

**Short Reports**

**THE MAIN DESIGN FEATURES OF THE TEMPLES**

Moskaeva A.S., Kocheva E.A., Smirnova E.V.  
*Nizhny Novgorod State University of Architecture and Civil Engineering, Nizhny Novgorod, e-mail: scald1966@mail.ru*

Russian Orthodox churches are unique architectural structures, amazing by their beauty with a long history of the establishment. Some of them were constructed in the middle ages. Great masterpieces of the architects, the past masters, sometimes had been created for more than several decades and every detail of the temple has a deep meaning and significance. Volumetric layout design of the temples is necessary to analyze the design features for the engineering systems to establish and maintain the required indoor microclimate characteristics in the buildings for public worship.



The main feature of temple construction art and creativity is the necessity to follow the canonical church requirements, based on the Orthodox dogma and tradition [1].

Orthodox churches can be divided into several groups, depending on the differences related with the functional features of the temples, their types, volumetric layout design, wall materials and the capacity.

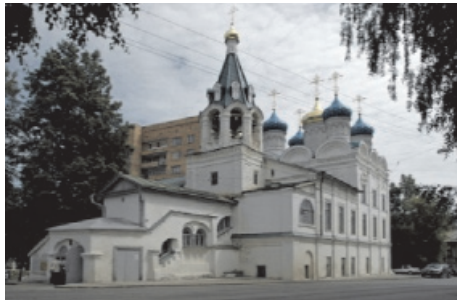
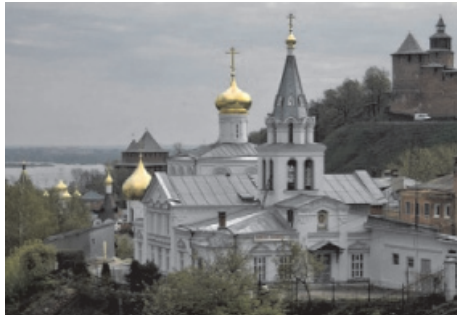
By a capacity the parish churches are divided into the following types: small size churches, with the area of the middle part from 25 to 90 m<sup>2</sup> with a capacity from 60 to 600 people; middle size temples, with the area of the middle part from 90 to 250 m<sup>2</sup> with a capacity from 300 to 300 people; large size parish churches, with the area of the middle part from 250 to 500 m<sup>2</sup> with a capacity from 600 to 1,500 people; very large parish churches, with the area of the middle part of more than 500 m<sup>2</sup> and a capacity of more than 1,500 people [2].

There are several types of the temples: cross-domical, central-domical church, basilica, pillar-shaped. According to the functional features the temples are divided into: cathedrals, temples, monasteries, parish, manor, cemetery, tombs, monuments, home churches, temples at the public institutions (schools, nurseries, prisons) and chapels. Basic constructions of temples are shown in Table.

Construction of temples

Construction Scheme	Description	
1	2	
1. Cross-domical summer temples		
Cross-domical cathedrals having six internal pillars	 <p style="text-align: center;">Spaso-Preobrazhensky Cathedral of the XVIII century. Nizhny Novgorod</p>	Constructive basis is the span or three-span arch-rack systems. Exterior walls are a key stiffening component. In the temples with six internal pillars bearing is carried out on the four eastern pillars
Monastery temples having four internal pillars		
2. Temples having two pillars		
Temples having two pillars	 <p style="text-align: center;">Transfiguration Cathedral in from Purekh Chkalovsky district Nizhny Novgorod Region</p>	The system of three parallel barrel vaults was used in the overhead cover. They were supported by 2 pairs supporting arches which were moved from the pillars on the eastern and western walls. They can be symmetric and asymmetric. In symmetric system there is a big light cylinder, which is located in the centre. It is supported by the pendentive on the borders edges of the light cutout. In asymmetric system the light cylinder is above the eastern central cell and supported by the eastern and central supporting arches and partially on the tetrahedron eastern wall

## Termination of the Table

1	2
Pillarsless temples	Pillarsless overhead covers became widespread as a simple or steeped cylinder vaults which were supported by the lengthway walls in the XV–XVI centuries. Since XVI c. the crossed vaults were used for the small sized overhead covers. They represented the combination of 2 pairs crossed cylindric arches, bearing light cylinder, with the corner parts of the cloister vault
Pillar shaped temples	Distinguished by the hard centre and almost complete symmetry
Steepled temples	There are two types of constructions. The first type uses the method of completeness of the tetrahedron by the open inside tent. In the second type the tent functioned only as a decorative element and was put on the cloistered four-chuted vault covering the tetrahedron
Temples with no pillars and cloistered vault	 <p>One of the methods of ending is five-domed. It represents the imitation of the forms of the temples having four pillars. The other way is to end the tetrahedron as a hillock of kokoshniks. Often such temples were ended with one hollow or light dome</p> <p>Church Holly Myrrhbearers, Nizhny Novgorod</p>
Parish churches «ship-sized»	 <p>While constructing the parish churches the compositional methods were widely used. Along with the asymmetric groups of churches, the churches with the lengthway axial symmetry began to appear. The main volumes were put along one axe from east to west</p> <p>Church of Elijah the Prophet, Nizhny Novgorod</p>
<b>3. Types of church buildings with complex composition</b>	
Churches with Γ-shaped and T-shaped planning	The room of the warm church which was adjacent to the back wall of the cold church was becoming larger in the lengthway size by the means of setting the side chapels with the altar apses

The basic materials for the walls of the temples are: boulder, white stone, brick and wood. The form of the temple can be quite diverse.

To intensify the aeration the architects applied the principles of aerodynamics. Here we are considering the increasing of the airflow with the help of outside and inside the streamlined forms of the structure such as: kokoshnik, barrel, tent.

Nowadays during the reconstruction and construction of the temples, special attention should be paid to ensure the required parameters of the microclimate. To provide the Orthodox churches comfort, reduce heat loss and increase the duration of operation and maintenance period of the building envelope it is necessary to design heating and ventilation systems.

When designing the ventilation systems in the prayer halls of the Orthodox churches the preference should be given to the natural ventilation systems. However, for the design of natural ventilation systems the factors that affect the internal and external aerodynamics of the Orthodox churches should be taken into account. One of these factors to make the heat balance of the prayer's hall is the consumption of the church candles in an Orthodox church.

In comparison with the mechanical ventilation systems the natural ventilation systems do not consume electrical energy, require less maintenance costs and installation due to the self-regulation, and changes in the difference between the balance of supply and discharge of air heat we can achieve the heat savings from 20 to 50% [2].

In conclusion it should be noted that the forms of the temples significantly affect the uniformity of airflow inside the temple, which requires the carrying out the research work in order to provide the required parameters of the microclimate in the temple [3].

#### References

1. MDS 31-9.2003. Orthodox churches. B. 2. Orthodox churches and complexes. – Intod. 2003-01-01. – M.: Arhhram, 2003. – 182 p.: Ill.
2. Kochev A.G. Climate of the Orthodox churches: monograph; Nizhegor. state. arhitektur.-building. Univ. – Nizhnyi Novgorod: NNGASU, 2004. – 449 p.: Ill.
3. Kochev A.G., Moskaeva A.S., Kocheva E.A., Martynov A.A. STUDY problems of thermal stability of walling orthodox churches // Modern high technologies. – 2015. – № 8. – P. 36–40; URL: <http://www.top-technologies.ru/ru/article/view?id=35095>.

#### CASE METHOD AS ONE OF THE INNOVATIVE TEACHING METHODS

Nechaeva T.A.

*Southern Federal University, Taganrog,  
e-mail: englishfromtatiana53@mail.ru*

Foreign language fluency applicable to the professional world is a necessary component in making modern education relevant [1]. This includes knowledge in a second language relevant to business and other fields of employment. Its success depends on innovative ways of organizing the learning process, such as through a case study method [2].

The case study method has long been used in education overseas, and its value is well established. The purpose of this method is to use descriptions of specific situations or problems, emulating from daily life or in different organizations. It focuses on studying the problems and searching the options for its solutions, followed by analysis of the value or detriment each option may elicit. To make this work, it is imperative that the examples selected for each case study be rooted in plausible, potential scenarios which professionals face in their work.

Educational tasks should involve students in discussions, contemplate the problems and should not have a unique solution. Such activity is usually a group activity and takes the form of a discussion in which students organize disputes and express their opinion. During the discussions, the students apply their knowledge of dealing with such problems; apply the knowledge previously obtained in learning foreign languages [3].

Using such methodology in teaching foreign languages helps develop language skills and general common competences: to make decisions in standard and non-standard situations; work in a team; effectively communicate with colleagues and customers, and; find and use information necessary for the efficient performance of tasks [4].

The value of such an approach is well documented. Students have demonstrated a positive at-

titude to case studies. It best prepares them for the unexpected, and creates confident workers. This method helps students to get theoretical information and to use it in practice. It generates interest and positive motivation to learning.

Teachers should know that case-study method is not the only method in teaching foreign languages. Students involved in the decision of the case, can compare, give definitions, suggest solutions to problems, etc. The teacher, using the case study method should know that students could suggest either correct or wrong solutions or decisions. The role of the teacher is to guide the students through the Socratic process of considering options, not denying the student this process of discovery by telling them a singular answer. One of the main tasks for the teacher, using the case study method is the involvement of students in the analysis, discussion and problem solving. A case example selected must be of relevance to the students' professional interests. The students should contribute to their own education and experiences to their group. Interesting stuff and the possibility of applying professional knowledge encourage students to participate in the debate. The desire to solve the problem encourages students to not only read the case, but also carefully study it, to master the facts and details. The students will also improve and enlarge their vocabulary, learn idioms, new syntactic structures etc. Furthermore, students should be carefully prepared to prove and justify their views in a foreign language. Professional knowledge and confidence in the ability to solve the problem facing the group, is an incentive for mastering communicative skills in a foreign language.

This process stimulates a desire to work toward improving the knowledge of a foreign language [5]. Students improve grammar, help participants clearly express their thoughts and to convince the members of the group [6].

This method of learning a foreign language based on real or fictitious situations has great prospects in the professional training of future specialists. In learning a foreign language in high school, the case study method is used to create a language environment and conditions for formation the situation necessary to use a foreign language as an intercultural communication means.

#### References

1. Rindina J.V. Teaching English to students (modelling of problem situations). – 2013. – № 9 (56). – P. 467–469.
2. Pakhtusova E.E. Case method in teaching English // Young scientist. – 2014. – № 7. – P. 532.
3. <http://www.moluch.ru/archive/24/2591>.
4. Pakhtusova E.E. Case method in teaching English // Young scientist. – 2014. – № 7. – P. 534.
5. Goncharova M.V. Case method in teaching managers. – 2004. – P. 95–100
6. Iluina O.K. Case method in teaching process. Part 1. – M., 2009. – P. 253–261.