Safety Criteria of the Historic Ruins

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Abstract. Discusses the causes of destruction and slow recovery of many historical buildings. This report mainly concerns the problems of rural churches which are usually located in remote, little populated areas. As a rule they are gradually destroyed, but are of historical and architectural value and sometimes become centers of revival of Church life. This report provides examples and analysis of some rural churches. Similar demographic problems are characteristic not only for Russia but also for Europe as a whole. Possible ways of solving the problem in the West and in Russia are discussed. It is proposed to introduce in regulatory documents the term "historic ruins". Historical ruins require a special approach to their study and recovery. The system of criteria of a technical condition depending on mechanical safety is considered. The aim of the facility survey is to establish its condition in accordance with safety criteria, as well as specific recommendations for conservation, demolition or technical improvements of individual structural elements or the distribution of places for periodic use for church services. The frequency of monitoring is important. It is noted that the official recognition of the status of the ruins will help preserve many historical monuments.

1. Introduction.
From the beginning of the XX century, mainly in rural areas, a significant group of brick-built gradually destroyed buildings formed mostly rural Orthodox churches [4,5]. Rural temples are historically important to the people, and even those that are in a dilapidated state are the organizing center of the surrounding space and continue to attract visitors.

In addition to geocological and technogenic factors, until the middle of the last century, the destruction of church buildings was caused by historical factors - wars, revolutions, ideological actions. The dwindling rural population lead to the desolate and abandoned state of buildings designed for crowded villages. Some buildings are almost abandoned, others are visited occasionally, and in some rare cases, are slowly recovering.

The problem of desolate temples is typical for Europe as a whole. In Holland, England, Germany it is a problem not only of villages, but also of cities. Several solutions have been implemented adaptation to modern needs, demolition - especially in rural areas, restoration by individual enthusiasts.

The buildings are for sale, and new owners are remodeling them into apartments, restaurants, bars, pubs or shops. For example, Bedford church, closed in 2008, was transformed into a theater and a spacious semi-circular foyer was attached to the historical part of the building. [3].
In the former Houghton-on-Hill village of Norfolk County [2] in the east of England, ancient ruins of a magnificent summer church were restored into a private property in a 22 years process.

Demolishing or a changing the functional purpose of rural churches is inappropriate, since they are historically significant remnants of the ideological actions of the last century, however the mass restoration of empty rural churches is also currently impossible. Leaving abandoned buildings without survey and periodic observation is also dangerous. So how should we deal with these abandoned structures?

In Russia, two processes are occurring simultaneously. In the cities new temples and chapels are constantly being built, and old churches are being restored. In the villages, small chapels are also sometimes built and the old temples are slowly restored. The construction is made of traditional materials - brick and wood. Architects try to follow the traditional style, but these buildings do not replace historical ruins that preserve historical memory.

The restoration of old temples very costly. Their use year-round in full is also impossible. That's why in Russia, many rural churches remain empty (Fig.1).

![Figure 1. Village Guryev-Voskresenskoe. The Church of St. Nicholas the Wonderworker has been in the process of being restored since 2008. At the entrance there is a sign detailing basic information about the church as well as warning about its dangerous condition. Inside there is an area that can be visited safely containing icons.](image)

2. Research.

A solution is the creation of special norms that allow regulators to classify the dilapidated buildings into a separate, special group of buildings with historical and cultural heritage. The main purpose of this group is to preserve historical memory, ensure that these buildings are safe to visit, organize periodic examinations of these buildings, as well as allocate space for church services.

Neither the restoration of all of the building’s original architectural details, no the replacement or reconstruction of portions of the building associated with bearing loads, is not considered. Dismantling object is also not permissible.

The term “preservation of historical memory” - includes a complex of works on photo-fixation, measurements and conservation of ruins, the collection of historical data for the creation of a booklet and recording of the main events on the plate fixed on the structure

The term “security” includes the analysis of structures that can’t be restored, reinforcement of structures or their fragments that can be saved, the implementation of fences.

The powerful walls of rural churches are preserved longer than other structures. However, the buildings are in a post-emergency stable condition, which no longer falls under the category of structures which should be actively maintained. Some of these buildings may well be called historical
ruins, but unlike the ancient ruins, the churches have not lost their religious significance [5]. Sometimes the inhabitants try to revive the old dilapidated churches on their own (Fig. 1), and begin to conduct divine services. The question arises about the seasonal use of temples.

The first step to prevent the complete disappearance of historical buildings in rural churches should be the recognition of the existence of historical ruins, the creation of regulations that regulate the rules for their conservation and, in some cases, the allocation of times for use. Thus, it is necessary to formulate a system of criteria on the basis of which normative documents can be created.

A structure can be classified ruined, if a significant part of the structures is destroyed, it has not been operated for a long time, and a visit to the surviving part can be dangerous.

Ruined structures can be divided into three groups:
- not subject to restoration (Fig. 2); - structures that can partially be restored (Fig. 3), - structures that should be restored, but the amount of restoration is not feasible to complete (Fig. 1).

The Church of the icon «Joy of All Who Sorrow» was built in honor of the resistance from the Lithuanian invasion (Fig. 2). There is not subject to restoration but the historical value of the fragment of the church of the XVII century is very great.

Figure 2. The surviving ruins now do not pose a serious danger, but they themselves require conservative measures to protect against complete extinction. The destruction of the masonry is provoked by the root system of trees.

Figure 3. St. Nicholas Church.. The place (aisle) that people want to restore.
Analysis of the ruined structures should be made from the point of view of their safety. The definition of integrated and mechanical safety are given in State standard 31937-2011 Buildings and constructions. Rules of inspection and monitoring of the technical condition. The definition of "ruined condition" corresponds to the concept of mechanical safety: "the state of building structures and the foundation of a building or structure, in which there is no unacceptable risk associated with causing harm to the life or health of citizens ... to the environment, life and health of animals and plants due to destruction or loss of stability buildings, structures or parts thereof ".

The following scale of four status categories is proposed.

**Safe**, in which the ruins are not dangerous and the load-carrying capacity of structures, taking into account the effect of existing defects and damages, is known. The ruins of the St. Nicholas Church (1846) in the village of Tyutchevo consist of 2 volumes: a four-legged one, and the base of the bell tower (Fig. 4).

![Figure 4](image1.png)

**Figure 4.** In the foreground, a newly constructed apse. In the background there are the ruins of the bell tower.

The quadrilateral and the apse are covered with a roof.

**Locally dangerous** in which the building as a whole is safe, but there is a risk for people to stay in a certain localized area, meaning it is necessary to carry out safety measures and reinforce structures. Locally dangerous state of structures can arise not only with slow destruction (Fig. 4), but also with slow restoration of the ruined object (Fig. 5);

Locally dangerous areas require mandatory fencing (Fig. 5).

![Figure 5](image2.png)

**Figure 5.** Tower of the Kremlin, 1531 year, in Kolomna, a local danger - not fenced off from the tourist’s wall.
Locally safe, at which there is no danger of sudden destruction of certain local parts of the building volume. Visiting the building is possible with consideration of its condition and a safe path to and from the building. Dangerous sections of the volume should be fenced, and inaccessible to visit. A fragment of the preserved porch of the church of the XVII century is locally safe (Fig.6).

![Figure 6. It should be safe not only the porch, but also the approach to it.](image)

Dangerous, in which a part of the building’s structure or the building as a whole does not meet the requirements of mechanical safety (Fig.7). For example, the ruins of a beautiful church built in the late 19th century in the village of Osovo in the Ryazan Region. Residents want to restore at least one aisle (Fig.3) however the foundation of the column of the portico is destroyed. Strengthening of the portico and installation of fencing and constant monitoring of the condition are required as soon as possible. Strengthening must be carried out, even if changes in the shape of the colonnade are necessary. Approaching is dangerous.

![Figure 7. St. Nicholas Church in the village. Exquisite porticoes and foundations of columns are destroyed. On the right there is an aisle that the residents want to restore for religious purposes.](image)
As a rule, surveying of structures is carried out in two stages: a preliminary and detailed survey. The huge number of historic ruins makes preliminary survey particularly important. At this stage, the category of the state of the object is determined, photographic documentation is carried out and safety actions are recommended (guards, hazard warning). At the same time, the necessary frequency and composition of the monitoring is recommended. Recommendations should be specified at the stage of detailed survey and change with restoration of the monument. If the temple is supposed to be restored completely, the work could take decades and recommendations on monitoring should take into account this circumstance. Sometimes the actions to ensure security and reinforce the design should be taken immediately (Fig. 7).

A detailed survey includes all standard works. Its task is to give recommendations on the safety of structures that can be retained and for the dismantling of structures, the preservation of which is currently impossible. Particular attention is required to measuring work and drawings. The solution of these problems requires considerably less expenses than works on the restoration of architectural monuments.

3. Conclusion.
This proposed approach and the scale of criteria corresponds to the task of preserving the disappearing monuments of history, leaving for the future a solution of tasks that are beyond the capacity at present. With significant cost savings, this approach will allow to monitor the condition of the facilities and regulate the repair work. At present, work is under way to create departmental norms.

References
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