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THE CULTURAL LANDSCAPE OF NOWY WIŚNICZ
– A STUDY OF VISUAL EXPOSURE AS A BASIS FOR THE DEVELOPMENT
AND MANAGEMENT OF THE SURROUNDINGS OF THE CASTLE HILL

KRAJOBRAZ KULTUROWY NOWEGO WIŚNICZA
– STUDIUM EKSPOZYCJI JAKO PODSTAWA ZAGOSPODAROWANIA
I ZARZĄDZANIA OTOCZENIEM WZGÓRZA ZAMKOWEGO

Abstract

The landscape of Nowy Wiśnicz is a unique example of the preservation of Baroque cultural landscape. Changes in the manner in which the castle surroundings are used and a lack of care resulted in overgrown greenery which then began to interfere with precious spatial relations. The landscape currently requires intervention. Conservation has been protecting the site against investment plans. However, it must be integrated with active protection in the form of caring for the vast area in order to preserve the spatial meaning of the entire complex. A study of the exposure of the castle hill indicated further actions that are required for the landscape framework. With use of contemporary methods of a visual analysis, the main exposure links were identified. Two options of specific guidelines for land cover were then defined. These were considered with regard to the current state and then against the future state in the case of no intervention. These guidelines constitute the basis for further steps for the development and management of the surroundings of the castle hill.

Keywords: visual analysis, visibility degree, landscape legibility, Baroque landscape

Streszczenie

Krajobraz Nowego Wiśnicza to unikatowy przykład zachowanego barokowego krajobrazu kulturowego. Zmiany sposobu użytkowania otoczenia zamku i brak jego pielęgnacji spowodowały nadmierny rozwój roślinności, który zakłócił cenne powiązania przestrzenne. W chwili obecnej krajobraz wymaga interwencji. Ochrona konserwatorska zapewniła bezpieczeństwo ze strony zakusów inwestycyjnych, należy ją jednak zintegrować z czynną ochroną w postaci pielęgnacji rozległego obszaru w celu zachowania wyrazu przestrzennego całego zespołu. Studium ekspozycji Wzgórza Zamkowego wskazało krajobrazowe ramy dalszych działań. Za pomocą współczesnych metod analizy widokowej zidentyfikowano główne powiązania ekspozycyjne. Następnie określono szczegółowe wytyczne dotyczące pokrycia terenu w postaci dwóch wariantów ukazujących je na tle stanu obecnego i stanu jak nastąpi w wyniku braku interwencji. Wytyczne te stanowią podstawę dalszych kroków mających na celu zagospodarowanie i zarządzanie otoczeniem wzgórza zamkowego.

Słowa kluczowe: analiza widokowa, stopień widoczności, uczynienie krajobrazu, krajobraz barokowy

1. Introduction

The notion of cultural landscape contains the word *culture* which stands for cultivation¹. A lack of cultivation and care leads to natural processes returning the landscape to its original condition. These processes take on a form of secondary natural succession, i.e. gradual changes of forms of shaping and covering as subsequent stages proper for the conditions of a given place. In Poland, this is common practice and results from both natural and cultural transformations, including *atlantisation* of climate or reducing the existing active agricultural use (Fig. 1).

This process does not spare protected areas and this is demonstrated in significant transformations that lead to the loss of legibility of past landscape assumptions. The landscape of Nowy Wiśnicz has fallen prey to this phenomenon. A high number of forms of protection for the castle and its surroundings have failed to protect it from the significant weakening of landscape values [20]. Little interest in the surroundings of the site results in the advancement of processes which led to the deformation of the local cultural landscape and created a situation of conflict between the protection of the natural environment and the protection of the site of historic value [10]. The accumulation of uncontrollable phenomena currently makes it difficult to provide adequate protection of the historically valuable site and it requires immediate regulation. The initial step for outlining the framework for action was a study of visual exposure of the castle hill. It was aimed at defining the main visual links and the possibilities for making them more readable. It outlined the spatial framework for further work while identifying the conditions for achieving a specific landscape effect in the form of guidelines [21].



DO NOTHING SCENARIO



OPTION I

Fig. 1. A study of visual exposure to identify possibilities of making the castle hill more legible in the landscape of Nowy Wiśnicz [21]

¹ The word *culture* originates from the Latin word for *cultivation*, i.e. *Kultus agri* – agriculture

Materials–transformations of the cultural landscape of Nowy Wiśnicz

The landscape of Nowy Wiśnicz is a unique example of the preservation of a Baroque cultural landscape. It is based on a trio of the castle, the monastery, and the town, and it reflects the ideas characteristic of its époque. This unique combination covering a considerable area has been preserved in exceptionally good condition. Although it has been slightly transformed, it remains a balanced composition with a clear spatial message [9]. The story of settlement in Nowy Wiśnicz goes back to medieval times. Its form took on a special meaning in the seventeenth century when the castle was surrounded with fortifications based on a pentagon. The fortifications were designed and built on a grand scale with five bastions and curtains. This redevelopment made Wiśnicz one of the strongest noble fortresses in Poland at that time [7,8,9]. Cartography and historical iconography shows the former method of managing the surroundings. The residence was initially surrounded by lavish gardens and animal compounds [15]. When the times of the former grandeur were over, distinctive forms of outstanding architectural and cultural items remained landmarks in the local landscape and defined it in accordance with their own composition rules. A wide context in the form of arable land exposed the whole complex comprising the castle, the monastery, and the town while providing a strong basis for the dominants [8,9]. Reducing agriculture which has been observed for several decades now is gaining on strength in the contemporary landscape of Wiśnicz. This pulling back and reducing the agricultural area has gradually given in to natural succession. Although transforming parks and animal compounds into arable land did not have a significant impact on the basic spatial structure, growing trees are making its visual impact weaker and might even make it invisible.



Fig. 2. The beginnings of planting forest on the slopes of the castle hill; photo by A. Bochenek, 1918; archives of OT NID in Kraków



In the interwar period, there were spruce planted on the hill slope facing the town (Fig. 2). Growth of these evergreen species permanently transformed the character of the hill. They have become a key element of the landscape while having an impact on the visual perception of the castle itself. This seemingly insignificant intervention is marked strongly today in the hill's exposure. The trees that are present there in accordance with the habitat are predominantly deciduous. They are characterised by change in accordance with the seasons. They become semi-transparent once they lose their leaves. Moreover, they usually have a positive influence on the slopes by strengthening them with their roots. The spruces were planted deliberately. They have adverse effects on the greenery in their proximity and introduce a permanent cover for the castle regardless of the season (Fig. 3). Furthermore, spruce trees might have a very negative impact on the stability of the slopes [13, 14].



Fig. 3. Transformation of the landscape of the castle hill. View from Mickiewicza street [21]

The development of flora has prepared a good basis for favourable conditions for fauna. They have proven to be so beneficial that there is currently a large population of the lesser horseshoe bat, which is under constant observation. Because of the lesser horseshoe bat habitat, the area has been protected under the Natura 2000 project.

Despite many years of negligence, the spatial complex of Nowy Wiśnicz still possesses the model characteristics to be one of the greatest and best preserved landscapes of its era [9,20]. Currently, it qualifies for conservation and the castle plus its surroundings have been listed in the register of objects of cultural heritage in the Małopolska province. It is also included in the area register of the urban design of Nowy Wiśnicz. In the existing spatial development plan, it is listed within the area of strict and indirect conservatory protection² [19]. Furthermore, it is located in the Wiśnicz-Lipnica Landscape Park as well as the area covered by Natura 2000 Nowy Wiśnicz. As a result of existing forms of protection, it was not irreversibly destroyed by new construction investment; neither was it deformed or irrecoverably disrupted. Due to studies and conservation works that have taken place over the years, the objects have

² The castle hill and the castle itself were already under protection in the interwar period. The decisions from 1930 and 1936 confirmed the castle's value on the heritage site list when placing it there together with its surroundings. After WW2, it was listed there again on 17 May 1947. The castle with the surroundings were present in the register of the heritage sites of the former Kraków province. The castle is also a part of an entry into the spatial urban layout of Nowy Wiśnicz, under decision from 27 July 1976.

been preserved in good condition with no significant changes of form or layout. However, conservation works focused mainly on the buildings which resulted in effective protection and the current state of preservation of the buildings [7, 8]. However, in the case of the surroundings, neither the gardens nor the greenery composition have ever been subject to this kind of care. These were limited to an entry in the register of protected areas to keep them safe from construction investment [17–19]. However, a lack of active protection froze the area in terms of any resources for its proper management [16].

Passive area protection failed to stop natural processes that were missed by static planning records. In the place without proper care, the role was taken over by the nature and more or less successful actions of the managers of this area. The current direction of the landscape changes of the castle hill calls for intervention and long term management. This activity must be based on the conscious shaping of greenery taking into account both natural and cultural qualities.

2. Study method for exposure of the castle hill

A study of the visual exposure of the castle hill in Nowy Wiśnicz in terms of its greater legibility in the landscape [21] was conducted in order to outline the spatial framework for future activity. The study was designed to determine the possibilities for restoration of the visual exposure of the castle hill while preserving its natural qualities. The research was based on an active and passive exposure analysis as well as panorama and cross section analyses. The coefficient of the visibility degree [4,5] was used for verification of the findings. The results were presented as plans and visualisations. The research was conducted on the basis of the digital model of the terrain (DTM) and the digital model of the land cover (DLM) [11, 21]. Additionally, the body of the castle and its surrounding fortifications also required modelling to facilitate detailed research regarding the visibility range of the building. An analysis of passive exposure allowed identification of areas within the visual range of the studied object. An analysis of active exposure allowed locating exposure elements in the form of points, sequences, and visual planes [2]. An on-site inspection, historical materials and their verification became the basis for the prioritisation of elements of active exposure which led to singling out key, specific and complementary elements [5].

The prioritisation of elements of active exposure became the basis for locating the main directions of this exposure. These directions set the lines for cross sections across the terrain which then became the basis for defining acceptable sizes of land cover. As a result, a map was designed to define the acceptable sizes of forms of the castle hill cover. The findings were either presented as two options or as two phases of activity O1 and O2. An analysis of exposure and the range of greenery correction strategies defined there were verified with use of the coefficient of the exposure degree which determines the tangible effects of the transformed exposure in the form of charts, diagrams, and figures [4, 5]. This analysis was supplemented with panoramas [1]. The work was simultaneously performed on the plans, cross sections and panoramic views. As a result, the panoramas illustrate the existing state, the state that would occur in the case of no intervention and two options of care activity (O1 and O2). Presenting



the future state in the case of no intervention, the so-called *do nothing scenario* is a reference point commonly used in landscape research methodology when the subject of research is living matter in the form of natural land cover, the condition of which being subject to change [5]. The depiction of the future state in the case of no intervention takes into account the continuation of processes that have already begun and it clearly presents their results [6]. A time horizon of ten years has been adopted for the purpose of the study.

3. Research results

3.1. Passive exposure

The exposure of the castle hill is highly diverse; it changes depending on the location of the observer. This results from the complex topography of the hill, the different green cover and the very body of the castle that is shaped differently in different parts. An initial analysis confirmed in the model study demonstrated the most favourable views to be from the north to the west and with a slight move towards the south west (Fig. 4). These are mainly the exposures that link the castle to the town. Putting together the area from which the castle is seen with the possibility of observing this view from a network of roads, routes and paths used by people allowed us to define elements of active exposure from which one can see the castle. An initial visibility map for selecting elements of active exposure was prepared for the castle towers. In order to improve legibility of the castle in the landscape in terms of its full

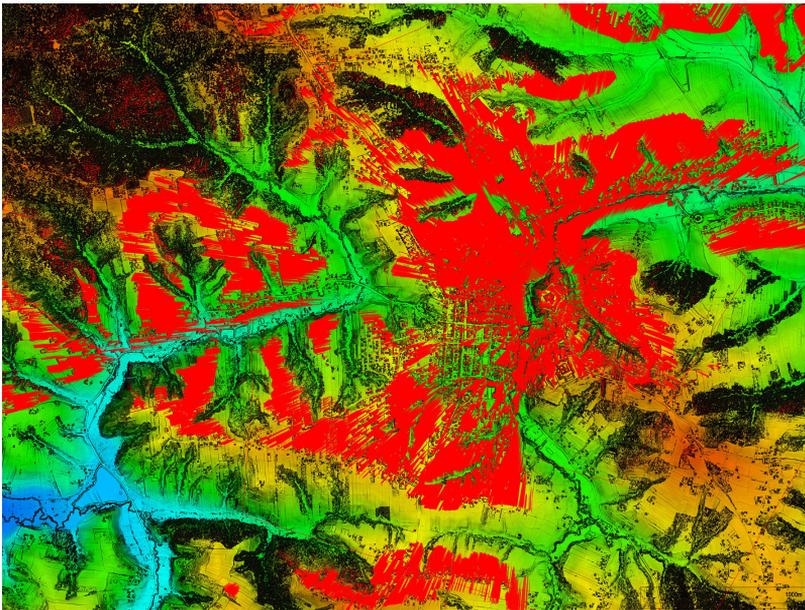


Fig. 4. Total map of visibility of five castle towers developed on the basis of the numerical terrain model [21]

form, i.e. the spectacular expansion of fortifications in the seventeenth century, the visibility study included the bastions. Exposure possibilities related to the topography, the shape of the hill and the shape of the bastions with curtains gives the highest exposure potential to the western curtain with the bastions around it. It is facing the town. Legibility of this part of the fortifications can be ensured provided there is visibility of the curtain peak and a piece of light wall up to a layer of stone fortifications slightly beneath the cornice. This is the line where the visibility checkpoints were placed for studying their exposure possibilities.

A visibility chart developed on the basis of the terrain model also formed the basis for further studies related to the acceptable level of greenery and the exposure results of greenery correction in the castle surroundings.

3.2. Active exposure

In terms of the viewshed of the bastion fortification line, we located elements of active exposure in the form of points, sequences, and visual planes. These elements were analysed in the context of historical visual approaches, the current state, and landscape transformations. Their gradation was completed on the basis of a comparative analysis. Key, specific and complementary elements were identified. Special attention was paid to visual points because of further stages of works. Cross section beams were introduced as key points. On this basis, a visualisation of the current state, the *do nothing scenario* state and the design stage were prepared in two options O1 and O2 (Fig. 5).

3.3. Panoramas

An integral part of visual studies is the study of panoramas [1]. In the case of passive exposure of the castle hill, panoramas constitute a key element of the analysis while visualisations are a major method for presenting the results. The following were presented as panoramas: the current state, the *do nothing scenario* state, the options of exposing the castle hill in a minimal form (O1) and an optimal form (O2).

Panoramas were prepared in the form of a catalogue of key points with a larger summary of the above four options narrowing it down to the castle hill. Moreover, the document entitled *Study of the exposure...* [21] presents views from these points at full panorama widths [12]. A summary of the panoramas in different options clearly shows the need for undertaking some form of activity. Additionally, a map of acceptable heights was used as a source of data for preparing and supplementing the options. The map supplements the panoramas and the plan indicates what height ranges of cover in particular parts of the slope would guarantee visual effects visible on the panoramas (Figs. 6, 7).



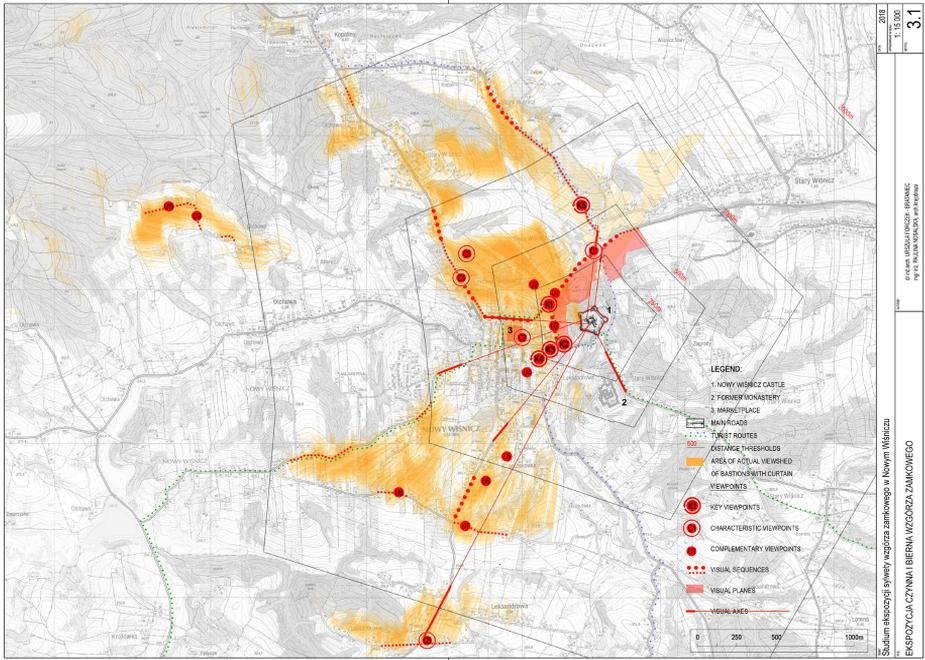


Fig. 5. Elements of active exposure on the map of visibility of the western bastions [21]



Fig. 6. The full panorama width in three options: the current state, the options of exposing the castle hill in the minimal form (O1) and the optimal form (O2) [21]

IV P
III P
II P
I P

CASTLE



CURRENT STATE



DO NOTHING SCENARIO



OPTION I



OPTION II

Fig. 7. Catalogue of panoramas - key point 3 visualisations of scenarios of options of guidelines: the current state, the *do nothing scenario* state, the options of exposing the castle hill in the minimal form (O1) and the optimal form (O2) [21]



3.4. Cross sections

The prioritisation of visual points became the basis for preparing a map of the acceptable height of land cover which constitutes the condition for making the castle fortification more visually readable. This map was developed on the basis of detailed cross section beams. The first study of the map was prepared on the basis of key points. Line beams were drawn from the key points and directed towards the exposure object (Fig. 8A). The lines marked the location of cross sections that were generated from the terrain model. These formed the background for the first study of the acceptable height of elements of land cover. For a clearer view from the key visual sequence of Podzamcze street, the first study was supplemented with another layer of data (Fig. 8B). Placing both layers of data resulted in a map. The parameters ensured exposure both from the key points and the key visual sequence at Podzamcze street. The map shows the acceptable sizes of cover elements as levels.

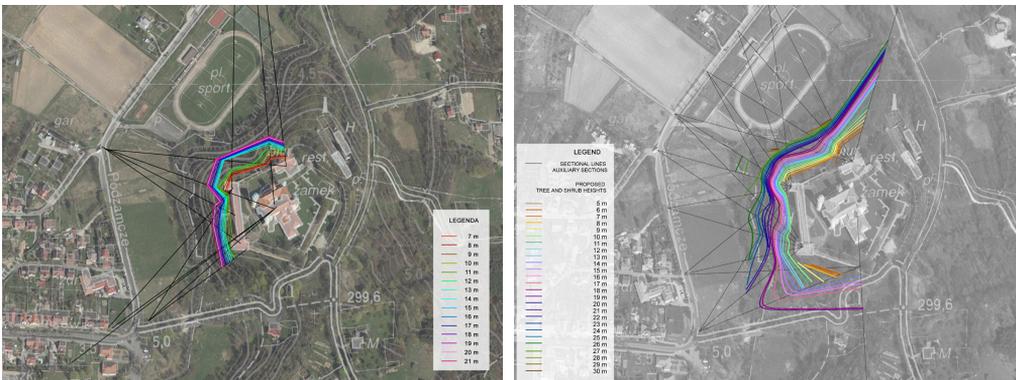


Fig. 8. A – The first study of acceptable terrain cover height based on views from key points, B – The second study taking into account the view from nearby visual sequences [21]

3.5. The degree of visibility

The degree of exposure is a factor that allows us to measure the effects of actions for correcting the visibility of certain elements. It is a tool for gaining more detailed information in relation to the viewshed. This is because the viewshed indicates the area from which a given object or a part of the object is visible. The visibility degree gives us information regarding whether or not the object is visible as a whole or just partially³.

This is key information in relation to line and surface objects. In this case, the studied degree of exposure was of the western curtain with bastions around it. In order to obtain the data related to the exposure of the most attractive part of the fortifications, facing the

³ A method of studying the degree of visibility was applied numerous times when working on exposure of line elements. A summary of this research can be found in *Visible space. A visual analysis in the landscape planning and designing* [5].

centre of Nowy Wiśnicz, a sequence of checkpoints was placed on the wall. The beginning determines the coefficient for potential visibility and hence its threshold. Next, the degree of exposure of the current state and the designed state in options O1 and O2 was calculated. The degree of visibility shows what wall length would be visible from a given area. The degree of visibility '0 VD' indicates full shade. From the area marked '0', no part of the studied object would be visible. On the map, this area is marked in black. The degree of visibility '5 VD' means that from this area, the wall would be visible in full over its entire length. Intermediate values successively show which part of a studied element would be visible. Areas marked '4 VD' means that it will be over three-quarters of the length of the studied element; degree of visibility '3 VD' means that from a given area, over half but no more than three-quarters of the wall would be visible. Areas marked '2 VD' means that less than a half of the wall would be visible but no more than one quarter. As a result of the above, 1 VD means that the wall would be visible from this area but less than one quarter of it. An analysis of potential exposure, i.e. visual possibilities that are characteristic of this part of the fortification, would yield data regarding the maximum degree of visibility of this object. The largest possible area with the possibility of viewing the wall is the area of its potential exposure. For a greater clarity of data, the calculations assume that it constitutes 100%. Because of this, any further measurements of visibility indicate the percentage of visible space against the one that can be seen.

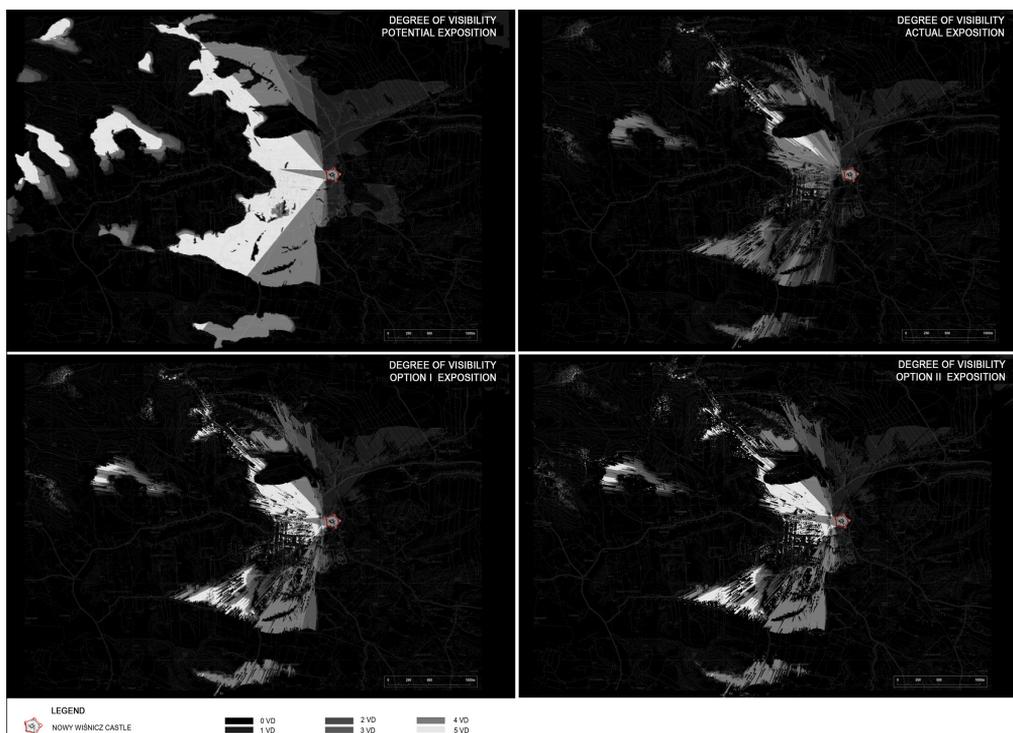


Fig. 9. Boards presenting the degree of exposure A-for potential exposure, B - for the current state, C - for option O1, D- for option O2; colour markings ■ 0VD, ■ 1VD, ■ 2VD, ■ 3VD, ■ 4VD, □ 5VD

On the basis of the determined degree of visibility, every place on the map located within the study range is identified with regard to the visual impact of a studied element. In this way, one can precisely indicate the changes that will take place in the visibility of the bastions and curtains, on the market surface, at key points, or in sections of visual sequences. When comparing the analysed options, we can observe much greater visibility of the curtain and the bastions for the second option. The fourth and fifth degree of visibility covers a larger area, which means that the entire studied line as well as more than three-quarters of its length will be visible from 20% of the analysed area, while option 1 indicates only 14%. A larger area from where the fortifications will be visible translates directly into their better legibility in the landscape (Fig. 9, Table 1).

Table 1. Analysis of exposure degree for options O1 and O2

Visibility degree	0 VD 0	1 VD 0-1/4	2 VD 1/4-1/2	3 VD 1/2-3/4	4 VD 3/4-1	5 VD 1
A) Potential exposure	0%	28%	5%	7%	25%	35%
B) Real exposure	55%	28%	4.5%	5.5%	6.5%	0.5%
O1) Option 1	53.5%	26%	2.5%	4%	8%	6%
O2) Option 2	53%	17.5%	5%	4.5%	12%	8%

4. Conclusions

4.1. General conclusions

The case of Nowy Wiśnicz draws attention to the need for the continuous protection of both historic value sites and their surroundings. The significance and value of the site as well as the preserved landscape requires adequate exposure in order to highlight its greatest values in the urban space. Many years of negligence and wrong decisions by the management of the terrain surrounding the castle have resulted in the transformation of the cultural landscape and, consequently, the gradual reduction of the exposure of the castle in the landscape of Nowy Wiśnicz. An analysis of archive materials in the form of iconography has fully justified undertaking activity for making the castle and its surrounding fortifications that constitute an integral whole in the form of a Baroque fortress more readable. An analysis of the planning data forms the legal basis for intervention since the object is located within an area of strict protection. It is also surrounded by an indirect protection zone. This data matches the zones of exposure protection where the view of the castle hill is the subject of the utmost attention. Available data in source materials regarding the natural environment and the greatest concentration of bat flight routes prove that the area that requires redevelopment of afforestation is located within a certain distance from the main cluster of flight corridors. The proximity makes terrain development possible which in turn makes exposure more readable

and safeguards suitable conditions for the protected species. Other natural qualities in the form of compliance with the habitat and the issue of stability of the slope provide support for the local redevelopment of afforestation and hence its improvement (Fig. 10).

4.2. Conclusions from the visual analysis

As a result of the conducted research, exposure elements were located in the form of points, sequences, and visual areas. These are sites from which exposure is still the most attractive. Due to the gradual expansion of development and the disappearance of many former visual connections, these elements require specific attention and protection. This is also justified in the *do nothing scenario* covered in the analysis. It demonstrates visual effects of further failures to provide care, which indicates the necessity to take immediate steps.

As a result of the analyses, two options of intervention were developed in order to restore the castle hill crowned with a world class monument. The presented options could be treated as the first and second phase of actions. The first option (O1) determines the minimal range of greenery correction that enables partial exposure of the castle and minimal exposure of the fortifications. These works should be completed as soon as possible. They are vital due to their visual values and also because of the risk of the deepening erosion of the hill caused by expansion of the spruce trees. The second option (O2) is the target state that is to be achieved when conducting care works of the castle hill. It constitutes the second phase of protection activities. It determines the permitted height of the base layer of the cover in the surroundings of the castle. Moreover, it defines zone of exceeding the height dimensions, the zone of absolute prohibition of exceeding the land cover height as well as a special zone adjacent to the site for the bat flight routes.

Option 1 includes the removal of the spruces and other trees that are closest to the fortification walls from the north. This is a minimal strategy, and is aimed at stopping the process of covering the hill from the city with a dense number of evergreen trees. Both in summer and in winter, they are like a tight veil which has been increasingly limiting the visibility of the castle over recent years. The northern side has been selected as the key view. Due to the configuration and thick growth of trees closest to the bastions and curtains by the walls, the castle is almost completely covered. The trees present there are mainly deciduous; therefore, in winter the castle is visible through them and it is clear that its further uncovering requires only small corrections. Removal of the spruce trees as proposed in option 1 is necessary not only for visual reasons but also for the stability and durability of the slope. Spruces are types of trees that facilitate erosion. They have a shallow root system, while the proportion of the overground component to the underground parts poses a great threat to the stability of the slope. Therefore, it is recommended that a method of tree removal be planned for taking into account a permanent method of its implementation. It is essential that the total removal of greenery from the terrain is prohibited as there is a risk of deeper erosion.

Option 2 proposes the major reconstruction of greenery on the hill while indicating acceptable height of different land cover types. This is the target option for the basis of development of the design of the castle hill with regard to continuous reconstruction



of afforestation. This option includes the following: the concentration of activity in the western part of the hill due to the main direction of its exposure; preservation of greenery in the eastern part would provide the background and unmodified natural conditions for the population of bats living in the castle; moving plantings five metres away from the wall; shaping the main green mass on the basis of the limits of height levels arising from the visual analysis; preserving marshy meadows at the foot of the hill; preserving the most precious greenery, natural monuments and introducing groups of vegetation necessary for maintaining and strengthening wildlife corridors, i.e. corridors for bat movements. The visualisations present visual effects for the implementation of both options in the form of key panoramas. The coefficient of the visibility degree prepared for them demonstrates the surface level of changes in the exposure. It shows which part of the western fortification would be visible from particular points in the surrounding terrain.

A detailed visual analysis allowed us to define the conditions for making the castle hill more readable. The findings are presented in numerical form, in the form of maps and clear visualisations of the design state. The *do nothing scenario* state is also considered. Additionally, the study contains detailed guidelines regarding land use as well as composition and technical guidelines for the design of the greenery development. Further stages of proceedings were prepared in the form of: 1. a detailed greenery design preceded by several necessary source

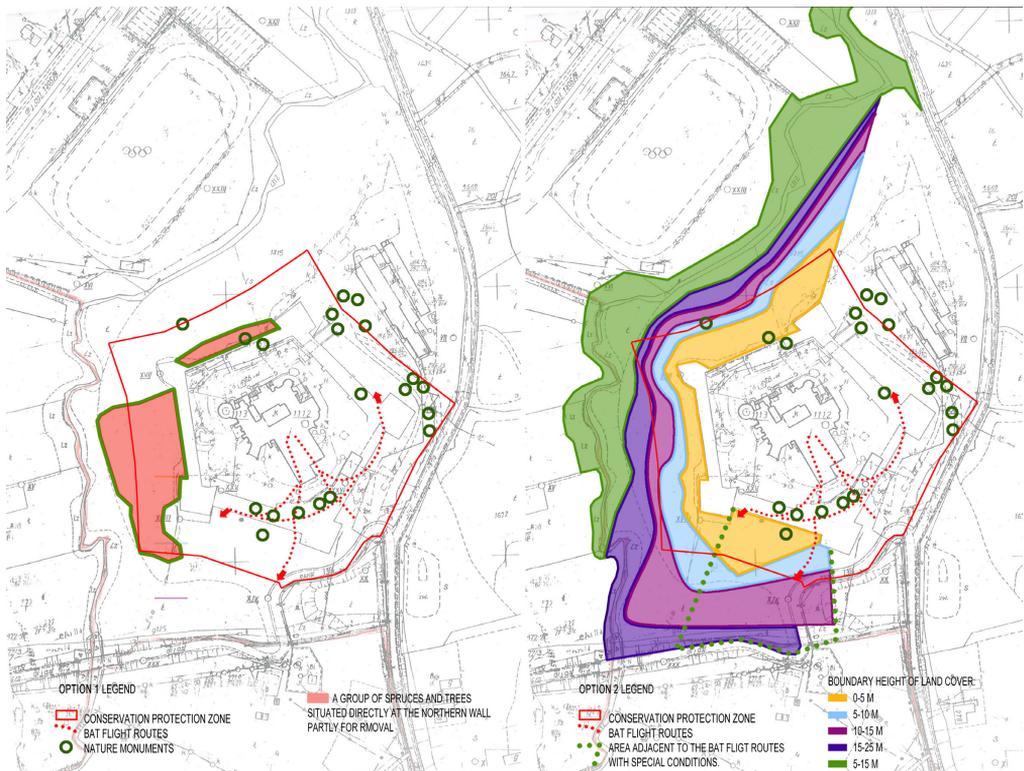


Fig. 10. The first and second option of the intervention to make the castle hill more readable [21]



Fig. 11. Guidelines for designing greenery development[21]

materials, such as a greenery inventory, and an analysis of the degree and type of erosion on the hill; 2.a specification of major bat habitats and flight zones. Collecting this data indicates the most valuable trees, the sites requiring utmost precaution in terms of erosion, and areas that are sensitive due to the presence of bats.

The guidelines define the threshold for terrain cover but the above-mentioned arguments make it possible to exceed this threshold in some areas. As a result, necessary conditions for the integration of protecting the natural and cultural values are ensured while the safety and stability of the slopes is preserved (Fig. 10).

5. Summary

The landscape of Nowy Wiśnicz represents a considerable number of cases in which the protection of a historic value site fails to go hand in hand with the protection of its surroundings. This is proof that even in the existing legal framework the passive approach to protection can be harmful or even pose a threat to the place of historic value itself as a result of uncontrolled processes, such as the erosion of natural succession. As a result of the gradual overlapping of these phenomena, the protection of a landscape complex of historic value takes on the form of multiple multifaceted issues which include contradictory grounds

for situations of conflict. Lack of a clear strategy prolongs the whole process which in turn poses a threat for the whole site of historic value.

Taking the decision to prepare *Study of exposure...* [21] in this case opened a discussion and helped set out an action plan for the future. An analysis of the visual exposure covering both close and distant views set out the necessary spatial frames for the desired landscape effect. As a result of this, the implementation of further steps in the form of development and management that takes into account both natural and cultural values will enable obtaining the appropriate landscape framework.

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