Scientific base of reusing of the cultural heritage asset

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Abstract. Currently, the process of growth and development of cities continues, including through the integrated development of already built-up areas, in connection with which there is a problem of intensification of the use of their territory. Objects of cultural heritage, as objects of everyday life of people of past historical epochs, occupy the most valuable territories in terms of urban planning. At the same time, a large number of cultural heritage sites are not included in the life of the city, because they are in an accident condition and have strict regulations for use and transformation. The article provides an example of an algorithm for working with an object of cultural heritage in order to adapt it for use as a social object in the conditions of complex development of the territory (renovation). The type of social object is determined taking into account the priority in the renovation conditions in two stages. At the first stage, taking into account the enlarged criteria, at the second - taking into account the regulatory technical requirements and technical characteristics of the object itself. As a result of the research work, the optimal type of use of the cultural heritage object (further– OCH) "Estate Lapino - Spasskoye ", XIX-beginning of XX century." in the city of Korolev, Moscow region in the conditions of complex development of the territory. Keywords: cultural heritage sites, renovation, social facilities, integrated development of the territory, historical and cultural potential.

1 Introduction

The preservation of OCH, as valuable objects of the history and culture of the people, is one of the most important tasks in the implementation of urban development activities [1]. Much attention is paid to the ways of preserving OCH in its original form, but not enough attention is paid to the issues of economic use of OCH. The adaptation and further operation of the OCH are difficult due to the approved regulations or technical features of the object itself [2]. Moreover, due to limited funding, it becomes difficult to maintain the integrity of the OCH, which often leads to the loss of the object of protection of the object itself.

Many OCH are located inside the built-up and actively used territories of settlements, occupying the most valuable sites from the construction point of view. In this regard, it becomes urgent to solve the problem of the involvement of the OCH territories in economic life.

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At the same time, the construction of many territories of cities, including those adjacent to the territories to the OCH, is morally outdated. Therefore, the activity plan of the Ministry of Construction of Russia for the future includes work on the renovation (integrated development) of built-up areas [3].

A comprehensive solution to these problems can be the adaptation of OCH for the implementation of social functions during the complex development of residential functional zones. Adaptation, that is, the use of cultural heritage objects in modern conditions as social objects, solves not only the task of using the existing material base, but also the task of reviving historical heritage, as well as the development of adjacent territories by increasing the importance of the OCH territory to the local district center of the city.

If an acceptable type of use of the object is established, taking into account its technical features, external restrictions, the mode of use and social needs, it is possible to include the OCH in the agreement on the integrated development of the built-up area.

The purpose of this work was to study the possibility of using the OCH "Estate Lapino - Spasskoye”, XIX- beginning XX century, in the city of Korolev, Moscow region" for modern use as a social object in the complex development of the territory.

The objectives of the study included:
1. Collecting information on the existing technical condition of the OCH, the retrospective use of the territory, the current external restrictions, the mode of use and the subject of protection of the OCH;
2. Search for a possible type of use of OCH among social objects according to enlarged criteria;
3. Clarification of the choice of a social object according to the regulatory requirements for capital construction projects with appropriate specialization.

2 Materials and Methods

The research used materials from regularly updated information systems, such as "Consultant", databases of scientific publications, the Internet to search for information about the historical past of the OCH territory, as well as an information system of urban planning activities to analyze the general plan of the city of Korolev, territory planning projects and OCH rules.

To achieve this goal, the previously developed method of adapting OCH for modern use as a social object in the complex development of the territory was applied [2]. The choice of the type of use was carried out among the main social facilities (the list was obtained based on the analysis of renovation experience in Moscow), for which OCH could be used depending on their current condition, urban needs for social infrastructure facilities and the territory around them. When choosing, the proposed step-by-step algorithm for adapting OCH for modern use was used with an assessment according to groups of criteria that are mandatory for specific social objects.

Specialists have long been interested in finding and determining a careful and at the same time effective method of adapting cultural heritage objects for temporary use, which is confirmed by numerous studies on this topic both in Russia and abroad. A review of the literature on adaptation to the use of cultural heritage objects of various typologies is contained in the work of Belgian scientists Bie Plevots and Kenraad van Kleempoel [4]. Various approaches to the involvement of OCH in economic life [5-9], management of the use of OCH [10-13], as well as the importance of such actions for the "green agenda" are widely presented in foreign literature [14-15].

Russian scientists in their work "Strategies for increasing the efficiency of the use of cultural heritage objects" T.V. Abankina and P.V. Dergachev presented a study to assess the current state of estate complexes in the Moscow region [16]. The territories of manor
complexes were identified for possible adaptation for modern use and the main problems were identified, such as the destruction of the cultural heritage of the Moscow region, the presence of interdepartmental barriers to the interaction of culture, healthcare, education, sports and tourism, the lack of development of public-private partnership mechanisms, low level of involvement public associations and interested citizens in the monitoring and examination of cultural heritage objects. New approaches to the restoration and reconstruction of cultural heritage sites are also proposed. Epifanov S.V. divides these works into four categories, each of which describes traditional methods of restoration or with the use of new reconstruction practices [17]. The division into four types of structural models of OCH allows us to clearly define further types of work that we can produce with OCH.

3 Results and Discussion

Currently, pilot projects have been launched in the Moscow Region for the integrated development of territories in some municipal formations, including in the city district of Korolev. For projects, first of all, territories are selected on which dilapidated, emergency low-rise buildings are located, having sufficient land resources for potential integrated development for multi-storey residential construction.

The city of Korolev is located in the north-east of Moscow, has a population of about 225 thousand people and belongs to the category of "large cities", occupying an area of about 4000 hectares (without the territory of NP "Losiny Ostrov").

Historically, there were several settlements on the territory within the borders of the present Korolev, each of which had a city-forming enterprise, thanks to which it lived and developed, socially significant objects such as schools, gymnasiums, hospitals, temples, estates often appeared nearby. Many of these objects were the centers of concentration of the socio-cultural life of the population, some buildings have survived to this day. These objects have the status of objects of cultural heritage.

In total, 1 federal OCH, 16 regional OCH and 35 identified OCH are located on the territory of the city of Korolev. In the course of the analysis, objects that are subject to restoration and have prerequisites for involvement in economic life were identified. For the study, the OCH "Estate Lapino - Spasskoye", XIX-XX century., the territory of which is partially located in the territorial zone of integrated sustainable development of the territory (CRT-4) and is currently not used (Figure 1).

![Fig. 1. A fragment of the urban zoning map of the urban district of Korolev, with the allocation of the border of the territory of the Estate Lapino-Spasskoe.](image)

According to the map of the boundaries of zones with special conditions of use of the territory, the territory of the OCH is almost completely located in the protective zone and
partially in the coastal protective strip (Figure 2).

![Map of zones with special conditions of use of the territory of the urban district of Korolev](image)

**Fig. 2.** Fragment of the map of zones with special conditions of use of the territory of the urban district of Korolev, with the allocation of the border of the territory of the Estate Lapino-Spasskoye.

The ensemble belonged to the families of Moscow merchants before the revolution and was used as a residential building. In the Soviet years, two kindergartens were located in the main and residential buildings of the estate. To date, there are two operating kindergartens and 4 low-rise apartment buildings on the territory. The existing objects located on the territory of the estate are shown in Figure 3.

![Objects of cultural heritage](image)

**Objects of cultural heritage**
1. Main house (second half of XIX c.) - now ruins
2. A residential house (turn of the 19th-20th centuries) - now a kindergarten
3. The retaining wall with a large observation deck and a swimming pool, early twentieth century. - now ruins
4. The retaining wall with the Small, 2022 photo observation deck, beginning of the 20th c. - now ruins
5. Landscape Park (fragment), XX - early XX cc. - fragmentary

**Other objects on the territory of the estate**
1. The Children's Garden
2. A group of low-rise apartment buildings

**Fig. 3.** Existing objects on the territory of the Estate Lapino-Spasskoye.

Based on the analysis of the order of the GUKN of the Ministry of Defense [18] and the Ministry of Culture of the Ministry of Defense [19], the composition of cultural heritage objects on the territory of the Estate Lapino-Spasskoye, the mode of use of the territory, objects of protection, the presence of a passport and the existing use of objects was identified (Table 3.1).

**Table 1.** Characteristics of the territory.

<table>
<thead>
<tr>
<th>Title</th>
<th>Existing state</th>
<th>Existing usage</th>
<th>OCH passport</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main House (tue. floor. XIX century)</td>
<td>ruins</td>
<td>absent</td>
<td>absent</td>
</tr>
<tr>
<td>Rabeneck House (1900s)</td>
<td>lost</td>
<td>absent</td>
<td>absent</td>
</tr>
<tr>
<td>Residential building (turn of the XIX-XX centuries)</td>
<td>is used</td>
<td>kindergarten</td>
<td>no data available</td>
</tr>
</tbody>
</table>
Retaining wall with a large observation deck and swimming pool, beginning of the building. XX century.

Retaining wall with a small, photo 2022 viewing platform, beginning. XX century.

Landscape Park (fragment), XX-beginning. XX centuries.

| Retaining wall with a large observation deck and swimming pool, beginning of the building. XX century | ruins | absent | no data available |
| Retaining wall with a small, photo 2022 viewing platform, beginning. XX century | ruins | absent | no data available |
| Landscape Park (fragment), XX-beginning. XX centuries. | fragmentary | absent | no data available |

A full-scale survey of the territory showed the extremely depressing existing condition of most of the estate objects and the territory in general (Table 2).

**Table 2.** Photo of the territory.

<table>
<thead>
<tr>
<th>Photo</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="View of the end of the main house (tue. floor. XIX century) from the side of the Klyazma River. Photos from 2022" /></td>
<td>View of the end of the main house (tue. floor. XIX century) from the side of the Klyazma River. Photos from 2022</td>
</tr>
<tr>
<td><img src="image2" alt="View of the rear facade of the main house (tue. floor. XIX century). Photo of 2022" /></td>
<td>View of the rear facade of the main house (tue. floor. XIX century). Photo of 2022</td>
</tr>
<tr>
<td><img src="image3" alt="View of the residential building (turn of the XIX-XX centuries). Photos from 2022" /></td>
<td>View of the residential building (turn of the XIX-XX centuries). Photos from 2022</td>
</tr>
<tr>
<td><img src="image4" alt="View of the landscape park (fragment), XX-beginning. XX century, main alley. Photos from 2022" /></td>
<td>View of the landscape park (fragment), XX-beginning. XX century, main alley. Photos from 2022</td>
</tr>
</tbody>
</table>
In accordance with the conducted historical and cultural expertise [35], the regime of using the territory of the estate was established. The object of protection of the ensemble of the OCH "Estate Lapino-Spasskoe", XIX-XX centuries." are:

- location of the ensemble of the OCH, its role in the compositional and planning structure of the historically formed territory of the city of Korolev;
- the compositional structure of the ensemble, formed by the beginning. XX century, including objects that provide a joint perception of ensemble: - Main house, XX century.; - Residential house, XIX-XX century.; - Rabenek House, 1900s.; - Retaining wall with a large observation deck and a swimming pool, beginning. XX century.; - Underground wall with a small observation deck, beginning. XX century.; - Peizazhny Park (fragment), XIX - beginning XX century., — dimensions, height and silhouette characteristics of buildings and structures;
- spatial-planning composition, formed by the beginning. XX century, including the historically established functional zoning of the ensemble, including the location of buildings and structures of the main estate in the north-eastern part of the territory and two small estates in the south-western part of the property, as well as the location of the park, the alleys of the main estate, the ratio of landscaped and non-landscaped spaces and plots;
- the ratio of built-up and undeveloped territories of ensemble, closed and open spaces;
- features of the historical relief of the territory of the XIX - beginning. XX centuries of natural and anthropogenic nature, including the preserved relief of the coastal estate territory near the Klyazma River;
- historical views of the ensemble: view from the left bank of the Klyazma River.

Analysis of the requirements of the use regime of the estate territory has shown that the use of OCH for a social object does not contradict any of the requirements.

During the search studies, drawings of the 2nd and 3rd floors of the Main House of the Estate, XIX - beginning. XX in (Figures 4,5).

Fig. 4. Plan of the 2nd floor of the Main House.

Fig. 5. Plan of the 3rd floor of the Main House.

The building of the Main house of the of the Estate Lapino-Spasskoe, in accordance with the public map of Rosreestr, is located on a land plot with cadastral number 50:45:20203:523 with an area of 4,197 sq. m [20].

As a result of the analysis of the data obtained, it can be concluded that the only object that can be adapted for modern use is the main house (XIX century).

The tendency to satisfy the interests of developers in large volumes of housing construction entails negative consequences for the socio-economic sphere of the municipality as a whole. Housing construction leads to population growth and, as a result, to an increase in the burden on the social infrastructure of the city. There is a shortage of social facilities.

According to statistical data, over the last decade, the population of the city of Korolev has grown by more than 20%. Thus, in recent years, the burden on social infrastructure has
increased rapidly, while the city has remained preserved within its territorial borders and can only develop intensively.

According to the general plan of the city of Korolev, the identified deficits in social infrastructure facilities amounted to:

- Outpatient clinics – 1,331 villages/shift;
- Preschool educational organizations – 6,995 places;
- General education organizations – 17,017 places;
- Youth sports schools – 4,276 places;
- Gyms – 11,840 thousand sq. m

The lack of capacity of social facilities is planned to be covered mainly through the reconstruction of existing facilities by expanding useful areas.

In the course of studying the practice of preparing documentation on the planning of the territory in Moscow for the conditions of renovation (integrated development of the territory), it was revealed that the most frequently planned social objects are objects of general and preschool education, health care, sports and multifunctional complexes [2].

Based on the studied material, a list of types of objects has been compiled that it is advisable to consider for the possibility of placement in the OCH. All objects from the list are classified according to 3 criteria. The result is presented in table 3.

Table 3. Criteria for the most planned social facilities.

<table>
<thead>
<tr>
<th>Object</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mandatory presence of a separate territory for the implementation of basic functions</td>
</tr>
<tr>
<td>Pre-school organizations</td>
<td>+</td>
</tr>
<tr>
<td>School</td>
<td>+</td>
</tr>
<tr>
<td>Organization of additional education</td>
<td>-+</td>
</tr>
<tr>
<td>Outpatient clinics</td>
<td>+</td>
</tr>
<tr>
<td>Remises for sports and recreation activities</td>
<td>-+</td>
</tr>
<tr>
<td>Cultural and mass leisure facilities</td>
<td>-</td>
</tr>
<tr>
<td>Administrative buildings</td>
<td>-</td>
</tr>
<tr>
<td>Consumer service companies</td>
<td>-</td>
</tr>
<tr>
<td>Milk kitchen distribution points</td>
<td>-</td>
</tr>
<tr>
<td>Pharmacies</td>
<td>-</td>
</tr>
<tr>
<td>Contact offices</td>
<td>-</td>
</tr>
<tr>
<td>Public security points</td>
<td>-</td>
</tr>
</tbody>
</table>

"+" - the criterion must be met;
"-" - this criterion is optional;
"+-" - possible for a design assignment, but not required to be completed

The initial selection of social infrastructure facilities showed that due to the small area of the premises and their limited number, the main house building cannot be adapted to
accommodate outpatient facilities.

Further, the analysis of the possibility of placing objects from the list in the OCH was consistently carried out, taking into account specific regulatory requirements fixed in specialized codes of rules, sanitary rules and other regulatory documents, as well as economic viability and prerequisites for development in the adjacent territory.

As a result of the analysis, for the development of the educational function in this territory and the creation of a single territory of the educational cluster in the future, it is proposed to place an educational institution of additional education in the building of the OCH.

4 Conclusions

1. The location of a number of OCH in the structure of the city of Korolev, their technical condition, a significant shortage of objects of the social infrastructure of the city confirm the expediency of their inclusion in the boundaries of territories subject to integrated development.
2. During the field study, the accident condition of buildings on the territory of the cultural heritage site "Estate Lapino-Spasskoye, XX-early, XX centuries" was revealed.
3. Analysis of the urban development situation in the adjacent territory revealed the possibility of creating a local center of attraction for the population based on the Lapino-Spasskoye Estate, XX-early, XX centuries.
4. The search for the use of OCH for the implementation of social functions allowed to prove the efficiency of the proposed methodology.
5. For use as a social object, it is possible to adapt the Main house (vt. floor. XIX century.) Estate "Lapino-Spasskoye", XX-beginning, XX centuries.
6. In order to implement design solutions for the adaptation of the examined OCH, it is necessary to restore the destroyed parts and carry out repairs.

In the future, the research is supposed to be associated with complex information modeling of cultural heritage objects based on CIM and BIM technologies.

References

5. B. Plevoets, K. van Cleempoel, WIT Transactions on the Built Environment 118, 155-164 (2011)
8. Y. Li, L. Zhao, J. Huang, A. Law, Built Heritage 5(1), 1-19 (2021)


19. On approval of the subject of protection of the historical and cultural monument "Residential building, rubezh XIX – XX centuries, which is part of the cultural heritage site of regional significance "Estate Lapino-Spasskoe", XIX - beginning. XX (2015)

20. URL: https://pkk.rosreestr.ru/