FEASIBILITY STUDY OF CONNECTING ADJACENT AND INSUFFICIENTLY EXPLORED CAVES IN A SINGLE TOURIST ROUTE AND INCLUDING THE VISITOR CENTER "CERJE CAVE" INTO A TOURIST OFFER

Project: "Increasing the tourist information services in the CBC region", Project No. CB007.1.11.268, Subsidy Contract No. RD-02-29-169/13.06.2017 under Interreg-IPA "Bulgaria – Serbia" 2007-2014 Programme

Content:

INTRODUCTION

The key concept of protection, development, regulation and management of natural values is the preservation of the ambient space, the preservation of hydrological quality and the underground values of speleological objects from the effects of negative factors, but also enabling natural activities, as well as monitoring the changes both of the external and the internal environment factors and proposing measures for purpose of the listed values preservation.

Reasons for building the visitor center in the Cerje Cave

It is quite rational to initiate building the Visitor Center "Cerjanska cave" at the site of a very important monument of nature such as the Cerje Cave. However, it should be pointed out that the additional motive for its construction is the fact that the previous activities related to the tourist offer, undertaken by the manager of the protected area, the Public Company Directorate for Construction of the city of Niš, did not give expected results.

In the previous period, mainly the promotional visits (for representatives of media, local self-government…), entrances of researchers and regulatory visits were organized.

Due to limited capacities, the manager tried to increase the attendance rate by signing the Agreement on business and technical cooperation and hiring professional organizations dealing with organizing tourist attraction visits.

However, this has not given any expected results as well, and obviously there is a lack of adequate space in which the potential of this monument of nature could be presented to visitors.

The answer to the question whether the construction of such a space (visitor center) would contribute to bringing the Cerje Cave closer to visitors, will be given through the realization of this project.

Sustainable Management

The feasibility study shall assess the possibility for success of the construction project of the visitor center by taking into account the current situation, processes in the immediate and wider environment, technical and technological factors, business and organizational factors, potential revenues and expenditures.

Sustainable management of the visitor center “Cerje Cave” should be based on the following principles:

- providing an attractive approach to future generations,
- ensuring the quality of life of the wider community by programs and services,
- influencing the collaboration among the public sector, non-governmental organizations, local community and private sector by program activities,

- ensuring sustainable utilization of space by dynamic management plans.

The feasibility study is based on a previously made SWOT analysis, available statistical and other data.

ADMINISTRATIVE INFORMATION ABOUT NATURAL MONUMENT "CERJE CAVE"

Position

By the Decree on the Protection of Natural Monument "Cerje Cave" ("Official Gazette of RS" No.5 / 1998), it is confirmed that the natural monument "Cerje Cave" shall include the following objects:

A – Chasm cave "Provalija"

B– Abyss "Cerjanska propast"

C – Occasional syphon hot spring in Kravlje

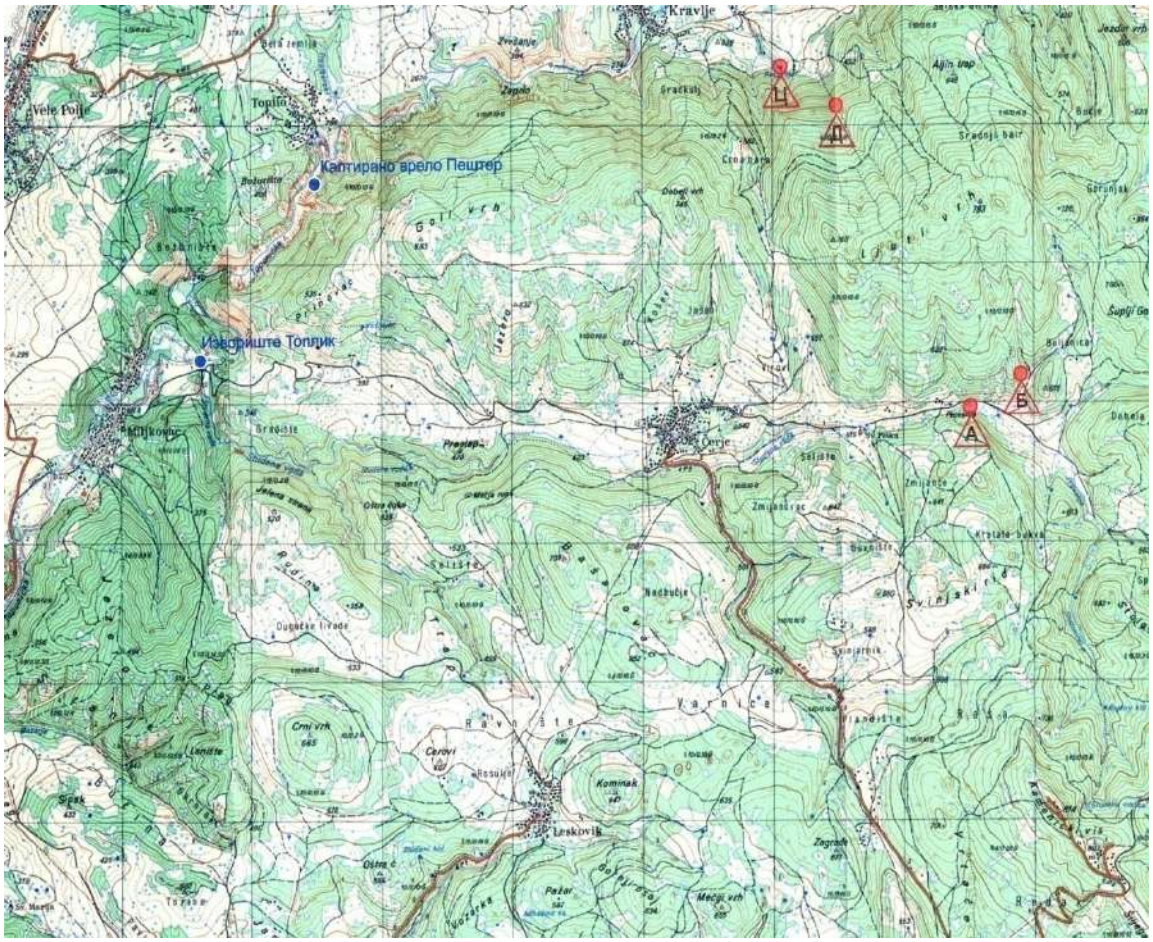
D – Karst cave above the syphon hot spring

Cerje Cave represents a protected area of exceptional importance and is classified in the 1st category of protection as a monument of nature.

The protected area surface is 63,96,89ha, whereas 60,44,56ha are private and 3,52,33ha are public property, and it spreads on the territories of the city municipalities Pantelej and Crveni Krst. The 2nd degree protection regime has been established in the protected area of the natural monument "Cerje Cave".

The location of the visitor center "Cerje Cave" is such that it lays on the border of the speleological object A (Chasm cave "Provalija") from the north-west side.

It is located on the cadastral parcels no. 1316/3, 1315/2, 1312/2, 1311/2 and 6715/2 of the Cadastral Municipality Cerje and according to the Regulatory Road Plan from Cerje to Cerje Cave and the Cerje Cave complex it belongs to the land planned for the construction of the Visitor Center "Cerje Cave". The total area of the building plot is 1931m^2.



Picture 1. Location map of the natural monument "Cerje cave"

Geographical position

The Cerje Cave system is located on the northern Kalafat Hill in eastern Serbia, north from Niš, in the area of cadastral municipalities Cerje (City Municipality Pantelej) and Kravlje (City Municipality Crveni Krst). Speleological objects of the Cerje system are formed in the limestone of Ljuti vrh (784 m). The easiest way to reach the Cerje Cave is from Niš (12 km) through Kamenica and Cerje. Moving 2 km towards east, within the chasm form of the underground river Provalija, there are entrances to the cave Provalija and Meča dupka. Cerje chasm and Pešter in Pljočak are situated northeast, about 550 m away from the entrance to Provalija, in the basin of the underground river Beljanica, which, before the formation of karst, was the right tributary of Provalija.

Cerje can also be reached from the village Miljkovac in the valley of the Toponica River by a narrow asphalt road.

The easiest way to reach Kravlje is from the old road to Aleksinac from Gornja Toponica, along the valley of the Toponica River, then to the left before Miljkovac and to the right in Vele Polje on the road to the Topilo Spa and Kravlje. There is also a road north of Gornja Toponica directly from the road to Aleksinac towards the village of Vele Polje. Furthermore, Kravlje can be reached from Svrljig via Popšica. From the Kravlje graveyard, following the dirt-road or the

path along the backwater of the Gornje Kravlje hot spring, one can reach the hot spring and submerged siphon object of Pećurina. Kravlje cave is located southeast from the hot spring on the northern slope of Ljuti vrh. The basic landscape units of the northern Kalafat Hill, from north to south, are the segment of the Morava River basin of Aleksinac, then the valley of the Toponica River, the limestone lumps Ljuti vrh, where the underground canals of the Cerje system and the Cerje valley (where the village with the same name is situated) are formed. The main watercourse of this area is the Toponica River, the right direct tributary of the South Morava River. The underground waters of Cerje Cave are in its water catchment area.

Kalafat (839 m) is a mountain morphostructure which is, by the mountain pass Gramada (500m), connected with the Svrljig mountain within the Carpatho-Balkanides of eastern Serbia. West from Kalafat there is a spacious valley of the South Morava where the finger-shaped part of Kalafat near Gornja Toponica on the Mezgraja narrowing is drawn in.

History of preservation

First explorations of the natural monument "Cerje Cave" were carried out in 1955 and then, by the Decision of the Institute for Nature Conservation and Scientific Studies, number 330 from November 2nd, 1955, first conservation regime for the objects named Propala Cave and Mala Propala Cave was introduced.

In the period from 1970 until 1978 the Speleological section of the Mountaineering Association of Belgrade carried out the research of the Cerje Cave as following:

- in October 1970 the exploration started
- in August 1971 detailed scanning of cave canals, chasm and abyss "Cerjanska propast" was performed by the semi-instrumental method
- in May 1975 karst cave above the hot spring near the village Kravlje was explored to the depth of 128m
- in May 1976 three dives were performed in the submerged syphon at the karst spring cave south-east from the village Kravlje to a depth of 15m.

The results of this research were published in 1982 by the Speleological section from Belgrade within the material "Results of the previous research with the proposal for further measures and tasks on the valorization of Niš Cerje Cave".

In 1978, on the basis of the conducted research, the Municipal Assembly Niš brought the Decision on preservation of the Cerje Cave (No. 020-156 / 78 from July 11th, 1978, Inter-municipal Official Journal No. 24 / 78). During the same year, due to its exceptional characteristics, the Republic Institute for Nature Preservation brought the Decision in compliance with the Law on Nature Conservation and placed "Cerje Cave" area of 30,0558 ha under protection.

In August and September 1979, the Aleksinac Mines Enterprise broke through the entrance canal of the cave under the supervision of the Speleological Section from Belgrade.

In 1996, the institute for Nature Preservation of Serbia submitted the proposal for the protection of the natural resource "Cerje Cave" as a Natural Monument. Based on this proposal the Government placed the Natural Monument "Cerje Cave" under protection on February 27th, 1998.

DESCRIPTION AND ASSESSMENT OF THE CURRENT SITUATION

Existing values

Due to diverse natural forms and their mutual relationship, they represent the basis for tourist evaluation of the protected area of the "Cerje Cave" itself and the leaning area of Kamenicki vis and Topilo spa as well. It is not only the originality that contributes to the evaluation of the space, but also the composition of the landscape, especially when it appears in an unusual form, which can not be often encountered in nature. Therefore, such forms relate both to the picturesque terrain, and to all other qualities, such as color, light and visual presentation.

Contrary to the effects that a person could experience on a daily basis in an urbanized environment, this area provides great opportunities for leisure, recovery and recreation, and for those reasons the development of this area would be justified.

The terrain is vertically divided, it is undulated and occurs in irregular forms and combinations, which improves the functional and aesthetic component of the space. Such terrain forms, as spatial units with specific and unique characteristics, require a different approach, possibility of use and the perspective of this area.

Due to heterogeneous geological composition, as well as the hydrological and climate characteristics, special forms of karst phenomena are manifested in this area and they represent the following natural values:

- richness, diversity of form, color, composition of cave jewels in forms of stalactites, stalagmites, ornate flowstones, wavy folds, cave canals, crystal flowers, helixites, cave straws and other forms
- monumentality of cave canals and chambers (length from 100m, width 20-35m and height up to 40m)
- The area of Cerje Cave itself, Kamenički vis and the surrounding area are relatively poorly explored. Therefore, this area offers great opportunities for further study of flora and fauna. Uniqueness, highly developed biodiversity, the presence of rare and legally protected species, such as Ramonda Serbica, rue, Kosovo peony, gentianx, sage, hyssop, meadow saffron, bats, colorful salamander and other species make this area particularly interesting for nature lovers, speleologists and adventurers.

Picture 2. Cave beauties

Based on the degree of exploration and well-founded assumptions, (connection of objects from a hydrological point of view), the Cerje Cave is one of the longest caves in Serbia.

For the purpose of harmony between human creations and nature, all actions that are being prepared for tourist exploitation of this area must be a reflection of the natural characteristics of the area.

The data from prehistory and ancient history are scanty, but it is well-known that one Roman road was positioned in the valley of the Toponica River in the direction toward Svrljig.

During the exploration of Meča dupka in the protected area, the fragmented artifacts from the Middle Paleolithic (Mousterian), dating from at least 40,000 years ago, were found in the Pleistocene fossil rock layer. In addition to the artifacts, numerous well-preserved bones of Pleistocene animals (deer, bison, wild ox, horse) were found, representing the proof of hunting activities of Neanderthal.

Since the Neanderthal habitats in Serbia are scarce, a procedure has been initiated to register Meča dupka as an archaeological site and be proclaimed a cultural asset.

On the right bank of the Toponica River, there are the remains of a tower that used to be part of the town of Železnik in the Middle Ages. The town of Železnik was a mining town.

What has been done so far

The goal of all the activities of the Public Company Directorate for Construction of the city of Niš since the adoption of the Regulation of the Government of the Republic of Serbia (February 27th, 1998) was to improve the protection of the Cerje Cave Natural Monument. The preservation process provides usage and development that will enable permanent preservation and improvement of the condition in accordance with the Law on Nature Protection ("Official Gazette of RS", No. 36/2009, 88/2010, 91/2010 - correction and 14/2016), by prohibiting the activities that endanger the nature capacity, natural balance, biodiversity, hydro-geographic, geomorphological, geological and landscape values.

Manager's previous activities relate to the development and adoption of program, planning, project and managing documents, research activities support and the development of the natural resources.

Within the Program Documents, one Interim Program (1998) and two periodic programs of protection and development of the Cerje Cave (1998, 2007) were made. Management plan of the monument "Cerje Cave" 2011-2020 was adopted in 2012. Furthermore, according to these periodic programs and the Management Plan, annual management programs were made, and in accordance with them the annual reports on realization of the management programs and reports in compliance with the agreement on the co-financing of the management program were made as well.

As parts of the management documentation, two Regulations on Internal Order and Guarding Service in the "Cerje Cave" monument (1999, 2013) and the Decision on fees for using the protected area of the "Cerje Cave" monument (2013) were adopted.

Within the planning documentation, upon the initiative of the manager (Public Company Directorate for Construction of the city of Niš), a Regulatory Plan of the local road from Cerje to Cerje Cave and the Cerje Cave Complex (2001) was made. The main project of the local road L.11.2 Cerje - Cerje Cave, extending 2.2 km in length, was made, as well as the main design project for the underground river Provalija spatial arrangement with two water gates and the bridge across the river. The design project of the entrance to the Cerje Cave for the construction of the plateau in front of the cave and the stairs from the plateau to the entrance gate was also made. The main project "Development of project and technical documentation for the construction of the site complex - Cerje Cave Natural Monument" including the development of the main architectural and construction project, water supply and sewage and project of the complex electrification were made, too.

Several activities were carried out as a part of the research support. It is important to mention more important ones. During 1999 and 2000, biospeleological research was carried out by the Institute for Nature Conservation of Serbia in the wider area of the Cerje Cave. In August and

September 1999, the Institute for Health Care of Workers "Niš" carried out sampling and measurement of radon concentration in the air and water in the Cerje Cave. Detailed speleomorphological scanning of the first two kilometers of the Cerje Cave, with a graphic presentation, were carried out by the state-owned enterprise "Geozavod" Belgrade in collaboration with Academic Speleologic and Alpinistic Club (ASAK) in 2001. The project of speleo-morphological scanning and recording of the cave canals was realized by the Geodetic Services Agency "GEO-IN" from Indjija using the 3D laser scanning method. The measurement was performed within the state coordinate system with canal scanning in the length of 2,200 m.

Classic speleological research from 1998 to 2004 was carried out in collaboration of the manager with ASAK and Mountaineering Association from Belgrade. After this period, speleological research was carried out by the Institute for Nature Conservation of Serbia with associates, or speleological clubs from southern and eastern Serbia, such as "Dvig" from V. Han, SAIS from Zaječar and Knjaževac, and speleological section of Mountaineering club "Železničar" Niš.

Research speleo-diving actions were realized in cooperation of the manager with the club "Aqua Mont servis" in 1999 with trial dives in Kravlje hot springs in Pećurina (-15 m) and Pešter near Topilo (-22 m). During 2010, cave diving at the same locations was performed by an international speleo-diving team from Cavebase Exploration in Germany, DIR Exploration from Austria and members of the Balkan underwater exploration. That team of speleo divers, with reduced number of members, mostly comprising of Cavebase Exploration members, continued the field work in 2011 and 2012.

Activities within the construction and landscaping were numerous. During 1999, the boards for marking the protected area were installed, and were renewed in 2010. The last replacement of the boards was executed through the collaboration with the Municipality of Pantelej and the Ministry of Economy and Regional Development, within the project related to marking with the sign of nature protection and Cerje Cave logo. As part of the implementation of this project, road (tourist) signposts were also installed in compliance with the prescribed standards.

During the initial period of protection, solving property and legal relations was carried out and a new metal gate was installed at the entrance (1999), which was later repaired several times due to damage caused by torrents. In addition, in 2006, a metal fence was placed at the entrance to the Abyss “Cerjanska propast”. The project for the regulation of the river Provalija basin and the arrangement of the access path was realized in 2009. Two water gates on the Provalija riverbed, a bridge and 350m access path from the planned parking space to the bridge were made.

During 2010, the Project for the arrangement of the entrance part of Cerje Cave was implemented in cooperation of the manager with the Municipality of Pantelej and the Ministry of Economy and Regional Development - the Tourism Sector. Several projects were carried out within the construction works. The design for path above the cave entrance was made, a ditch for the surface water draining was excavated. The area around the cave entrance was arranged, stone stairs were made in front of the entrance with an appropriate ground surface and wooden banisters, the access plateau from the bridge to the stairs was paved and additional 45m of pedestrian path were finished. After the damages caused by torrents, stone embankment was built on both banks near the bridge, in the length of 20 m. Two shelters with one ancillary room

were built for the needs of the cave visitors. The contractor was "Lego piu" from Aleksinac.

In the inlet canal, during 2012, silt deposits were excavated from the underground river and removed to the sides, spread and transported. A hose with the dimension of Ø 50 mm was installed in the bottom of the canal for the purpose of quick water outflow and spilling by a syphon system. The contractor was "Kika Construction". In 2013, the same contractor performed works on arranging the plateau at the entrance to the cave and made stairs at the first two cascades in the Inlet canal. Using the co-financing funds of the Management Program for 2014, this contractor made educational panels and information boards and placed them in front of the entrance to the cave. The revitalization of the wells at the plateau in front of the cave was made by the program for the improvement of the building land for 2015. Within the framework of the IPA project Cross-Border Cooperation Program Bulgaria-Serbia, in cooperation with the Municipality of Pantelej, the road Cerje - Cerje Cave was built in 2014-2015, and it was one of the most important projects of bringing the area closer to visitors.

Picture 3. Several objects that were built on the plateau in front of the entrance to the cave

SWOT ANALYSIS

By the application of the SWOT analysis of the protected area conditions, the following has been observed:

Area advantages:

- Diversity with prominent natural values of the protected area.

- Development of the protected area, based on exceptional tourist motives and potential for the development of tourism, can have a significant influence on the advancement of this region from local to regional or republic level of importance.
- The location which is connected to the main directions of European transport communications, provides the opportunity for cooperation with larger surrounding communities and inclusion into the tourist offer of Europe.
- The existence of the Spatial Plan of the City of Niš and other planning documents, as well as most of the required technical documentation.
- Lack of illegally built objects.
- Sparsely populated area.
- High quality of main eco parameters
- The proximity of Niš Airport "Constantine the Great" and direct connection through the regional road R-120, R-214 give the region extraordinary importance and potential for the development of all planned functions.
- Successful cooperation with the local population
- The total increasing number of tourists on the territory of the city of Niš (If we compare the tourist traffic in 2017 to the continuous period from 2013, we can see that the growth was 69.5% higher, where the arrival of domestic guests was 42% higher, while foreign guests arrival grew by 100%. When we look at the registered overnight stays during 2017 in the ongoing period from 2013, it can be noticed that the number of overnight stays in 2017 increased by 54.9%, with 31.8% more of domestic tourists, while foreign tourist overnight stays increased for 90% compared to 2013).

Area weaknesses:

- Depopulation in this area as one of its basic characteristics, and at the same time very low participation of the young people, only about 19%. The age structure is distorted to the extent that normal reproduction of the population can not be ensured.
- The condition of local roads is not satisfactory, since even there where there is an asphalt cover the width of the road is one of the factors that influences the reduction of the road transport capacity and endangers road safety.
- The overall problem with drinking water supply has not been solved, which is also an exceptional limiting factor of the current development of tourism.
- The problem of wastewater collecting, canalizing and disposal has not been solved. The general structure of the problem-solving factor is potentially favorable, whereby development target should be a separate sewer system.
- Flood defense system has not been used, whereas installation of two floodgates on Provalija stream and local interventions on road protection make an exception.
- Absence of structure and equipment in public spaces as well as lack of recreational facilities for visitors during their stay (The exception is a partially renovated camp settlement on Kamenički vis).

- Area is not adapted for the development of various functions. So far, this has been a rural area with sporadically developed local tourism. Now, we should turn this area into a tourist unit.
- Diverse construction conditions, without architectural design values of the succeeded construction fund.
- Current insufficient visibility of the protected area within tourist offers.
- Lack of energy network to the cave.
- Lack of financial resources.

Perspectives of the area:

- Adopting the Law on Nature Protection, which will contribute to modernization and efficiency of the protected area management.
- Harmonization of the Law with European standards is expected, in the field of environmental protection, natural resources usage and spatial planning.
- Expected solutions for standardized financing of protected areas, constitution of stable Republic budget funds for enabling the manager to participate in basic business activities.
- The Urban Plan of the City of Niš for the period until 2021 was implemented in 2010 and at the same time the strategic assessment of the Urban Plan impact on the environment was made.
- The adopted Tourism Development Strategy of the Republic of Serbia and expected strengthening of financial and other types of support for programs and projects dealing with development of ecotourism, rural tourism and other forms of tourism in protected areas.
- The adopted Agriculture Development Strategy and Forestry Development Strategy of the Republic of Serbia and expanding the possibilities for financing programs and projects of rural development, organic and other sustainable agricultural production, afforestation and other kinds of activities for soil and forest protection.
- Preparation and expected adoption of the Strategy for Sustainable Use of Natural Resources and the Strategy for the Protection of Biodiversity.
- Expanding collaboration, mutual information, providing professional and other types of assistance among protected areas.
- Protected area is not visible enough (regardless of promotional entries and other ways of presentations) which gives additional opportunities for more successful offer.
- Construction of the visitor center "Cerje Cave" would provide opportunities for educating children and other persons who would not be able to enter the cave due to difficult entry conditions.

The risks of the area functioning:

- Insufficient material, professional and political support to the manager by the local self-government in fostering values of the protected area
- A long period of resolving property-legal relations
- Incomplete or very poor collaboration and coordination between professional and scientific institutions that carry out the research.
- Insufficient material, professional and political support to the manager by relevant ministries in fostering values of the protected area.

According to this analysis, we decided to use internal forces decisively and responsibly and eliminate or reduce external risks and hazards.

OBJECTIVES OF THE VISITOR CENTER "CERJE CAVE" CONSTRUCTION PROJECT

Objectives of the protection and development of the natural monument "Cerje Cave" will be significantly facilitated by the construction of the visitor center. The main objective of the project is building an adequate facility that will enable creation of space for facilitating preparatory activities concerning visits organization, space for improved and full presentation of the beauties and basic characteristics of the cave, for networking with related institutions and organizations.

The project company "Andzor engineering" d.o.o., Novi Sad, used the following data for the preliminary project design:

- Project task of the investor (manager, Public Company Directorate for Construction of the city of Niš)
- Data obtained by geodetic survey in the field
- Copies of plans in digital format
- Consultations with the representatives of the Investor

It has been planned to build four buildings, floors: GF (ground floor). The construction of the object is carried out at the site "Cerje Cave" on the territory of the Cerje village. The total gross area of the building is BGF = 300,81m^2. The net surface of the building is NGF = 224,82m^2.

The project has been designed in accordance with the project objectives, ambient environment, region, as well as with vehicle and pedestrian access. The mentioned plot is located on a slightly undulating ground. It has an irregular shape and covers the area of SA = 1931m^2. Car park is provided on the lot, 4 parking spaces for cars and 2 for buses.

The building is designed for tourism. It is specified by the project that all four buildings be

combined in one unit. Functionally, the object is divided into four objects, arranged in a row.

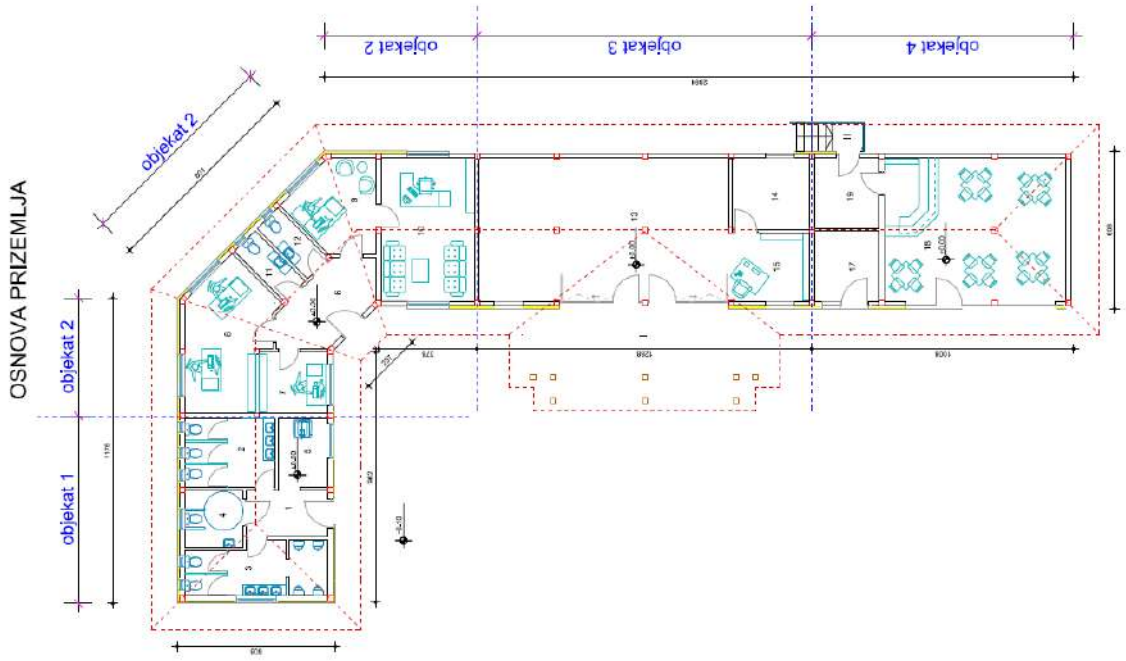
Building 1- sanitary facility (toilet anteroom, ladies, gentlemen, toilet for disabled and cleaning service premises, with a possibility of converting a part of those premises into a cloakroom).

Building 2- administrative building (entrance hall, reception counter, four offices, ladies' toilet and gentlemen toilet)

Building 3 - exhibition facility (exhibition space with ancillary room, ticket counter and covered porch)

Building 4 - tourist facility (souvenir shop and coffee bar)

A plateau for rest and recreation of visitors is planned in front of the building. The plateau is elevated 1.10m from the surrounding terrain and access to all four objects is possible from it.



Picture 4. Ground floor base – layout of buildings

Construction of that kind of object shall provide easier approach to visions and goals we are striving at:

Visions

- Preserved resources, diversity of forms, sizes, colors and composition of cave jewelry
- Secure refuge and habitat of diverse flora and fauna which resulted in the increased number of species in the meantime.

- Successfully preserved harmony of wilderness and the landscape shaped by human beings.
- Area of clean, high quality water, air and soil, without excessive noise and other adverse effects on human health and life.
- The area is well-known, easily accessible and is visited by researchers, pupils, students and also by people who are coming there to rest, recover and acquire new knowledge, carefully preserving the nature they are dwelling in.
- People living in this area and its surrounding doing good for the protected area and thus benefiting from it.
- The area is expanded by the sprawling areas of Kamenički vis and Topilo spa with adequate protection regime.

Objectives

- Conservation of geomorphologic, hydrological and speleological features and phenomena of geoheritage.
- Preservation of beauty and diversity of landscapes, maintenance and improvement of landscape and ambient features of the protected area.
- Formation of the tourist characteristics of the area (especially by the development of speleological, recreational, medical, rural tourism)
- Opening job positions within tourism activities and engaging a part of non-agricultural workforce from the surrounding villages
- Establishing mini market for selling agricultural products from this area.
- Specified and rational furnishing and use of the space
- Speleological research of the Cerje Cave and scientific research of thermo-mineral waters (Topilo spa) and the valorization that would facilitate their inclusion in the medical and touristic offer.
- Identification of zones and elements that are interesting for the aforementioned scientific work and research (speleological research of flora and fauna and geomorphological phenomena, etc.) should be used as basis for education and scientific work.
- Inclusion of the local population and all stakeholders in the activities related to nature and environment protection.
- Construction of the visitors' center "Cerje Cave" would provide the education of children and other persons who would not be able to enter the cave due to difficult entry conditions.

INSTRUMENTS FOR ACHIEVING THE GOALS

The center should become a gathering place where nature lovers would be able to talk, discuss and engage in the program activities.

The manager arranged the development of project and technical documentation for the construction of the site complex –natural monument "Cerje Cave" with the Ministry of Finance and Economy in September 2013.

The preliminary design of the project was developed by the company for designing, urbanism and ecology "Andzor Engineering" d.o.o., Novi Sad, in November 2015.

Site requirements were issued by the Urban Planning and Construction Department in January 2016.

The project investor is the city of Niš. Tourist Organization of Niš (TON) was appointed the project leader by the city.

TON applied for the project within the IPA funds through the Cross-border Cooperation Bulgaria-Serbia Office.

Interreg- IPA Cross-border cooperation project Bulgaria-Serbia no. RD-02-29-169 / 13.06.2017 will be funded by the European Union.

Elements of the project (building)

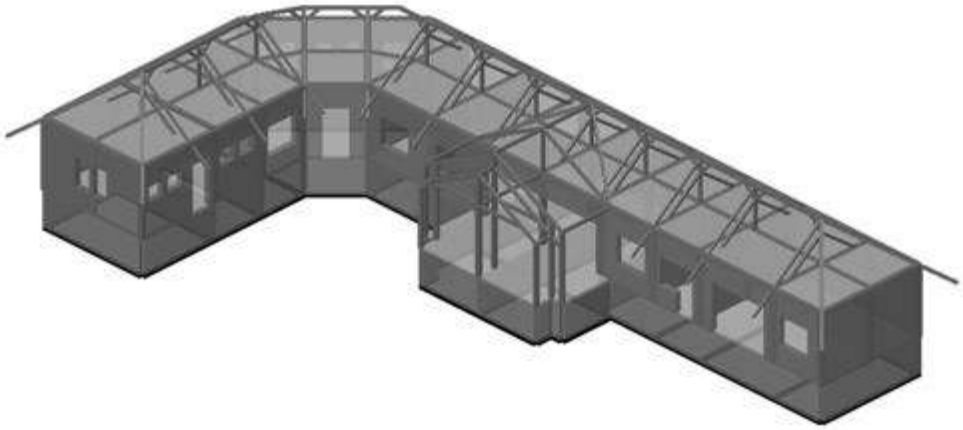
Looking from the plateau, there is a sanitary facility for visitors on the left side. Looking to the right from the plateau, there is an administrative building at the very corner. The central building in this row is an exhibition space, and in front of it there is a covered space where exhibitions could be organized. The central position of this building is accentuated by the staircase that is located exactly opposite the entrance to the exhibition area. At the very end of this row there is a tourist facility that actually represents a commercial part, where the souvenir shop is planned as well as a coffee bar where visitors could get refreshments.

The buildings are environmentally harmonized with the purpose of the site and the wooded surrounding. The building position is such that all rooms could have natural lighting and ventilation.

Construction

The building is located in the 7^{th} seismic zone according to MMI and in the 2^{nd} climate zone. The construction of the building resulted from its purpose, number of floors and the characteristics of the terrain. Reinforced concrete is planned for the bearing structure. RC skeleton structure with pillars and beams of variable span is proposed for the basic constructive system.

The foundation of the building would be on RC strip foundation with a standard depth of 0.80m. The floor slab is designed as an RC slab d = 0.10m. The ceiling is designed as a full RC slab. Roof construction would be a classic wooden construction with chords. The main plateau with stairs would be made of reinforced concrete as well.



Picture .5. Isometric projection of the visitor center "Cerje Cave"

Exterior and interior finishing

Walls

Hollow clay blocks and bricks shall be used for the construction of the building. Outer walls thickness = 0.19m. Inner walls thickness = 0.12 and 0.19m. All inner walls will be plastered, smooth coated and, depending on the purpose, the rooms shall be painted with semi-dispersion paints or covered with ceramic tiles. Polystyrene foam shall be put on the outer walls. The exterior of the building shall be finished with wood panel sheathing (planks or half-round logs) and at the level of the skirting with stone.

Floors

All the floors will be covered with ceramic tiles in the buildings 1, 3 and 4. Hardwood floor shall be installed on the floors of the offices and at the reception counter within the building 2, whereas the floors in the corridor and the toilets shall be covered with ceramic tiles. The floor of the plateau and sidewalks around the building shall be paved by stone slabs that will be laid in the sand-cement screed.

Ceilings

Ceilings shall be plastered, smooth coated and painted in white.

Roof

The roof covering should be coordinated with the existing architectural design of the objects on the plateau in front of the entrance to the cave, with the urban planning, positive ambient and architectural characteristics of the environment. The type of the roof shall be a gable roof with

dormers. The pitch of the roof level will be 370. The roof structure shall be made of fir-timber. Clay pantiles are planned for the roof covering.

All other elements of the building such as insulation, joinery and metalwork, installations in the building shall be done in compliance with the project. Standard products shall be installed.

PROGRAM CONTENT OF THE VISITOR CENTER "CERJE CAVE"

Organization of the Visitor Center "Cerje Cave" activities represents the basis of the program content and is comprised of the following elements:

- Organizing visits to the cave. Visits should be carried out in compliance with the Regulations on internal order and guarding service and the rules must be stricty obeyed.
- Organizing permanent exhibition, which can be divided into two parts.

The first part would be dedicated to speleology, with photographs of cave decorations, digital records of visits, the presentation of speleomorphological records and scanning of cave canals made by 3D laser (this is the only cave in Serbia and wider region that has the scanned cave canals). In addition, this part of the exhibition can also contain parts of damaged and eroded cave jewels, etc.

The second part of the exhibition would be devoted to the archeology of Meča dupka. The results of the exploration of Meča dupka were fragmented Middle Paleolithic (Mousterian) artefacts, at least 40,000 years old, found in the Pleistocene fossil rock layer. Apart from the artefacts, numerous well-preserved bones of Pleistocene animals (deer, bison, wild ox, horse) were also found, suggesting that the Neanderthals were hunters. Since Neanderthal habitats in Serbia are rare, it would be a good recommendation to register Meča dupka as an archaeological site and declare it a good of cultural interest.

Besides all the above, the exhibition part of the center could be used for exhibitions and presentations of other protected areas, institutions dealing with nature protection or environmental protection in general.

Organizing presentations, professional meetings and conferences

Since the cave is located at tripoint of destitute municipalities of Pantelej, Crveni Krst and Svrljig, young people from these municipalities, and the Balkans as well, are frustrated by poverty, their mobility level is low and they do not have opportunities to travel and exchange experiences with peers from other areas. Very often, they do not share the same values with their peers. They are deprived of adequate knowledge and social skills and that is why they do not consider starting their own business and do not participate in social activities of their communities, but in most cases they emigrate to larger communities. We plan to organize various meetings within the concept "education through recreation", that will offer young people an attractive mixture of education and practice, excursions, recreational sports and social activities. The goal of all the activities is to enable young people to reach their full education

potential and enhance their social capital which is essential for the "escape from poverty", not for the "escape from the country".

Our idea is to offer education and recreation, to support local organizations that are dealing with nature conservation, cultural and historical heritage. We would like to support the initiatives that will enrich the local tourist offer and capacities and have the potential to improve the living conditions of our local communities.

Organization of service activities

Service activities shall be carried out in the coatroom (supply room), the souvenir shop where CDs with pictures, gift sets for visitors, souvenirs, postcards, and keychains with cave symbols can be purchased, and the bar where visitors and participants in meetings can get refreshments.

It can be concluded that the program of the Center significantly contributes to the richer tourist offer. The target group of the tourist program offered in the Center are the citizens of Niš, neighboring cities, citizens of Serbia and tourists in general. Furniture has to be carefully chosen in order to make the Center functional and has to be adapted to the purpose of the Center.

TERMS OF REFERENCE

Developing the center as a complex through defining the program contents that will take place in the protected area.

1. Construction of the Visitor Center "Cerje Cave"

Operation of the Center will be determined after the completion of the construction, either through the annual program for managing the natural monument "Cerje Cave", which has to be approved by the Ministry of Environmental Protection or through a special program for managing the Visitor Center.

Programs refer to a year-round work, available to the public until 15:00 h with the flexibility of content adjustment to a tourist season, or 24 hours online.

2. Organizing visits

Potential visitors submit the requests to the manager - the Public Company Directorate for Construction of the city of Niš (its activities have been defined by the Rulebook on Internal Order and Guarding Service for that purpose). The manager issues the approval for visiting the area and objects of the natural monument. In compliance with the issued approval, the Guarding Service monitors visitors' movements and activities, keeps the records on the activities and reacts in an appropriate manner if the security of the natural monument is endangered.

When forming a group, it should be taken into account that the optimal number of visitors is seven, accompanied by two speleo guides, as defined by the Rulebook. Immediately before

entering, visitors will sign the Protocol on entry which, among other things, specifies that enetering the cave is at their own risk.

Due to limited capacities, the manager can sign a Business and Technical Cooperation Agreement with a firm that organizes visits with the compensation of the corresponding fee to the manager. The amount of the fee is determined by the Decision on fees verified by the Ministry of Environmental Protection.

3. Setting up a permanent exhibition

- Creating technical documentation for permanent exhibition setting.
- Making a selection, systematization and a list for creating flora and fauna images in the protected area.
- Making a selection, systematization and a list of images of cave decorations and other artefacts.
- Making flyers and other advertising material with the pictures of distinctive flora and fauna and cave decorations, distribution of material to schools, mountaineering societies and tourist organizations for the purpose of promoting the cave.
- Media campaign.

DEVELOPING NEW TRACKS AND FOOTPATHS AND INCLUDING THE EXISTING TRACKS IN THE OFFER

- Creating project and technical documentation
- Marking the pathways
- Making photographs of flora and fauna, cave decorations and the supporting texts.
- Making outdoor furniture.
- Media campaign at the beginning and at the end of the project.

The track from the visitors' center "Cerje Cave" to the rock shelter of Meča dupka where the artefacts from the Neanderthal period, almost 40,000 years old, were found. The length of this track is about 500m. This track should be improved by the installment of educational boards with short texts in the area in front of the rock shelter for the purpose of getting prehistory closer to the youth. This route is shown in the Picture 6.

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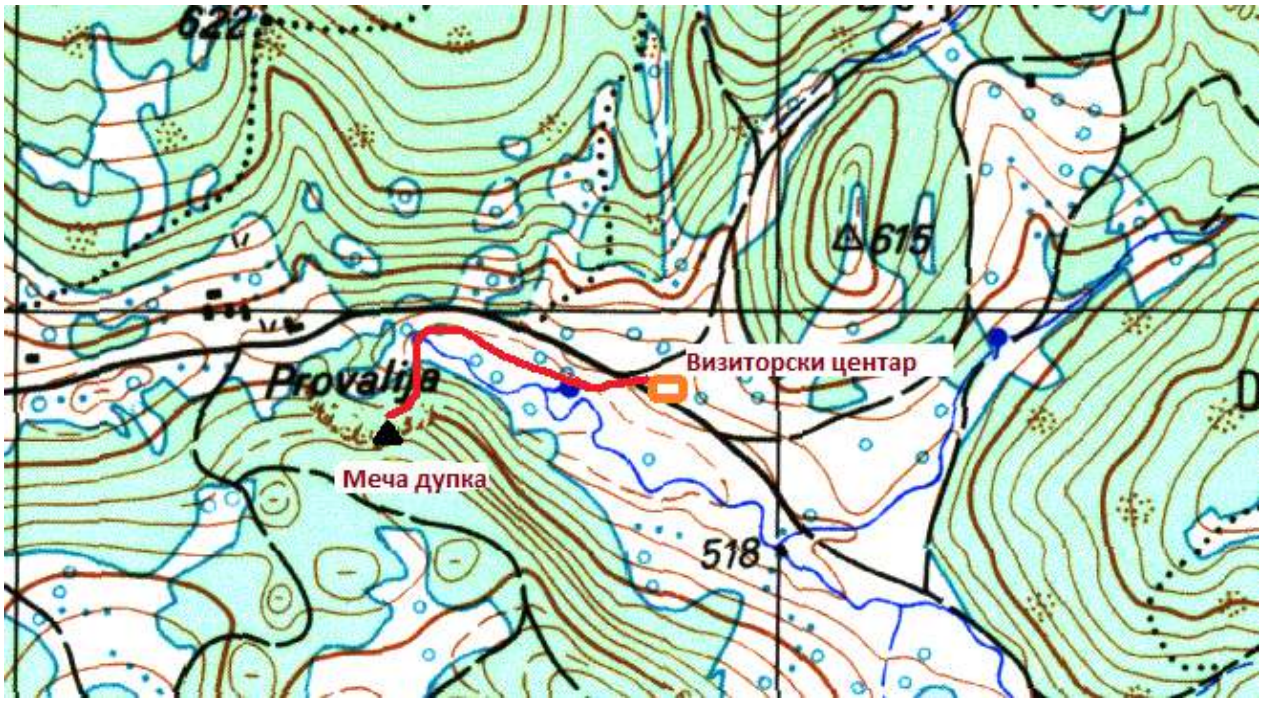
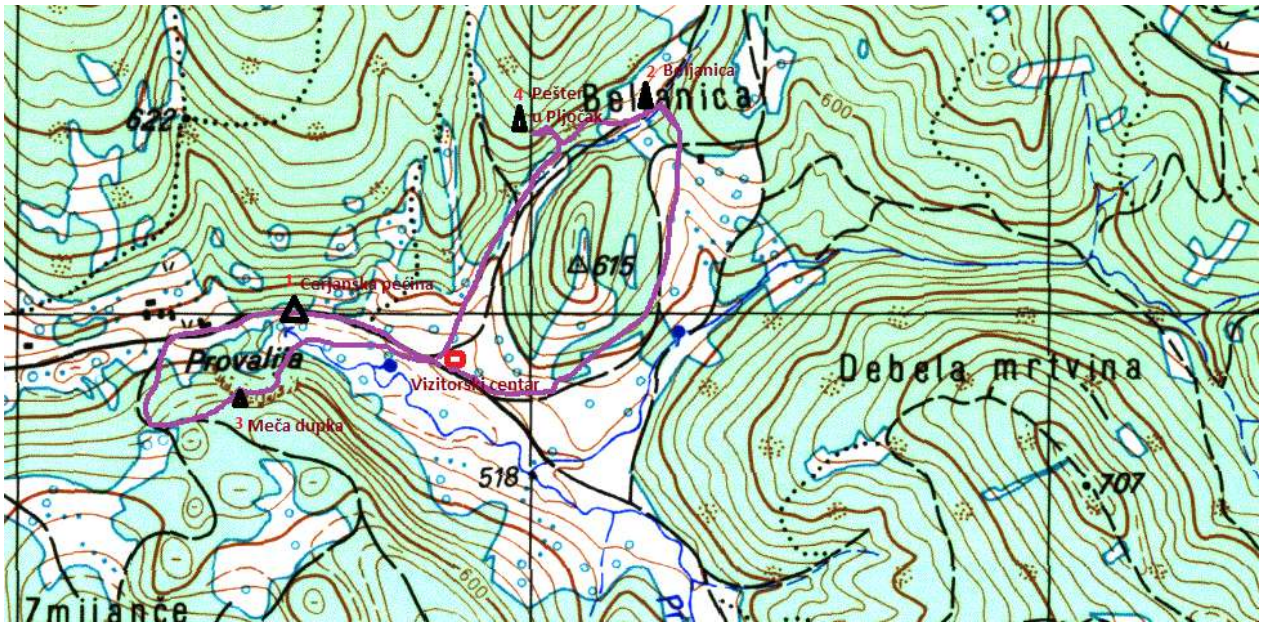


Сл. 6. The existing footpath from the Visitor center "Cerje cave" to Meča dupka

The track connecting the Visitor Center "Cerje Cave" and four speleo objects in the immediate surrounding area, which are Cerje Cave (Chasm), Meča dupka, karst cave "Cerjanska propast" (also known as Beljanica) and Pešter in Pljočak.

The total length of this track is about 3km. Part of this track overlaps the track to Meča dupka. This path should also be improved by installment of educational boards and outdoor furniture. Along this track, it is possible to turn a part of the area at Beljanica in a small center for growing alpine skills, since the depth of 89m provides excellent conditions for adrenaline lovers. However, it is already equipped for alpine sports. Pešter in Pljočak is also interesting, although it is small, since it possesses all the elements of a true cave, even the cave decorations, so it may illustrate the world of caves with little equipment. This track is shown in Picture 7.

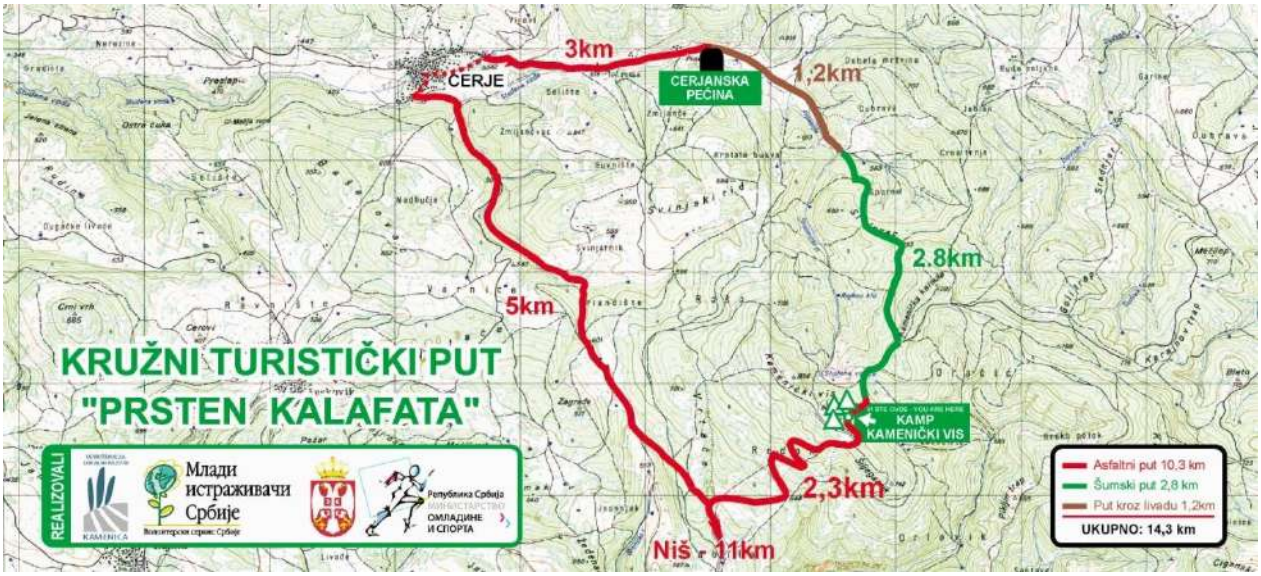


Picture. 7. The track connecting the Visitor Center "Cerje Cave", Cerje Cave (Chasm), Meča dupka, Cerjanska propast (Beljanica) and Pešter near Pljočak

The track connecting the Visitor Center „Cerje Cave" and Cerje Cave with the camp on Kamenički vis

This track is suitable for showing children the nature, walking, cycling and hiking with the specific purpose of exploring and enjoying beauties of nature. The paved forest road closes a larger circular route in full extent, both communicationally and substantially (along with the access asphalt road), and makes a total length of 14.3km. The road is shown in the Picture 8.

We intentionally used one "dead-end" junction of the asphalt road going from Niš and ending at the favorite picnic site of "Kamenički vis", just 14 km away from the city center and at the same time located 800 meters above sea level. The road ends right next to the mountain camp which has 100 beds. The camp is partially renovated with the intention to accelerate the tourist development of the whole area. Another "dead-end" junction of the asphalt road was completed owing to IPA funds two years ago and it leads to the Cerje Cave and the rock shelter "Meča dupka" where the remains of prehistoric man were found - the objects managed by the Public Company Directorate for Construction of the city of Niš. These two "dead-end" junctions are, nevertheless, connected by a forest road in length of 4.3 km, which is rather in a good condition but completely unknown to the general public.



Сл. 8. Track that connects the Cerje Cave with the camp on Kamenički vis

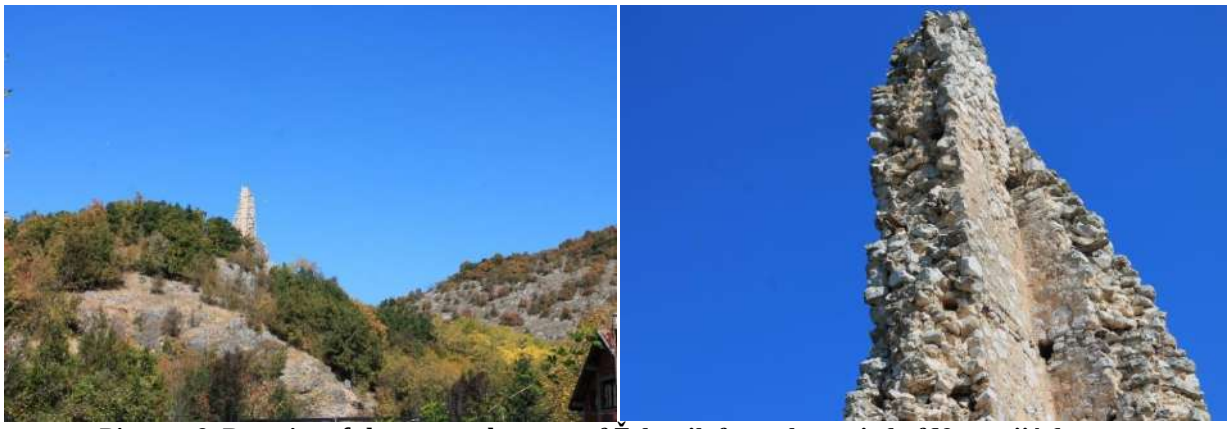
The track connecting the Cerje Cave, i.e. Visitor Center "Cerje Cave" and six speleo objects within the territory of the city municipalities Pantelej, Crveni Krst and Svrljig and two geothermal springs

What is characteristic for these objects is that they are almost 3-5 km in distance from the Visitor Center "Cerje Cave". This fact additionally enhances the significance of the Visitor Center since they can now be offered as a tourist route from one place.

If we continue our route after the cave Samar to Svrljig, and from the exit from Svrljig to Niš, going left to the village Prekonoga, there we would visit the Prekonoga Cave which was adjusted to the turist visits in the early 20th century, and then forgotten. While going back to Niš (on the way, some of the cultural and historical heritage monuments could also be visited), to the Visitor Center „Cerje Cave" we shall get a round-trip. Thus, by a single round-trip route, we could connect the largest part of the rich natural, cultural and historical heritage that gravitates towards the top of the Kalafat Hill into a unique tourist entity suitable for single-day and multi-day tourist tours.

We can see incredible beauty along this route. Among other things, there are the Kopajkošara Cave (Samar or Milutin's Cave), named after the speleologist Milutin Veljković who lived in this cave for 465 days and thus broke the Guinness record. We can see Popšica Cave rich in the colonies of bats, and already mentioned Prekonoga Cave. There are numerous limestone gorges with mountain streams, little-known village spas with healing geothermal springs, wide rich forests on Kamenički vis with glades rich in wild medicinal and aromatic herbs, including the endemic species "Ramonda Sebica" and the flower "Phoenix" that American NASA studied for its unique ability to revive after a couple of years of dryness with just a few drops of water.

Along the way, we can also see cultural and historical heritage monuments like Humska čuka – one of the three most important European archeological sites from the Stone to the Bronze age, the remains of Roman aqueduct built by the Legion of Claudius VII, remains of Via Militaris, the Nemanjić fortification Železnik (Picture 9), Latin church from the 12th century, the medieval monastery of St. George and St. John with the transcribing school (Picture 10), village church, the Čegar monument and monuments from the recent history, complex of village houses in the Moravian style, wine cellars, water and roll mills, homemade food.



Picture. 9. Remains of the tower, the town of Železnik from the period of Nemanjić dynasty

This route passes by geothermal springs. One of them is on the way from the village Cerje to the village Miljkovac, it is an unpaved road, but very busy and near the town of Železnik, also known as Vidrište. Going further, one will come to the marked objects 3 and 4, and these are the Topilo spa with valuable geothermal water, and a water intake Pešter which is interesting for cave diving. The team of German cave divers caried out deep exploration dives up to 120m, with the remark that it is possible to dive deeper with adequate equipment. The most important part of this route is shown in the Picture 11.

Picture 10. Monastery of St. John from the 12th century in Matejevac

Picture 11. The route connecting the Visitor center "Cerje Cave" and speleo objects on the territory of the municipalities of Pantelej, Crveni Krst and Svrljig

Key:

1. Visitor Center „Cerje Cave";
2. Cerje Cave;
3. Topilo spa;
4. Captured karst spring Pešter;

5. Siphon hot spring in Kravlje;
6. Krast cave above the siphon spring in Kravlje;
7. Popšica Cave;
8. Kopajkošara Cave or the Samar system.

The track from Cerje Cave, via Svrljig, Zaječar to Northwestern Bulgaria, the region with numerous speleo objects and other beauties of nature

The landscape of Vidin, Montana and Vraca is beautiful and has a very rich offer. As in the case of the Cerje Cave and its surroundings, this area is also rich in speleo objects. There are 30 more caves in this area beside Magura, the most famous cave located 25 km north of Belogradchik, best known for its prehistoric drawings, and Ledenika, the most visited cave for the exceptional service areas even though it is only about 300 meters long and has only a dozen of chambers and is located in the region of Vrachanski Balkan. The list of these caves is shown on the board in front of the cave Magura. Picture 12. shows Magura, and Picture 13. Ledenika.

Picture 12. Magura

The list of speleo objects in this region:

Neprivetliva, Hajduška propast, Propast, Kariera peč, Suhata, Mirizlivka, Venec, Prelaz, Zmijskata propast, Remina dupka, Kračemirsko vrelo, Martin 11, Premenska dupka, Janulova dupka, Jokin medžak, Jame I, Jame II, Temnata dupka, Jame III, Tatarskata pešter, Vodni peč, Levi suhi peč, Desni suhi peč, Kaskada, Magura, Malkata magura, Pragove, Jubilejna 74, Zemna dupka i Ringova pešč.

Picture 13. Ledenika

Apart from these speleo objects, the town of Belogradchik is very interesting because of its exceptional geomorphological structures with an old fortress. This is shown in the Picture 14.

Population decline is characteristic for this part of Bulgaria, and it is considered that the far distance from the main development streams of the country is to blame, so the development of various tourism offers is an attempt to stop the outflow of population.

A good example of completing the offer is forming an Eco path on the Vrachanski Balkan near the town of Vrace. The passage below the "Borov kamak" waterfalls is an extraordinary attraction of this mountain path.

Picture 15. presents the details of this Eco path.

Hopefully, joint offer of Serbian and Bulgarian partners would additionally increase the number of visitors.

Picture 14. Belogradchik

Picture 15. Eco path and the passage below waterfalls

PLAN OF THE PROJECT TERMS OF REFERENCE

a) Construction of the object - Visitor Center "Cerje Cave" (elaborated within the chapter "Elements of the project")

b) Equipping the Visitor Center "Cerje Cave"

Equip the facility with furniture and adequate equipment and also with necessary speleo equipment.

- Furniture and equipment (work desks, chairs, metal file cabinets, exhibition stands, promotion boards, projector, LED screen, TV, information touch screen, lap top, sound system, air conditioner ...)

- Speleo equipment (suits-overalls, shoes, thermal blankets, safety belts, ropes, auxiliary ropes, helmets, anchors, chest climbing harnesses, carabiners, rollers, transport bags for equipment, inflatable boats, plastic stretchers for rescuing and pulling out injured persons etc.).

- Equipment for technical security of the building represents special kind of equipment. It is necessary to carry out continuous monitoring which includes technical supervision of the facility and informing the contracting authority or a contact person about the occurring changes in the facility. The facility would be monitored round the clock by the Security Agency Operations Center. The alarm system affixed to a telephone line would be connected to the alarm center so that the center could monitor all the events of the anti-burglary system.

c) Creating a permanent exhibition program (elaborated in the chapter "Project activities" chapter 3)

d) Choosing visits organizer

Due to limited capacities of the manager for organizing visits and lack of logistics, it is necessary to open the public call for selection of organizations that meet the requirements and have capacities to organize visits successfully.

A selected organization will have to:

- provide equipment for entering the cave,
- provide professional speleo guides,
- organize transport of visitors to the cave, if needed,
- ensure the payment of local taxes, insurance, organize logistic support,
- charge a fee in accordance with the Decision on Fees and pay this fee to the manager

e) Prepare project and technical documentation for the revitalization of existing footpaths and tracks and for creating new ones. Tracing and installing equipment on the tracks (elaborated in the section "Project tasks" position 4)

f) Fostering visual identity

The manager, together with the partners, primarily with the Tourist Organization Niš, has been working on the visual identity of the Visitor Center "Cerje Cave" and the entire protected area. The following activities are particularly contributing to the visual identity: fostering constant presence in the media and on social media networks. Selection and creation of high quality advertising material.

Since the Natural Monument has been present for some twenty years and thus a kind of a visual identity already exists, it is surely rational to use the existing identity logo of the Natural Monument. Shown in Picture 16.

Picture 16. Natural Monument "Cerje Cave" logo

Carrying out the activities at the Visitor Center "Cerje Cave" would not be possible without the synergy of NGOs, public and individual creative potentials.

FINANCIAL FEASIBILITY

The financial feasibility of the Visitor Center "Cerje Cave" is impossible without a broader context - the development of tourism, the development of the local community, the creation of a certain positive identity of the city, the space, shaping the image of the object itself.

The financial sustainability of the Visitor Center "Cerje Cave" is a mandatory condition for the continual realization of the existing program activities. In financial terms, the contents are divided into the part that brings profit and the non-commercial part, but both represent the budget of the Center.

The Center earns the revenues based on two grounds:

- programme activities and
- service activities (that complement other revenues)

It is concluded from the positive experience that during the first two years the Center will mainly earn income from the local self-government budget, and later this would change in favor of independent sources of income.

The costs related to maintenance and operation of the power generator for producing electricity would represent a particular problem in the sustainable use of the Visitor Center "Cerje Cave". For this reason, it is more convenient to get low-voltage power grid supply from the village Cerje as soon as possible, because these investments would pay off very quickly. Otherwise, technical security services of the facility whose monitoring requires operation of the power generator on a daily basis, will additionally contribute to the increase of costs.

Regarding the costs, it is preferable to follow this layout:

- program 35%
- technical 10%
- communication 10%
- office 5%
- staff 30%
- other 10%

The Law on Nature Protection and the Regulations on Protection of Natural Monuments "Cerje Cave" have determined that the funds for the protection and development of the protected area, and thus the funds for the Visitor Center shall be provided from:

1. budget (according to the level of competence of the republic and local self-government)
2. revenues (Public Company Directorate for Construction of the city of Niš) made by the performed activities of the company
3. fees for using the protected area
4. other sources in accordance with the Law (sponsorships, donations, pre-accession funds)

As for determining the possible costs, a comparison analysis of advantages and disadvantages of a project is needed.

LEGAL STATUS AND MANAGING STRUCTURE

The titular head of the natural monument Cerje Cave is the Republic of Serbia, and the city of Niš is the titular head of the Visitor Center. The Natural Monument was entrusted to the Public Company Directorate for Construction of the city of Niš by the Regulations of the Government of the Republic of Serbia.

It would be rational that the city of Niš entrusts the the management of the Visitor Center "Cerje Cave" to the same manager, i.e., Public Company Directorate for Construction of the city of Niš.

The manager of the Public Company Directorate for Construction of the city of Niš (director) would be the responsible person.

Legal status shall be determined by the city of Niš.

The management structure is determined by the regulations of the Law on Nature Protection and the Decree of the Government of Serbia. Following the previous analogy, the city can form the managing structure of the Visitor Center "Cerje Cave".

Managing activities are carried out by an officer for nature protection on behalf of the Public Company Directorate for Construction of the city of Niš. One licensed nature conservator is engaged in the activities directly related to the protected area. It is sufficient to engage one executive for the activities of nature conservation since the space of the protected area is relatively small.

At the moment, according to the current job classification of the Public Company Directorate for Construction of the city of Niš, there is a lack of employees who would physically protect the facility. By the construction of the Visitor Center "Cerje Cave" this becomes a compulsory activity. There is also a possibility of hiring a security agency.

If the manager wants to be successful in performing the required tasks related to achieving the goals, it has already been confirmed that the synergy of subjects is needed. For improving the functioning it is necessary to institutionalize this collaboration which is possible by forming:

- Professional Council and
- Council of Beneficiaries

In addition, it is necessary to cooperate with the partner on this project, which is the Tourist Organization Niš.

The manager of the protected area and the Visitor Center "Cerje Cave" must endorse various forms of formal and informal arrangements and joint activities, including partnership relations, with:

- the competent Ministry for Environmental Protection
- the City of Niš and its Administration and Secretariats
- Environment protection budget fund of the city of Niš
- City municipalities Pantelej and Crveni Krst where the protected area is located
- Tourist Organization of the city of Niš
- Institute for Nature Conservation of Serbia
- Tourist organizations
- Sports clubs (speleo clubs, mountaineering clubs, diving clubs, etc.)
- State Enterprise “Srbijašume“
- Other public and utility companies
- Accessible funds of international organizations and foundations available to local self-governments.

MONITORING AND EVALUATION

For achieving successful results in the project, control processes, like monitoring and evaluation, must be carried out.

The criteria (standards) for monitoring the activities should be set in advance in order to identify irregularities in time.

Monitoring and evaluation activities during the construction of the facility are carried out by the supervisory body.

After the construction, monitoring of environmental parameters and already described monitoring of technical supervision of the facility shall be prerogative for further functioning.

Key parts of monitoring are biodiversity, geoheritage, landscape, forests, air, water and land.

The monitoring system uses the following databases as information sources:

- environmental data obtained in the process of developing and implementing various projects and programs in the protected area
- data obtained by regular monitoring of environmental parameters defined by Rulebooks and other regulations at the Republic or local levels

For the time being, the manager has started regular control of the parameters essential for the cave interior, which are the temperature and humidity. Every time someone enters the cave, these parameters are being read.