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REHABILITATION OF THE DENDROLOGICAL PARK IN BUHUSI, BACAU COUNTY

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Abstract

The idea of rehabilitation proposed in the present project presented in this paper aims primarily to capitalize on green spaces in the park located in downtown Buhusi, increase the area of land legally framed as green space, giving up some parasitic elements such as basketball court on the territory park, increased accessibility and the creation of the best conditions to cover the need for relaxation, culture and education of all categories of population without discrimination.

The rehabilitation solution proposes a completely new architectural concept with landscape elements - defining the organic style. The arrangement scenario consists of free, sinuous shapes meant to create a harmonious, balanced rhythm and to strengthen the feeling of space. The interior of the proposed rehabilitation solution is intended to provide a gradual transition between the various functional areas of the park.

The vegetation will consist of small shrubs and conifers arranged in clusters that grow in decorative terraces throughout the year. The arrangement of deciduous and coniferous trees will be made so that the colour offered is diverse in all seasons.

Key words*: composition, dendrological, park, rehabilitation*

INTRODUCTION

The environment can be defined as a system of three elements, the natural environment, the urban environment and the urban living environment, between them there is a close interdependence and interaction that ensures the balance in the environment necessary for human survival and evolution (Nordh et al., 2009). Therefore, the balance of the environment is vital for humanity, the proper functioning of each element being essential (Borsari et al., 2010). As a result, if we consider the improvement of the quality of life of the population in small and medium-sized cities in Romania at national level, statistics indicate that in small and medium-sized cities, compared to large urban centers appear the risk of poverty and social exclusion. Thus, the proportion of the urban population unaffected by housing, employment or human capital development deficiencies decreases with the size of the city, registering the lowest values at the base of the urban network, of 43% in small towns (10,000-20,000 inhabitants) and 29% in very small towns (less than 10,000 inhabitants).

Buhuși, according to the local territorial administrative unit, on 1st of July 2015, had a population of 20,871 inhabitants and two localities under administrative subordination: Marginea and Runcu.

Taking into account these aspects, the rehabilitation project presented in this paper aims to simultaneously solve the improvement of social, educational, cultural and recreational services, as well as the improvement of urban public spaces in the central area of Buhusi, with implications for improving the quality of life. The integrated approach to the city's problems will lead to the simultaneous solution of several requirements and needs of the population, between which there are interdependent relationships, thus contributing to the fulfillment of the vision of the city's development (Accati et al., 2010).

The general objective of the project treated in this paper is the rehabilitation/modernization of the Dendrological Park in Buhuși, Bacău County, by arranging recreation spaces for all categories of population, without discrimination and creating facilities at the same time, in order to achieve a quality public

space according to the principles of urban regeneration.
Improving the quality of life in Buhuşi by rehabilitating the green spaces in the Dendrological Park is one of the main components of the rehabilitation project that aims to improve urban public spaces in the central area of the city (A = 6,633,000 sqm).

MATERIALS AND METHODS

The Dendrological Park is located on Mihai Viteazu Street which connects with the Victoria Cinema building to Mihai Viteazu Street and Ion Ionescu de la Brad Street. The space is called Dendrological Park, although it does not meet the necessary conditions for authorization as a dendrological park with an area of less than 1 ha. This name is found in the usage of the citizens of Buhuși and in the public administration field.

Figure 1. Location of the project design

Currently, the land belonging to the Dendrological Park is used improperly, being degraded, having an aged vegetation and not at all in tune with the contemporary needs of the inhabitants. The project presented in this paper proposes the arrangement of a green area consisting of a park and garden for unlimited public access.
Within the arrangement of the space related to the park, it is proposed to build pedestrian alleys made of pavers placed on a sand support layer 3 cm thick, the foundation layer being made of ballast 10 cm thick after compaction. The width of the designed alleys is variable, being between 2 and 5 m, which also serve as occasional access for the necessary interventions. Thus, within the park, the surface of the arranged green spaces is 4393.80 sqm - provided to be planted with trees, shrubs, flowers, etc., with the complete lawning of the remaining surfaces and their automated irrigation.

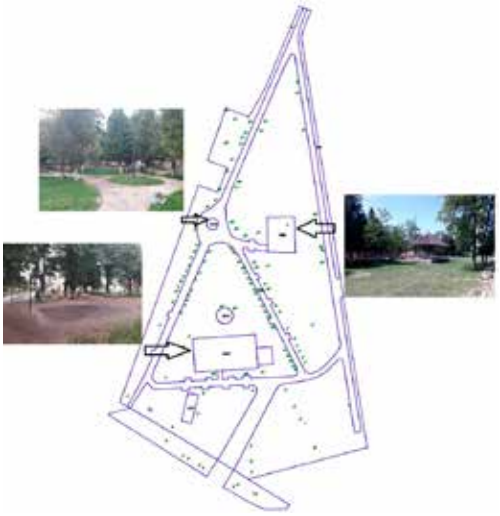

Figure 2. Plan of the existing situation

From a climatic point of view, the site is located in an area with a temperate-continental climate with strong Baltic influences, which gives a rich rainfall regime both in winter and in summer and temperatures 1-2^{0}C lower compared to other regions in the Cracau-Bistrita depression. From the multi-year meteorological observations, it is found that from a thermal point of view, the analyzed area is characterized by average annual temperatures of 8-9^{0}C. The minimum air temperature drops to approx. -20^{0}C in the winter months and reaches maximum values of approx. +32^{0}C in the summer. The warmest month of the year is July (with an average temperature of 18-19^{0}C), and the coldest, January (-3.5 ÷ -20^{0}C).
As public spaces, green spaces contribute to increasing social inclusion, by creating opportunities for people of all ages to interact both through informal social contact and by participating in community events (Tassinari et al., 2010). The dendrological park development project proposes the creation of a setting suitable for bringing to the landscape the areas for various social and cultural events, such as local festivals, civic celebrations or theater, film, etc. Thus, they "help to form the cultural

identity of an area, are part of its unique profile and give a sense of place to local communities" (Toscano et al., 2017). Well-maintained green spaces play a significant role in promoting the health of the urban population.
They offer opportunities to encourage a more active lifestyle, such as walking, running, exercising, cycling, etc., including travel between inhabited areas and/or various public facilities (Pivetta et al., 2010).
Some studies show that the main value of green spaces derives from their ability to restore the "well-being" of those who frequent them (Zilemenos & Paraskevopoulou, 2017).
They provide citizens with quiet places to relax and reduce stress, to escape from the built environment and traffic. Green spaces respond mainly to human needs for recreation and leisure. In the case of people without income or time, the park remains the most convenient solution for recreational activities (Loukil et al., 2010). Also, the Dendrological Park we propose to host playgrounds for children, contributing to their physical, mental and social development. Urban green spaces are also of great importance from an aesthetic point of view, as they attenuate the impression of rigidity and aridity of any built environment (Nikologianni et al., 2017).

RESULTS AND DISCUSSIONS

In order to make the arrangement proposal, a detailed study was taken into account on the existing situation in the Dendrological Park, following which it was found that the accesses to the park are undervalued, not being imposing due to degradation and sizing.
The alleys are degraded and there is no route to ensure a circulation with axes of perspective and points of interest.
It is necessary to completely replace the pavilion, as it shows strong signs of degradation, being physically and morally outdated, as well as the restoration of perimeter sidewalks that are currently missing or are cracked and detached from the base of the building and no longer play the main role, to carry rainwater away from the construction. Over time, these lead to subsidence of the foundation, which affects the entire structure.
The fencing is made of unsightly materials (prefabricated concrete panels and wire mesh and reinforced concrete pillars) on all sides of the park. The access gate made of wood is degraded and does not present safety in operation, requiring a rehabilitation, both structurally and in terms of finish.
If we study the definition of a dendrological park - "an area where trees and shrubs of different species are planted, intended to study the conditions of their development, the result of both the natural spread of tree species and human cultivation on the same area, of native species as well as some exotic ones" in the context presented in this park we will find that the name of "dendrological park" is a purely given one by locals (Glaeser, 2010). In reality, the vegetative material is insufficient - the vegetation consists only of trees of size I (*Tlilia tomentosa* and *Thuja* sp.). These trees require crown correction grooming. The fact that the lower layers of vegetation are missing could create air currents that favor the circulation of dust (Glenn et al., 2017). Proper vegetation is also vital to provide chromatic dynamics throughout the growing season.
The surface of the soil is mostly uncovered, favoring the raising of dust, and in some areas *Convolvulus arvensis* and *Polygonum aviculare* have developed, which have suffocated the grasses from the initial turf.
The park does not have adequate lighting, most of the lighting fixtures are malfunctioning and incorrectly arranged in relation to the alleys and related spaces. There is no public drinking fountain in the park, mandatory according to the requirements of the specific regulations.
The urban furniture, consisting of benches with metal structure and wood, is insufficient and incorrectly placed, there is no functional connection between benches and alleys, they are randomly arranged on the green space.
Concrete planters are structurally and morally obsolete, in which random vegetation is currently growing.
The park does not have an irrigation system, it is not watered properly and it is not constantly maintained.
The children's playground is not delimited by the rest of the park and the equipment in it does not ensure a satisfactory degree of safety for the users. The risk of accidents is imminent. At the same time, it is not designed to be of interest to little ones.

The basketball court is also indefinite, incorrectly located and unsanitary, it has a high degree of insecurity. In fact, its presence in the area can be considered unproper because the practice of a sport in the center of the park will inevitably lead to the discomfort of all other users.

Due to the very high degree of damage and the faulty arrangement of all the equipment present in the park, it is necessary to replace them with some that respect the minimum conditions of resistance, stability and functionality imposed by the current normative acts.

In conclusion, the Dendrological Park does not invite and does not present itself as a pleasant space and although it is located in the central area of the city and in the vicinity of two important educational institutions it is unfrequented, being for the most part unpopulated.

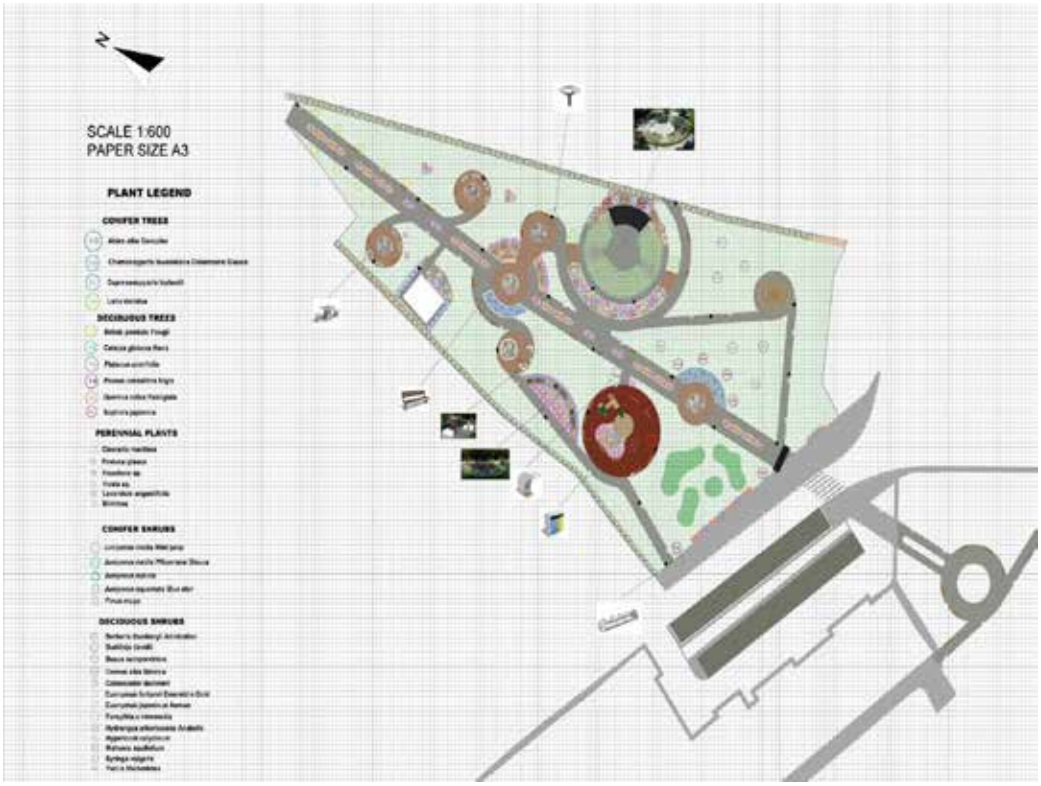

Figure 3. The proposed arrangement plans

The design of the arrangement proposes a different architectural concept, the landscape elements that are part of it defining the mixed style. The script, built of regular shapes that combine with free shapes, creates a harmonious, balanced rhythm and strengthens the feeling of space. The interior path of the proposed green spaces provides a gradual transition between the different functional areas, as can be seen in Figure 3.

In order to help preserve the nature on site, the shrub and arboreal vegetation has been carefully placed in the proposed development to facilitate the application of maintenance and possibly correction work when needed, so as not to represent a danger to those who frequent the area. These spaces, by rehabilitating the green areas, restore their functionality and vitality, reconnecting the connection between man and nature. Thus, by respecting the design principles, the Administrative Territorial Unit (ATU) Buhuşi City, Bacău County will not be aware of the specific forms in the plan, but will benefit of the countless pleasant relationships produced by the projected ambiance.

Figure 4. The main entrance to the Dendrological Park

In order to emphasize the recreational effect of the site and at the same time to create a safe space for promenade in the area at the entrance to the park, it was proposed to install circular elements designed to protect the space from car access but also to relax the gaze through their organic volume, as can be seen in Figure 4.

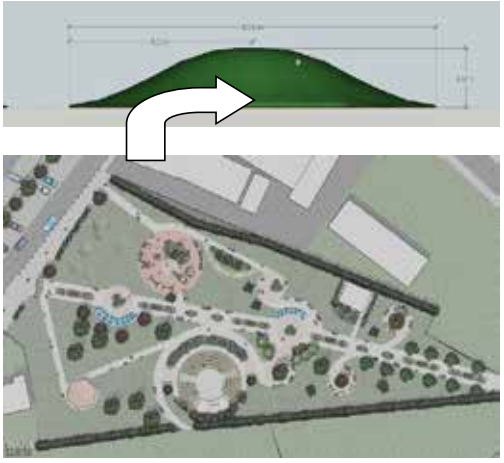

Figure 5. Artificial hills

In order to accentuate the organic forms, artificial hills of different shapes were created, highlighted both during the day and in the evening through the system of placing the vegetal material in the siting places (Figure 5).

The artificial hills could also function as sitting places.

Figure 6. Alveolus located inside the alleys

For aesthetic purposes, closely related to one of the basic human needs, is the need for beauty, namely the aesthetic function. In this context, the aesthetic function of this site was proposed to be capitalized by the plant elements that liven up green spaces.

As a result, in each alveolus located inside the alleys shown in Figure 5, the intent was to create some vegetal compositions that would offer a pleasant image and a discreet scent, to all those who either walk or transit the park.

Figure 7. Composition using *Festuca* and *Lavandula* species

In order to facilitate the easy maintenance of the green areas in the park and for sustainability reasons, the water element was simulated by introducing a transparent vegetation, whose noise produced by the wind blowing through the leaves to simulate the rustling of the water and whose color contrasted with turquoise stones resemble the luster of a lake (Figure 7). Through this intervention on the landscape, it can be concluded that this arrangement sums up all the natural factors: water, air, soil, subsoil, solar energy and existing organisms, which determine the living conditions of man and the development prospects of society.

The place from which the major axis of the composition starts is proposed to be the "gateway" and is the area of connection with the city and its turmoil. The role of this area, which will occupy the entire current location of the central park, is to stop, invite and prepare passers-by for the experience offered by the areas arranged in the perimeter of the dendrological park. This area, due to the positioning between two heavily trafficked streets, remains a transit area and the way of carrying out the arrangement and the proposed endowments mainly respects this fact.

The alleys in the rehabilitation proposal will be made of prefabricated tiles made of antique vibro-pressed concrete (finish obtained by technical procedures for aging concrete slabs), to create an aspect that expresses the passage of time. The pavers will be delimited with borders of the same material.

Figure 8. Composition using *Prunus* and *Abies* species

The purpose of bringing the *Prunus cerasifera* and *Abies concolor* species (Figure 8) into the designed landscape was to define and accentuate the volume of the site, both for the winter and summer decoration. The shapes in this arrangement that can be seen in Figure 8 are defined by lines and are what we see for the first time when we look at the arrangement from a distance.

An important note that was taken into account when the plant plan was systematized at the site level is also related to the physical characteristics of the land in question, namely: location, size, surface and shape of the land, topography, plot, access to utilities, pedological features, local climatic conditions.

Free or built, the value of the land is created by the utility or capacity of the land area to meet the wishes and needs of society, as a result, the introduction of a children's space in the design determines the exponential increase in the value of the site.
Utilizing this type of land contributes to the sanitary function. Also, in the whole arrangement a sense of unity is created by the introduction of an amphitheater (Figure 9), taking into account the fact that this park is close to an educational center.

Figure 9. Amphitheater

The functional urban furniture and the beautifully arranged green spaces as can be seen in Figure 10, create a pleasant and civilized atmosphere in the city. In this space, the points of interest are represented not only by the built elements but also by the diversity of plants and woody vegetation.
Studies have shown that people are able to talk to each other more easily by focusing on their common focus, which is why they have proposed the introduction of eight chess tables with two chairs, and it has also been proposed to create a space for forest-park, thus demolishing all barriers of coercion on socialization in which people regularly perceive themselves as strangers (Gunnarsson & Lorentzon, 2017).

Figure 10. Combining the vegetal elements with the built ones

This way of systematizing the arrangement aimed at the efficient and intense capitalization of the land by creating new points of attractiveness that could contribute considerably in the development of the tourist circuit, but also in bringing an aesthetic value to the whole area.

CONCLUSIONS

The present solution proposes a completely new architectural concept with landscape elements - defining the organic style. The arrangement scenario consists of free, sinuous shapes meant to create a harmonious, balanced rhythm and to strengthen the feeling of space.
By rehabilitating the green areas, the place is given functionality and vitality, to restore the connection between man and nature and the perspective on the space is all the more underlined by the different plant compositions located at the site in order to animate the park, transforming in a local center of interest.
In order to achieve the sustainability of this arrangement, plant species were chosen due to their resistance to pollution and poor quality of the soil, but also because of their decorative properties. They transmit to the landscape the characteristic features of the season according to the phenophase, underlined by diversity and chromaticity. Thus, the harmony and polychromy of the colors from the point of view of the aesthetic orientation can emphasize the the strong points of the rehabilitated landscape.

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