

## **“KARAĐORĐEV DOM” IN RAČA: TAKING THE FIRST STEPS OF CULTURAL PROPERTY REHABILITATION PROCESS**

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**Elena Vasić Petrović**

DEarhitektura Niš, Serbia

**Abstract.** *"Karađorđev dom" in Rača, a monumental building, protected as a cultural monument, whose construction was completed in 1933, after many years of use and several changes of purpose, has been abandoned since 2016 and is now awaiting its first renovation. The rehabilitation project, started on the initiative of the municipality of Rača, envisages numerous activities in order to prevent its further degradation and to reconsider the possibilities for its revival, adequate presentation and permanent protection. The paper presents the first concrete steps realized during 2020.*

**Key words:** *Karađorđe, Rača, rehabilitation, conservation.*

### 1. INTRODUCTION

"Karađorđev dom" in Rača was established in the period from 1929 to 1933, as a home for neglected children and orphans of the "Moravska banovina" authority. It is located in the area of the wider city center, on the corner of Queen Marija and Karađorđeva streets.

"Karađorđev dom" is enlisted as a monument of culture since 1988 ([https://nasledje.gov.rs/index.cfm/spomenici/pregled\\_spomenika?spomenik\\_id=45181](https://nasledje.gov.rs/index.cfm/spomenici/pregled_spomenika?spomenik_id=45181)).

The building's base is rectangular, with protruding towers flanking all four corners. The front façade, whose projection dominates the main entrance part together with the monumental staircase and porch, was designed in the same manner (see Fig.1.).

Apart from its original purpose, it also served as an educational and school building for many years, and the last tenants were displaced persons from Kosovo and Metohija, after whose eviction it was left to decay.

"Karađorđev dom" and its courtyard are presently in a very poor condition, although it can be said that the period in which the general degradation occurred, after the last users

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**Corresponding author:** Elena Vasić-Petrović

DE arhitektura Niš, TC Kalča, I sprat, lok. CI-87, 18000 Niš Serbia

E-mail: [elenavasic@gmail.com](mailto:elenavasic@gmail.com)

left, had a much greater negative and almost devastating effect on the building itself, than all previous years of active existence.

In 2020 the local government of the Municipality of Rača initiated the rehabilitation project, supported by the Serbian government and the job has been assigned to “DEarhitektura” (<https://dearhitektura.com/en/karadorde-mansion-conservation-and-restoration-works-raca/>), a company based in Niš and to the author of this article as project team leader. The first step in project development was defined and executed in order to prevent further degradation of the building (Project for conservation and restoration works on the roof and all façades and for reconstruction of the lightning arrester system). Additional research and studies were completed at the same time to help defining the priorities and further rehabilitation processes that must be done concerning the cultural property and its surroundings (ICOMOS, 2003).

## 2. HISTORY OF THE BUILDING

“Karadordev dom” was built in Šumadija in Rača in the immediate vicinity of the village of Viševac, where Karadorđe, the leader of the first Serbian uprising, was born. Although the idea of its establishment appeared immediately after the World War I, it will be realized much later. The building is compound of different architectural ideas and was erected under the supervision of several architects, given that the original designs from architect Dragiša Brašovan (A.Kadijević, 1989), have undergone changes during the time.

In 1932, „Karadordev dom” already became a humanitarian educational institution with agricultural practice for homeless children of the Danube Banovina of the Kingdom of Yugoslavia, aged 6 to 16. It was ceremoniously opened and consecrated, a year later, on December 8, 1933, on the day St. Clement of Rila (J.Milovanović, 2016).



**Fig. 1** “Karadordev dom”, a view from Karadorđeva street, the postcard from the period of construction, URL: <http://slikeiprilike.com/tag/raca-kragujevacka/> (March 20, 2021)

Between 1941 and 1946, the building was out of order, and then started working as high school – Gymnasium, which was changed again in 1957 when Agricultural school was formed. From 1960 to 1997 the elementary school named “Karađorđe” used the premises of “Karađorđev dom” and after the building was left to decay (Ž. Andrejić, 2017). From 1999 to 2016 it was again “home”, now for people from Kosovo and Metohija as they were refugees due to the armed conflict in this southern Serbian province.

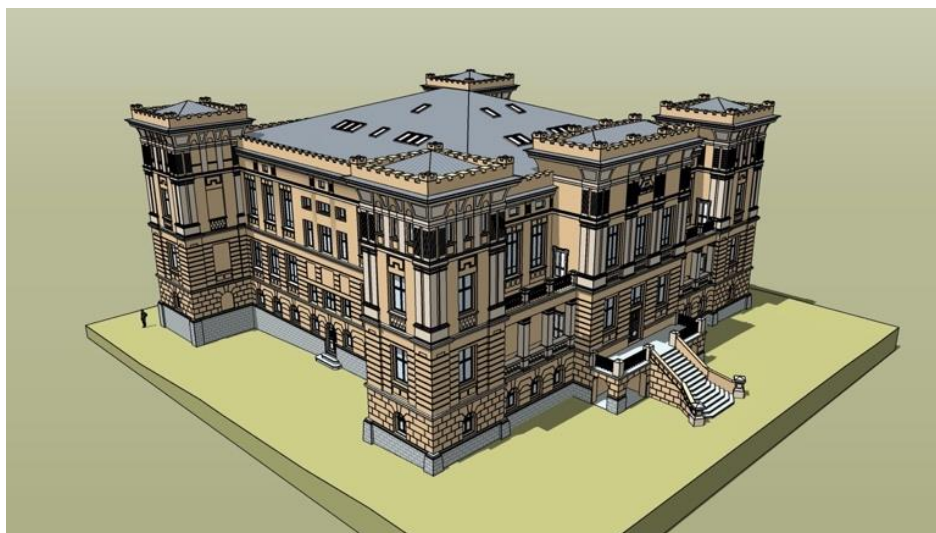
### 3. REHABILITATION PROJECT

The Rehabilitation project has defined the first stage as the need for the reconstruction of the facade and the roof, replacement of carpentry and adaptation of the existing lighting installation, in order with the prepared project documentation, which will enable the first phase of renovation of the building, but also the improvement of the general condition of its immediate environment.

Detailed technical recording and analysis of all parts of the building and determination of its current condition, is shown through Study "A" - Report on the inspection of the building, as well as the need for additional analysis of materials, which is the subject of Study „B“.

Also, in the final phase of drafting the project the topic of its development possibilities was covered in detail, through Study "C", which contains a proposal of the program of works that need to be performed in order to make the building the tourist amenity.

The design specifications of the investor envisage the development of a detailed 3d model of the building, which was completed in combination of geodetic measurements, photogrammetry and additional traditional technical recording *in-situ* (see Fig.2).



**Fig. 2** “Karađorđev dom”, 3D model, author: D.R.Vranić (December 2020)

#### 4. DETAIL DESCRIPTION OF THE BUILDING

"Karadorđev dom" is located at KP 332/1, KO Rača, which is positioned on the corner of Queen Marija and Karadorđeva streets and is owned by the municipality of Rača.

The subject cadastral parcel makes half of the block in which it is located and has a total area of 6,183.00 m<sup>2</sup>, while the building itself occupies 969.00 m<sup>2</sup>. The rest of the area, which is not under the building, is occupied by another recently added facility, which was built in the immediate vicinity of "Karadorđev dom" and another smaller building on the south side of the plot. These two mentioned buildings have no historical or architectural values, while the free areas have a very high potential for maximum utilization and activation, while retaining the basic characteristics - open park space, to which recreational areas and spaces for children to play and stay can be added, with proper and efficient organization and demarcation in accordance with the future purpose of the facility itself and its individual parts. Also, urban planning of certain parts, through paving and zoning, smaller or larger squares can be formed, for various purposes, which are missing generally in the surrounding urban space (E.V.Petrović, 2020c).

The courtyard can be accessed from both streets, through two gates, small one from the main street is pedestrian and a larger one is for vehicles. Sidewalks, access surfaces and plateaus are made of concrete. All other areas are grassed and contain high and medium greenery. The plot is fenced to the streets and the terrain is slightly sloping to the south.

The building is rectangular with the main entrance and monumental staircase, on the northwest façade (see Fig.3). The remaining façades also have entrances, so there is a total of four in the entire building and they are all at ground level (originally raised by 3 steps), except the main one, which is located on the balcony, which is a semi-level between the basement and ground floor.



**Fig. 3** "Karadorđev dom", a view from Karadorđeva street (left), a view from the backyard (right), author: E.V.Petrović (November 2020)

The building contains a basement (partially illuminated by natural light), then a ground floor, first floor and attic space, which is not intended for use, but can be accessed by an auxiliary staircase, which extends through all floors, to the basement. Opposite to this staircase, which is positioned in the central part on the northwest side, there is the main staircase, which has no access to the attic space. All towers, as well as the protruding part above the main entrance, have another additional level, below their independent roof structures, which are accessed from the attic space. The main roof structure, above the central body, is four-pitched, made of wood and completely covered with metal panels.

The whole building, with its external appearance, is associated with the fortification, and contains elements of different architectural styles (Neoclassicism, Neo-renaissance, Eclecticism, Academism, etc.) (see Fig.3).

The facades of the building are characterized by strict symmetry, linearity and horizontal zoning, rhythmic repetition and arrangement of certain functional and decorative elements. The richness of decorative plastic is reflected in the multitude of applied geometric shapes and figures, which forms clearly differentiated zones between the cordon wreaths. The first, lower zone, is finished rustically, with large stone blocks and ends with a cordon wreath also of profiled stone elements, while all other higher zones are made with a flat finish in mortar and are painted in the same color, without emphasizing details. All the walls, except in the first zone, are built of solid brick.

By probing the facade surfaces and their detailed inspection, it was determined that the original color was "ocher" (visible in almost original form in the niches), while the entire northeast facade, as well as the associated towers, on all sides, were painted at some point in green color by "spraying", in the so-called "*hirofa*" method.

All facade carpentry is made of wood. All the windows were painted in oil paint in an "ivory" tone. All entrance doors are also wooden, with glazed fields in combination with decorative elements made of wrought iron and are painted in different shades of brown.

The building contains elements of electrical installations and lightning rods, which are visible on the facades.

The interior of the facility is largely neglected, and some parts have been adjusted to the purpose it had from 1999 to 2016, which is to accommodate displaced persons from Kosovo and Metohija.

On the entrance facade, to the right of the door, a memorial plaque with a relief and an inscription, made of bronze, was placed in 1998, dedicated to the anniversary of the breakthrough of the Salonika front.

The building has suffered and continues to suffer a very aggressive and negative effect from atmospheric water and moisture, primarily due to very poorly performed repair interventions on the roof, sheet metal cladding and damage to the gutters. Although based on older photographs, it can be seen that similar damage was present before, due to the characteristic problematic solution of collecting and distributing atmospheric water from the roof, behind the superstructures and penetrations towards the gutters, positioned on the facades. All façade planes, the roof construction, but also the interior of individual rooms, as well as the associated façade carpentry, are directly exposed to these negative influences.

Due to the complete absence of maintenance, great damage was inflicted on all other parts, which have a protruding position (entrance staircase, balcony, terraces), together with all its associated elements.

In addition to local destabilization and slight deformation of certain elements in the exterior of the building (entrance staircase, porch pillars, entrance stair railing, decorative elements of facade planes, attic cornice, etc.), weakened wooden elements of the roof structure and burning traces in the attic space of one of the towers, no other deformation or problems were noticed, which would indicate static destabilization. The inspection was carried out in all available parts of the building, outside and inside, including the roof planes. The basement rooms were not available for inspection. Of the visible, significant damage to the facade, it should be mentioned here that there is a larger crack on the northwest facade in the upper right corner, which extends from the attic zone, obliquely downwards, towards the corner tower (E.V.Petrović, 2020a).

### 5. DEGRADATION SURVEY AND MAPPING AND PROPOSED TECHNICAL MEASURES

The façades of "Karadžorđev dom" in Rača are exposed to the negative influence of water and moisture. The key problem noticed during the detailed inspection of the building and all facade planes is the negative effect of atmospheric water.

Water penetration from the roof of the building: the most problematic are the gutters, collecting and draining water from the roof of the building. Namely, the gutter verticals were incorrectly constructed during the last reconstruction, and in the meantime, they suffered additional damage, so that the water flows directly to the walls of the building. There are practically no gutter horizontals on the building, and the elements that should take over the role of bays and horizontal drains do not exist in all places, where according to the rules, they should be. In addition to the above, all joints and penetrations through facade planes, as well as sheet metal cladding, are also problematic.

Penetration of water and moisture from the surrounding terrain: to a much lesser extent, but certainly not negligible, there is also the impact of water and moisture on the façades, like the stone plinth, stairs, and other associated elements in the area immediately above the ground. The connection between the existing sidewalks and the building is largely damaged, large cracks have been formed from which low, bushy and high vegetation grows. In some parts, the building itself was buried up to the level of the first step at the entrance doors, due to the construction of a concrete plateau, on the east side, or due to soil deposits, on the southwest and northwest side (E.V.Petrović, 2020a).



**Fig. 4** "Karadžorđev dom", main façade (northeast) deterioration mapping, author: E.V.Petrović (November 2020)

Insufficient maintenance of protruding parts of the building and façades: due to the long-term absence of proper use, parts of the building that protrude in relation to the basic façade plane, as well as terraces and entrance balcony, suffer constant negative effects of water, frost, and other weather influences. The resulting damage progressively increases in the cycles of freezing and thawing of water, large temperature fluctuations etc. (see Fig.4).

The main entrance is positioned centrally and additionally protrudes in relation to the northeast façade and the central projection. It consists of a balcony, which is finished with a "terrazzo" lining, and along the perimeter with the profiled stone blocks. It is elevated in relation to the elevation of the terrain and is located on a kind of semi-level between it and the elevation of the ground floor of the building. Below the balcony there are laterally covered



open vestibules from which one enters the central closed part in the width of the staircase. The balcony railing consists of solid brick masonry pillars, between which is a wrought iron railing. The walls are made of solid brick and stone in the lower zone and are plastered on both sides in the brick part and treated in the same way as the rest of the facades in those zones. The staircase, also centrally placed, rests on solid brick walls. The stair treads are made of profiled stone blocks and are composed of segments (2 or 3 depending on the width). All masonry parts are in poor condition, certain parts need to be completely rebuilt. All mortar coatings must be removed and re-finished in the same manner as original. The “terrazzo” lining is in poor condition, so it also needs to be repaired. The wrought iron fence requires restoration, as do all the stone blocks (stair treads and balcony gutters).

The façade plinth in all parts of the building (Zone I), except the entrance staircase, is built in the same way, with stone blocks, with a profiled wreath at the top. The stone is of very high quality and rustically processed, and apart from surface damage and a few isolated cases of structural degradation, there are no major problems that need to be solved. Surface biodegradation (mosses, lichens, microorganisms, etc.) prevails, which developed due to the large amount of water flowing from the facade, as well as in the lower zones, where water comes from the ground. Also, graffiti can be seen on some parts. In this zone, there are stairs at the auxiliary entrances, also made of stone blocks, so beside all other planned work it is necessary to perform their conservation, restoration, stabilization, and replacement of the missing parts.

Zones of facade surfaces treated with mortar (II, III, IV): depending on the amount of water that flows through the facade and penetrates through the walls, different types of damage can be noticed on the facade surfaces. In principle, zone II has the least damage because it is the lowest and the least water from the roof, gutters, etc. reaches it. The amount of damage increases along with the increase in height. We distinguish two types of damage - *large*, which requires complete removal of all plaster coatings, occasional repair of the substrate and walls and re-execution of all elements according to the original and - *small*, which are mostly on the surface and require only removal of paint layers, repair of small damage, such as thin mesh cracks, followed by finishing and painting. Also, all cordon wreaths, protruding elements, such as windowsills, window openings and doors, are largely damaged and in most cases must be rebuilt completely according to the original elements. In addition, the replacement of facade joinery will require work on all elements that are in contact with it, because they will have to be dismantled and removed.

Attic zone of facade surfaces treated with mortar (V) have the greatest damage present. Most of the plaster surfaces have been washed away or degraded to such an extent that they must be completely removed and rebuilt. Also, surfaces and masonry parts require interventions in terms of repair and restoration.

In the area VI (superstructure) we distinguish two types of damage - mostly superficial plaster damages and structural, in combination with the previous one, where it is mandatory to rebuild parts or whole elements.

When it comes to facades, it should be said that all gutters and sheet metal edging are in poor condition and that they need to be completely replaced with new ones, also, it is necessary to adapt the existing lightning protection installation, because it is in poor condition. In addition, the remains of electrical installations should be removed, which are attached to the facade planes, because they are worn out and out of function (E.V. Petrović, 2020a).

Facade joinery consists of several types of windows and doors (entrance and balcony) and is all made of wood. In principle, all windows are in very poor condition and cannot be restored or repaired, so they need to be replaced. The wood material is rotten, many

parts and elements are missing. When it comes to doors, all entrances are in relatively good condition, when it comes to the structure and main parts, but they lack certain elements, they have added parts, they have undergone changes, so they will be preserved and restored, while the balcony will be replaced new.

Special attention is paid to the roof structure, where it is estimated that 100% of the roof planking, 80% of the rafters and 40% of the rest of the supporting structure must be replaced (see Fig.5). It is made entirely of wood and consists of a central part and independent roof structures in the towers and above the protruding front part of the building, so there are five in total. All roofs are hipped, covered with metal panels. Roof constructions and roof planes are positioned behind the superstructures, so that in general the construction of such roof created a potential problem for a period in which there is no continuous maintenance or as in this case for a period in which there is a complete absence.

This installation caused great damage to the façades and in some internal parts of the building, and the fact that the last reconstruction of the roof was somewhat clumsily and carelessly carried out contributed to a large part of the roof structure itself suffering damage (see Fig 5).



**Fig. 5** “Karađorđev dom”, interior of the attic (left), damage caused by inappropriate roof reconstruction (right) author: E.V.Petrović (November 2020)



**Fig. 6** “Karađorđev dom”, “pull-off” test results (test No4)-left, test results (test No1)-right, author: E.V.Petrović (November 2020)



## 6. MATERIAL TESTING

Based on a detailed analysis of all building structures of “Karadordev dom” - current condition, mapping of negative impacts and types of damage, and implementation of testing and research procedures, which are documented and adequately transferred to technical - graphic, written and photo documentation, methodological approaches and types are defined, as well as conservation and restoration procedures and the need for additional testing of material.

Due to the great damage to the facades, both the plaster surfaces and the masonry structures themselves, we did the following:

- *"pull-off"* test on plastered surfaces, which is performed in situ: the main reason for this type of test is to determine the degree of damage to the plaster on certain parts of the façade, and to determine the surfaces on which the complete removal of the layers of material will be done, and
- testing of physical and mechanical characteristics of bricks (M.Muravljev, 2001), which was performed in laboratory conditions; all walls that have been exposed to water and moisture for many years, in addition to problems with the loss of surface material (mortar), have obvious problems with the effect of the same negative factors on the flushing of joints and binder which could affect the properties of brick itself, as the main building material; we have expected that based on the results of this test, we will be able to determine to what extent the brick could have been damaged in the mentioned processes and whether it requires some kind of intervention, in order to improve its properties.

The *"pull-off"* test is a method for determining the physical properties of a material on site and is generally used to show the degree of bonding of a particular material to the substrate and to determine its surface tensile strength. In our case, we examined the bonding of the plaster on the outside of the walls, to the brick base, of which the masonry structures themselves are made. The basic idea was to determine the condition of the plaster in different zones and in different positions, in order to define the conservation-restoration approach, with the aim of retaining the original materials as much as possible in case they are healthy and preserved. Testing was performed at 3 positions on the northeast façade and another 2 on the southeast façade, in zones II, III and IV.

The results of the tests showed that the mortar used for plastering of the façades was extremely durable. Only one, out of four test zones, was in bad condition and that the entire mortar layer must be removed there (see Fig.6).

Physical and mechanical characteristics of bricks are defined in this case by a method that includes *in-situ* sampling of materials and laboratory testing. Samples were taken from the place where the masonry structure was degraded to such an extent that no additional destruction was needed, but a destabilized piece of masonry structure (bricks connected in places with mortar) was simply removed by simple lifting and transport to the laboratory. Laboratory tests were performed at the Faculty of Civil Engineering and Architecture, University of Niš (E.V. Petrović, 2020b).

The results showed that the bricks are of satisfactory quality and that the planned works and interventions can be carried out.

## 6. CONCLUSION

There are three dominant factors that set the “Karadorđev dom” building apart from others and give it a special value:

1. A very strong connection with the character and life of Karadorđe (which is generally a feature of the wider area of Rača, including the place of his birth, which is in the immediate vicinity), and then with the royal dynasty of Karadorđević.

2. The nobility of Karadorđević family and Queen Maria, from whose fund the construction was done but also the selflessness of the Serbian people, who helped the building of a home for orphans after the Great War, although they were already bearing on their tormented shoulders all the weight and magnitude of the destruction that preceded the war years behind them.

3. Symbolism and monumentality of the architecture of the building itself, which was located almost a hundred years ago on the outskirts of a town in the heart of Serbia (E.V. Petrović, 2020c).

When we observe this facility in real time and space, it still has the same features, regardless of its current neglected condition, and therefore deserves a truly comprehensive and continuous care and constant presence of users and guardians.

"Karadorđev dom" currently has a total usable area of about 2,907.00 m<sup>2</sup>, and if you add a very attractive cover area, you can get a total area of about 3,876.00 m<sup>2</sup>, which provides many opportunities for different purposes. The building consists of very representative spaces on the ground floor and first floor, including large central halls and a ceremonial hall on the first floor, as well as spaces in the basement, which can also be activated and used in various ways.

Analyzed materials have shown that the bricks used to build the building have good characteristics, as well as that e.g., the existing load-bearing walls of the building can receive loads from the new floor structure between the first floor and the attic, in case the owners and users decide to activate this space.

The attic part of "Karadorđev dom" is the highest point in the area and by forming a gallery in this part, you can get an excellent lookout, which is another reason for its use.

Also, it is very important to note that the building has a total of 4 entrances, as well as one auxiliary - economic, below the main entrance staircase, as well as two staircases in the interior, one of which leads to the attic space. This means that the various functions of smart planning can be completely separated, and that even a variant in which a public-private partnership would take place can be quite a solid survivable model.

When intervening in the interior, especially in representative parts, special care should be taken to cancel all subsequent and harmful interventions and to return the premises to their original volume and appearance, while adjusting certain details to modern needs and new purpose (E.V. Petrović, 2020c).

By implementing the reconstruction Project and the ideas and results presented in the accompanying Studies, the Municipality of Rača will have a great chance to preserve their main public building and furthermore to present it to the public in the best light (EUROPEAN COMMISSION, 2018.).

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### **„KARADORĐEV DOM“ U RAČI: PRVI KORACI U PROCESU REHABILITACIJE KULTURNOG DOBRA**

*„Karadorđev dom“ u Rači, monumentalna građevina, zaštićena kao spomenik kulture, čija je izgradnja završena 1933. godine, nakon dugogodišnje upotrebe i više promena namena, napušten je od 2016. i sada čeka svoju prvu obnovu. Projekat rehabilitacije, započet na inicijativu opštine Rača, predviđa brojne aktivnosti u cilju sprečavanja njegovog daljeg probadanja i preispitivanja mogućnosti za njegovu ponovno oživljavanje, adekvatnu prezentaciju i trajnu zaštitu. U radu su prikazani prvi konkretni koraci realizovani u toku 2020. godine.*

Ključne reči: *Karadorđe, Rača, rehabilitacija, konzervacija*