

ENVIRONMENT QUALITY IMPROVEMENT AT THE UNIVERSITY OF PITESTI, A FORMER MILITARY SITE

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Abstract

The present article is meant as a detailed presentation of the problems which can occur in the conversion of military sites into other centres, through entrepreneurship. The area looked into is located in Rimnicu Vilcea, where the University of Pitesti, after taking over a part of the original area, carries out some of its activities. This study is meant to be a criterion for sustainable development, namely environmental, landscape restoration proposed by contributing to environmental quality improvement and pollution sources reduction by removing the aspect of "vacant land", degraded and untidy. The studied area has a surface area of 72820 square metres and there are 23 buildings on it. The land measurements have been made with specific topographic equipment: GPS SOUTH S86-T and Pentax total station W-822NX, using RTK-kinematic method. The planimetric coordinate values have been registered for each point in the 70's Stereo System. In order to identify the species of trees and shrubs resistant to environment and microclimate conditions, a small dendrologic study has been made. The plants have been planted as naturally as possible in order to fix the soil and to create a show of vegetation through foliage, colour and fragrance. Thanks to the chromatic change of the foliage, the thickness and transparency of the crown, the varied forms and volumes, the vegetation will ensure the variety of the landscape, making the area more alive.

Key words: dendrologic study, environmental quality, improvement, landscape restoration, vacant land.

INTRODUCTION

There are many vacant lands in the country. These lands must be cleaned and the tree branches must be cut. No waste should exist there. These lands must be rearranged by finding the most efficient solutions.

Taking poor care of these lands has become a matter of public interest. In addition to bringing a negative impact on urban landscaping, they can also turn into real outbreaks of infection, endangering, in some cases, the health, life and safety of the citizens.

Municipalities can fine the owners, both natural and legal persons, who do not provide a minimum hygienisation of the lands by maintenance, disinfection and cleaning. Regular trimming of vegetation and disposal of wastes, by cleaning the storage places with the materials which are to be used, must also be provided. (<http://www.agerpres.ro>). The access routes should be cleaned too, by fencing the vacant lands and disposing of the wastes. The competent authorities must be notified

regarding the taking away of the stray dogs which could endanger the life and physical integrity of the people.

The area that was studied is located at the outskirts of Vilcea, being adjacent to the industrial area, where the University of Pitesti has a land as place of work (including buildings) which is used for teaching purposes. This area belonged to a former military unit in Vilcea. The land and the buildings related to the military base belonged to the Ministry of Interior and Defence. Our aim is to achieve one of the criteria of the sustainable development, those regarding the environment, by restoring the landscape that we propose.

The importance of this topic contributes, by its solution, to the improvement of the environmental quality and reduction of the sources of pollution.

MATERIALS AND METHODS

For completing the technical part of the work, following the recognition of the land and its

surroundings, for identifying the points within the geodetic network with known coordinates that allows the connection to the Stereo System 79 and provides the necessary precision, the following topographic equipment has been used: GPS SOUTH S86-T and Total Station Pentax W-822NX, using the RTK method - kinematic measurements. The work was done from four stations (Figure 1), due to visibility.

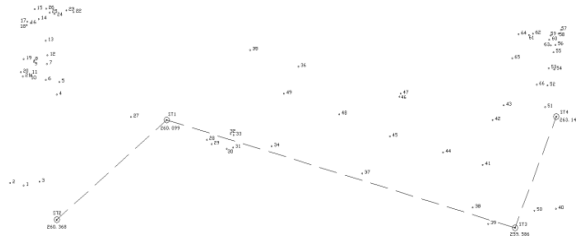


Figure 1. Sketch of the location of stations (sights) and offshoot points

The planimetric survey of the topographic details was done by radiation, the position of the characteristic points being determined. The results were verified through their integration into the tolerances required by the Office of Cadastre and Real Estate Publicity. The writing of the plan with X, Y coordinates was done at 1:1000, with specialized program ACAD, ensuring a high precision of calculations and graphical accuracy. For the classification of the area the ortophotoplan was used. One of the most important criteria for the implementation of the work was choosing the species of plants and landscaping style for the area that has been studied. In order to determine the species of trees and shrubs resistant to environmental conditions and microclimate of the area, a dendrological study was done, in which each species was briefly described with details regarding the ornamental importance, ecological requirements, scientific name, elements about origin and habitat.

RESULTS AND DISCUSSIONS

The area which has been studied has a surface of 72820 sq (Figure 2) and it encloses 23 buildings (Table 1). This area is part of a total surface of 11.8 hectares, cadastral number 14419.

Table 1. Data on existing buildings

No. construction	Built area (sq)	Name Construction
C1	222	PAV M6 Munition Storehouse
C2	228	PAV H Storehouse
C3	16	PAV Y2 Bodei
C4	138	PAV Y1 Bodei
C5	235	PAV H1 Storehouse
C6	218	PAV T Bodyguard
C7	322 (161 footprint area)	PAV C Sickroom
C8	212	PAV F1 Storehouse
C9	53	PAV L CL Station
C10	51	PAV O Post Trafo
C11	68	PAV U1 Control point
C12	3617 (1329 footprint area)	PAV B Headquarter In the current use of the University
C13	4	PAV L1 CL Station
C14	153	PAV Y9 Metal shack
C15	51	PAV G1 Pump Station
C16	52	PAV P1 Technical Point
C17	162	PAV R1 Storehouse
C18	93	PAV R7 Fire Protection Building
C19	43	PAV R2 Storehouse
C20	7	PAV R3 Storehouse
C21	367	PAV Y6 Enclosure
C22	565	PAV D Central Heating
C23	848	PAV N1 Workshop

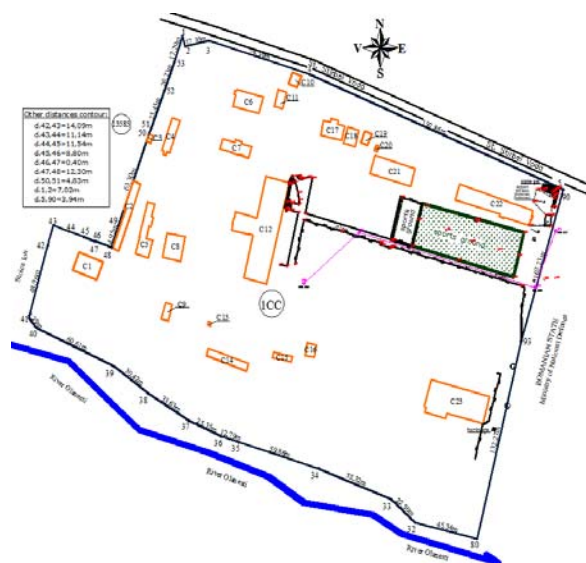


Figure 2. Reporting of the measured points and presentation of the studied site

Framing in the area through ortophotoplan (Figure 3) highlights the southern vacant land.













Figure 3. Framing in the area

The topographic survey revealed the following existing landscaping: pedestrian alley = 662sq (0.91%), parking = 377sq (0.52%), green spaces = 2136sq (2.93%), sports area = 2591sq (3.56%).

The vacant land area covers a surface of 17122sq (23.51%), with the proposal of getting rid of the metal shack C14. The dendrological study (Table 2) includes the surfaces in the corners of the C12 construction and the surface related to the pedestrian alley, taking into account that for marking the vertical rigid and monotonous lines of the building, groups of trees with columnar crown are planted in the corners. The main aim for the pedestrian alley is the decorative-recreative one. (Sofletea and Curtu, 2008)

Table 2. Description of the proposed species

Name	Characteristics
 Weeping willow <i>Salix babylonica</i>	A medium-sized tree (up to 15m tall), with long, flexible, glabrous shoots of yellowish-green colour. They must be planted in wet places, away of constructions, because their roots grow very fast and they are long and thick.
 Black locust <i>Robinia pseudacacia</i>	It is a tree up to 25-30 m tall with a dense system of root, a strain with early, thick rhytidome, deep and wide stitched, rare, bright crown. It has imparipinnate compound leaves and white, sweet-scented flowers.
Name	Characteristics

 Silver birch <i>Betula Pendula Lacinata</i>	A medium-sized deciduous tree with leaves that turn yellow in autumn. Resistant to frost, modest to soil fertility, it avoids the excessively wet and calcareous soils. It is not resistant to excessive drought.
 <i>Euonymus fortunei 'Emerald Gaiety'</i>	It has a slow growth, a height of 0,5-1 m. Requirements: well-drained soils, partial or partially shaded light, alkaline, acidic or neutral soils.
 <i>Abies alba</i>	Resin tree with a slow growth, a height of 50 m, the leaves are needle-like, flattened, green with white stripes. Requirements: fertile, wet soil, semi-shade, resistant to frost.
 Blue spruce <i>Picea pungens</i>	This resin tree has a slow growth and it is up to 40 m tall, needle-like leaves, that are dark green on top and have two long white stomata in strips below.
 Pine spruce <i>Picea abies</i>	Conifer tree that can be up to 50 m tall. It has a pyramidal-conical shape crown which is always green and dark green needle-like leaves.
 Magnolia <i>Magnolia x soulangiana</i>	It is also called sauce magnolia. It is a shrub of 7-8 m with obovate leaves, white, pink and purple flowers.
 Wistaria <i>Wistaria</i>	Strongly twisted roots, green stems, big, blue-violet, sweet-scented flowers grouped in pendent racemes of 15-20 cm, they blossom in May-June; large, soft pods, persistent on branches in winter.
 Lilac <i>Syringa vulgaris</i>	Part of the family oleaceelor and is a species that blooms in spring. It is a shrub whose height can be up to seven meters with straight branches and stems little edge. Odorous flowers from violet to purple and white.

From a functional perspective, by the proposal that was made (Figure 4), the anti-erosion part was ensured by the characteristic of the green

spaces to prevent erosion and degradation of rocks, to retain alluvial materials and to build up the shores of the water courses. From a decorative point of view, the green plantations improved one of the essential principles, namely the harmony, by linking the natural green spaces to the built spaces. In terms of health, the proposed arrangement contributes to the shaping the diurnal temperatures variations, increase of relative humidity of air, oxygen enrichment of the atmosphere, decrease of wind speed. All these features lead to the reduction of fatigue.

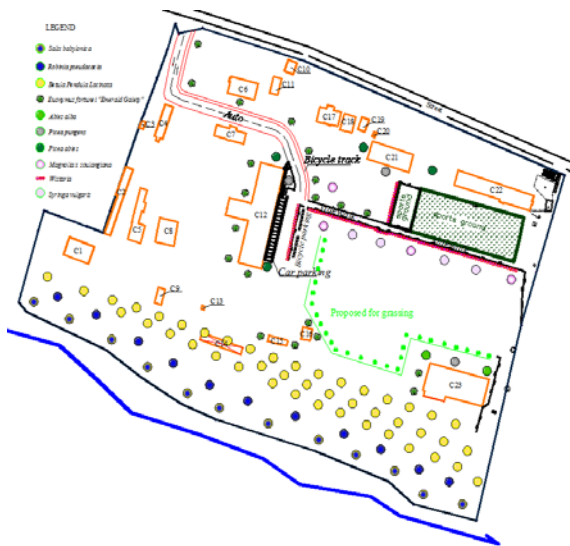


Figure 4. The layout of arrangement

Redevelopment project included alongside landscape restoration and resolution of access roads the malfunctioning by restoring auto route, resizing car park and the introduction of bicycle lanes and a corresponding parking (Figure 5).

CONCLUSIONS

The project proposed an arrangement of plants in a natural way so that it fixes the soil and also creates a spectacle of vegetation through foliage, colour and scent. The recommended species of trees and shrubs are resistant to

environmental conditions and microclimate in the area.



Figure 5. Detail of the arrangement

The chosen species have a great impact from an artistic point of view. The proposed arrangement leads to the harmonization of the built environment with the natural one, for the integration into the landscape and enhance of visual positive effects.

It shows up the buildings by directing the viewer, filtering the images and making of an interplay of light and shade, colour and texture. The work, through the solution it brings, contributes to the improvement of the environmental quality and reduction of sources of pollution.

We estimate of expenditure after achieving a necessary investment, the estimate must include the costs of maintenance. It will take into consideration the alternative fleet maintenance by students during practice. These are students of horticulture and those specializing in environmental engineering.

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