraine, CIS countries and countries outside the former Soviet Union. This method made it possible to identify similarity and differences in the architecture of religious

educational institutions of different countries, different denominations and types, to propose a universal functional structure of institutions that can be used by Christian, Muslim and Jewish denominations when designing religious educational complexes.

### 3 the Main Part

The creation of religious educational complexes (campuses) is one of perspective lines of the development of religious educational institutions.

For the development of the concept of the creation of religious educational complexes it is necessary to recall the experience of medieval universities. Towns-universities, such as Oxford or Cambridge, are the examples of modern cooperated educational establishments, comprising several educational institutions [20]. The contemporary experience of design and construction of religious educational institutions of the Catholic Church should also be taken into account [21].

Therefore, alongside with the modernization, reconstruction and expansion of the resource base of existing religious educational institutions, an attempt should be made to organize campuses – complexes comprising several religious educational institutions of different levels. However, in order to provide the conditions for educational process in an educational establishment, it is necessary to carry out a series of studies to substantiate the functional composition and zoning of the complex with regard to the technological process, power supply and the specifics of operation.

An educational unit comprises: a group of classrooms for training specialists of primary, secondary (including vocational) and higher level, as well as teachers' rooms and rooms of departments. These rooms can be housed either in one unit or in several separate educational units. Functional longevity of an educational unit will provide the flexibility and dynamism of its planning organization and structure [4].

If territorial resources permit, it is expedient to use a separate unit of a religious educational complex for the organization of production and training workshops (for icon-painting, gold-embroidery, carpentry -specialized in manufacturing kiots and iconostases), as well as classrooms for choral singing and teaching choirmasters.

A sacred unit comprises sacred rooms and a group of auxiliary premises (baptistry, acolyte's room, sacristy). In the general composition of a religious educational complex, the sacred unit is usually placed separately, but if the territorial resources are limited it can have a form of an extension to educational, refectory or housing units of the complex, or have the form of a house church.

The architecture of a sacred unit brings uniqueness and specificity into the composition of religious educational complexes of different denominations [15]. The architectural and planning composition of this unit has a number of traits that are common for the studied five major religions [17, 18,].

For example, the sacred core of an Orthodox educational institution (an Orthodox church) is formed by the following three parts: the altar, the place of prayer and the narthex [19]. The altar in the orthodoxy is regarded as a sacred spot; the middle part is a place of prayer for the congregation; the narthex is a scope of earthly existence. An Orthodox church is considered to be a symbol of the Universe, and its entire architecture symbolically embodies the Christian idea of the connection between earthly and heavenly [3].

The altar of an Orthodox church is always oriented to the east and separated from the prayer hall by the iconostasis, which is regarded as a baffle separating the two worlds [12].

A Catholic church (the sacred core of a Catholic educational complex) has, in general, the same structure as an Orthodox church. An essential difference of its internal structure is the absence of the iconostasis. A Catholic church also consists of three parts: the central part of the church; altar, or presbytery, where the Holy Gifts are stored; and the narthex [11]. The planning structure of a Catholic religious building, in a similar way to the configuration of an Orthodox

church, can include special places for chorus and separate premises for church ministers and for the storage of vestments [9]. The altar of a Catholic church is also oriented to the east.

Protestant Houses of Prayer are free from exuberant decorations, icons and sculptures. Such decoration is unnecessary for Protestants, because in this faith there is no worship of icons in the form in which it can be observed in Catholic and Orthodox churches [1]. A church can be housed in any building, which is rented or purchased; there are no strict prescriptions regarding the orientation of certain groups of premises. In general, however, the Protestant theology does not contradict the theological decisions of Oecumenical Councils. Protestant Houses of Prayer usually also have a three-part structure: the entrance area (a counterpart of narthex), the prayer hall itself and the sacred area with a place for a sermon.

In the prayer hall of a mosque, next to the mihrab, a minbar (a pulpit for a preacher) is constructed, which is a counterpart of the pulpit of Protestant religious buildings, the ambon in Orthodox and Catholic churches, the bimah in synagogues. As in the Orthodox Christianity, the rectangular foundation of mosques symbolized the Earth, while the spherical dome – the Heaven [13].

The internal arrangement of a synagogue is also based on the construction of a temple, which in turn recreates the internal design of the tabernacle (framed rectangular space with the sanctuary in the middle). That is why a synagogue usually has a rectangular shape. In the part where in a Christian church there is a sanctuary, in synagogue there is a receptacle called Aron Kodesh, containing Torah scrolls. In the center of a synagogue there is an elevated platform from which the Torah is read – the bimah [8]. Synagogues must be placed in such a way that the wall, near which the Aron Kodesh is placed, is directed towards Jerusalem. For Jewish synagogues this means orientation to the east, as well as for Christian and Muslim religious buildings.

In the planning structure of a settlement a synagogue is usually placed at the highest point, which is also characteristic for religious buildings of the above-mentioned denominations. For this very reason the sacred core of the general composition of a religious educational complex should play a dominant part in the general architectural and spatial composition.

Thus, the above-discussed sacred units of religious educational complexes of five major religions as an integral component of such complexes, while definitely having their distinctive features, have also much in common.

An administrative unit of religious educational complexes comprises the following service rooms: an office of a superior (a rector), offices of deputies, accounting department, administration, etc.; a group of health care premises; a group of auxiliary and subsidiary premises (premises for the production of candles); a refectory group.

Multifunctional religious educational complexes may also comprise a missionary and charity unit, in which groups of premises for missionary-volunteer activities should be provided; a group of premises for psychological and physical rehabilitation of children and adults who find themselves in difficult circumstances; rooms for counselling with priests, psychologists, lawyers; rooms for temporary stay of people who need shelter; a medical aid station; a refectory; sacred rooms.

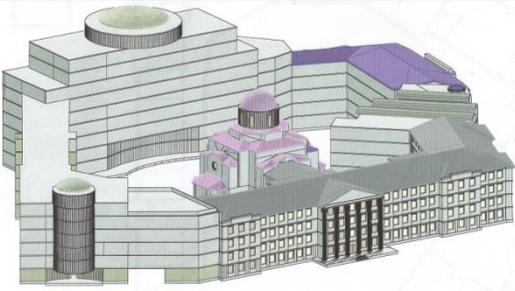
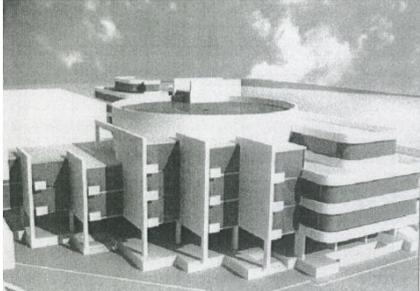
The analysis of the structures of existing religious educational institutions showed that in order to ensure their functional longevity or the possibility of technical modernization with regard to modern requirements of constantly changing educational process it is reasonable to use universal units with flexible planning, on the basis of which dynamically developing systems can be organized [4].

Due to the principle of universality, a unit can perform an educational, administrative or recreational function. Such a unit is a single flowing space, divided in a way determined by functional reasons. Only basic structural elements of this unit are fixed: vertical structures and utility systems, as well as main load-bearing structural elements [5].

A general functional structure of major religious educational complexes (intended for 700 and more students) contains the maximum number of functional units, which are united into architectural and planning schemes by means of functional and compositional relationships.

The units of of religious educational institutions form various volumetric and spatial compositions, among which the following types can be specified: closed, semiclosed and open (Table 1).

**Table 1.** Types of volumetric and spatial composition of religious educational complexes

Closed	Open
	

Now let us focus on the types and the analysis of the basic groups of premises, which form the above-discussed units of religious educational complexes, and propose a typology of premises (Table 2).

The entrance group of premises of various functional units usually consists of an entrance hall, a cloakroom and sanitary facilities. The primary purpose of the entrance hall is to rationally organize the flows of students, teachers and guests of the complex. The entrance hall of a religious educational complex can be used not only for serving visitors, but also for educational, missionary and club work; it can also serve as a reception room. Such an entrance hall/reception room can be designed as open space, forming a part of back rooms or a corridor. The optimal solution is the one that makes it possible in case of necessity to separate the entrance hall as an independent space using sliding partitions.

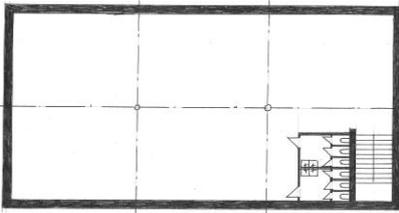
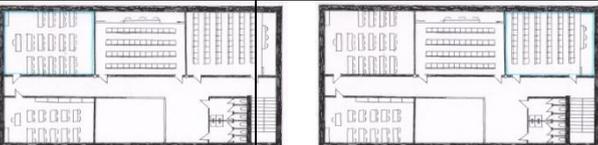
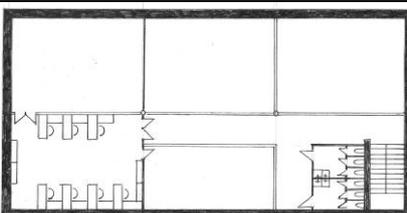
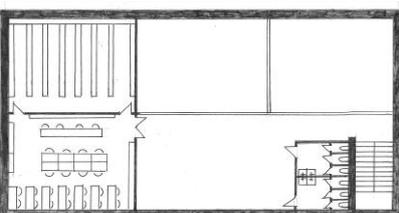
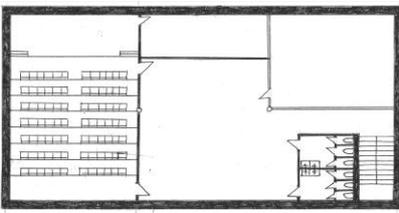
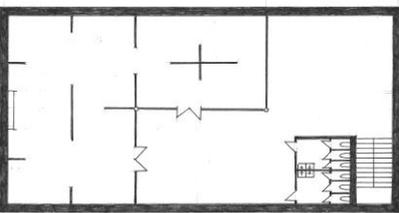
The main groups of premises in modern religious educational complexes are training and applied training groups of premises comprising classrooms, lecture rooms, music and rehearsal classrooms, choral singing classrooms, icon-painting, gold-embroidery, cabinetry and carpentry workshops.

Classrooms intended for 10-25 students are the main premises of the complex, because students spend there most of their time. The most optimal form of a school room may be a rectangular shape with a longitudinal external wall and the dimensions in the axes 3 \* 6 m, 6 \* 9 m. Such proportions make it possible to arrange students' desks in three rows, thus ensuring the optimum illumination of all work areas. Using another constructive decision makes it possible to obtain a classroom of the third type, intended for 25-50 students.

When designing religious educational complexes, more complex forms of classrooms can also be used: trapezoidal, pentagonal, hexagonal, etc. Classrooms having a trapezoidal shape make it possible to conveniently group desktops with the possibility of allotting a separate area for a personal prayer. In the premises having a pentagonal or square shape it is easier to organize workplace illumination using natural light [6].

However, nowadays the requirements to the illumination of premises cannot be considered to be most important ones, because students often use a PC for capturing information received from a teacher; in this case the presence of natural lightning is not a mandatory requirement. Non-standard forms of classrooms open new possibilities for architectural and artistic solution of the interior of a religious educational complex, providing more freedom in arranging equipment and making it possible to organize a sacred area in classrooms.

**Table 2. Typology of premises**

Multipurpose room	
	
Classroom for 20-25 students, audience	
	
Workshop	
	
Reading room	
	
Assembly hall	
	
Exhibition room	
	

By virtue of the latest technologies, currently it is not necessary to organize equipment of a classroom in such a way that all the attention is focused on a teacher's work area. The possibility of installing several monitors in a classroom to broadcast the lecture material eliminates the need to focus attention on one area, which also makes it possible to arrange workplaces not in a straight-line scheme, but radially or in segments.

The survey showed that the process of training in higher religious educational is effective in classrooms with a capacity of no more than 25-30 students for seminaries and 20-25 students for academies.

Lecture rooms should be intended for 50-100 students. A progressive and cost-effective direction of the universalization of educational units and creating audiences of large capacity is the possibility of the transformation of medium sized lecture rooms into larger ones.

Handicraft rooms (icon-painting, gold-embroidery, cabinetry workshops) should be placed on the ground floor; it is also possible to place them in basements with mandatory natural lighting.

The cultural and recreational group of premises comprises library premises, a publishing center, Internet rooms; a group of premises for meetings and discussions; club and entertainment premises, exhibition rooms, halls, lounges.

A library is the embodiment of an educational institution, its intellectual center, where the knowledge of previous generations is stored. It is formed on the basis of the premises of a reading room with an area for working with books and periodicals, reading newspapers and viewing microfilms, listening to audio records, the premises of circulation department, catalogue, storeroom, open-access fund.

The size of a reading room depends on the number of students in the religious complex. The transition to the electronic storage of information eliminates the need for the organization of reading rooms in the classic sense with fixed workplaces. Students can receive required materials, books or publications in an electronic form and process them in any place of the educational complex, which is most comfortable for the work.

The most important features of a library are flexibility and multi-functionality – the possibility of using the working rooms also for classes, meetings, exhibitions.

A group of entertainment premises is very important in the structure of a religious educational complex. The assembly hall of a religious educational complex is generally used to hold solemn meetings, deliver lectures, etc. When designing an assembly hall, it is necessary to provide for the possibility of its multiple use, for example, as a conference hall, a concert or an exhibition hall. One of the options is using the assembly hall as a large lecture room. Besides, an assembly hall should have the capability to be transformed into a number of smaller audiences intended for 50-100 places, which will increase the efficiency of its use.

Modular planning should be used when designing medium-capacity religious educational complexes. Efficiently connected functional units will ensure the optimal arrangement of the basic functions of religious educational complexes in individual units, provide a communication link between units through covered walkways or galleries.

The advantage of this method of designing religious educational complexes is the possibility to isolate units and simultaneously provide a direct connection with the entrance area.

Pavilion planning is most widely used when designing medium-sized and large religious educational complexes. On the basis of this planning method it is possible to extend religious educational institutions through the construction of additional buildings and link units. This type of planning structure makes it possible to use plots with a complex terrain [10].

A disadvantage of this composition is the elongation of the functional links between units and groups of premises.

Combined planning is used when designing large-capacity religious educational complexes. It makes it possible to create expressive architectural compositions, optimize functional links, ensure optimal orientation of premises.

According to the planning scheme, several types of compositions of religious educational complexes can be identified: T-shaped, H-shaped, E-shaped, O-shaped, perimetral, rectilinear, curvilinear, etc. All existing compositions are the result of the improvement of functional and technological schemes and the aspiration to improve the architectural space of religious educational complexes.

According to the communication structure, the following compositional schemes of religious educational complexes can be identified: corridor-type, non-corridor, hall, enfilade and combined.

Corridor schemes are characteristic of linear buildings of religious educational complexes. A corridor system consists of cells that are linked by a common linear communication – a corridor.

A non-corridor system integrates cells containing a part of the cycle of the general process in a religious educational complex. The link between the cells is represented by premises – a hall or a lounge, rather than a linear communication. Such premises usually have their own particular purpose – a place of meetings, recreation, discussions and debates.

The schemes described above can be used when designing religious educational complexes of different denominations (Orthodox, Catholic, Protestant, Muslim, Jewish). When designing religious educational complexes, it is reasonable to combine the above-listed schemes, thus obtaining complex mixed and dynamic compositions.

The prevalent compositional techniques of shaping and harmonizing the internal space of religious educational complexes are coloristics and ergodesign techniques that help create a truly comfortable artistic environment for effective learning and spiritual development.

#### 4 Discussion

The study is based on the works by both domestic and foreign scientists in different areas of science:

- scientific works on religion by P. Florensky;
- scientific works on the history of sacral architecture and the history of the Church by N. Budur, I. Bondar';
- scientific works, devoted to the study of architecture of religious educational institutions, by O. Zhovkva, R. Stots'ko and V. Proskuryakov.

The study is also based on the works, devoted to the general theoretical problems of designing educational institutions, by such scientists as V. Ezhov and P. Solobay.

The study also relies on the works, devoted to the general theoretical and practical problems of architecture and the development of sacral architecture, by A. Gutnov, A. Gayduchenya, E. Voznyak, Sh. Shukurov, O. Boyko, E. Kotlyar, V. Kutsevich et al. These authors address the issues of shaping an architectural and artistic image, compositional solutions of architecture objects, including sacred ones.

The architecture of Orthodox and Catholic religious educational institutions is also discussed in the monograph by R. Stots'ko and V. Proskuryakov "Architecture of Religious Educational Institutions of the Ukrainian Greek Catholic Church" and the monograph by O. Zhovkva "Architecture of Orthodox Religious Educational Institutions of Ukraine", in which the authors conducted a study of the architecture of religious educational institutions of two influential Christian denominations and analyzed the typology of these institutions.

"Selected works on art" by the priest P. Florensky provide a deeper understanding of the symbolic essence of an orthodox temple and sacred art. In the work "Iconostasis" Florensky paid much attention to the canonical interpretation of the configuration of an Orthodox temple and its altar. According to Florensky, "... the altar means a human soul, and the temple – a body" [15]. This work made it possible to deeper understand the essence of the configuration of a temple as an integral part of an Orthodox educational complex.

The issues of the universality and transformability of space were discussed in the works by a number of scientists and architects, such as A. Gutnov, A. Gayduchenya. For example, A. Gutnov in the book "World of architecture" discussed the issue of universal and free space of buildings and structures, relying on the idea of free planning declared by Le Corbusier [14]. Using universal spaces and units in designing religious educational complexes makes it possible to improve the rationality of functional planning organization of such complexes.

The above research and writings offer an opportunity to understand the state of knowledge on the issue of designing religious educational complexes and sacred buildings as their integral part.

These works cover the issue of temple construction and shaping the architecture of religious educational institutions. However, the issue of the complex shaping of the architecture of religious educational complexes of the major world religions remains understudied. That is why the issue of the development of architectural and planning solutions of religious educational complexes requires a comprehensive study and the preparation of relevant scientific guidelines and design recommendations.

## 5 Conclusion

A modern trend in designing religious educational complexes is the pursuit of universality and ensuring the possibility of the versatile use of premises and units, which would eliminate the problems of fast “moral” depreciation and obsolescence. The internal segmentation of such universal structure is carried out using facilities not associated with basic design structures: mobile partitions, walls, screens, etc.

The basic requirement to the functional planning organization of premises of religious educational complexes is the possibility of flexible transformation, free planning. Free planning will not only ensure the freedom in the search for optimal planning solutions and flexible transformation during the operation of a complex, but also brings into the internal space something new through the use of transformable partitions and bay window partitions that will make the interior more expressive.

Currently, a religious educational complex is understood as an environment that corresponds to the aesthetic and philosophical views of our time and provides favorable conditions for study, spiritual and physical development, self-improvement, teaching and scientific activity, accommodation and recreation. A religious educational complex should ensure the proper functioning of the educational process, provide an opportunity to hold meetings, exchange thoughts and have a rest. A religious educational complex is not only a temple of science, but also an environment designed for the education of an intelligent and humane personality. Therefore, the architecture of a religious educational complex as a temple of science should keep up with the times [16].

The proposals, obtained as a result of the study, may be used in the process of designing religious educational institutions and complexes.

The study determined the prerequisites for the development of a modern religious educational institution, as well as the need for the systematization of the scientific knowledge on architectural design and forecasting the development of religious educational complexes.

On the basis of the consolidation of international scientific and practical experience in the study, design and construction of religious educational institutions the author substantiated the need for the development of a new type of a religious institution – a religious educational complex, its functional composition, structure and functional links.

The study proposed a typology of the premises of religious educational complexes and a list of functional groups of premises of a modern religious educational complex including: educational, applied training (workshops), sacred, cultural, recreational, sports, administrative, medical, refectory, utility and housing groups of premises.

The paper specifies the methods of functional and planning organization of religious educational complexes – modular, pavilion, combined and compact, wherein the latter is regarded as optimal in case of designing religious educational complexes in an urban area.

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