

# COMPOSITIONAL-AESTHETIC EVALUATION OF THE VEGETATION IN RELATION TO BUILDINGS

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## Abstract

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The aim of this work is to evaluate visual facilities of a landscape design, which include dimension, shape, colour, texture, proportionality, structure and dominant. It is an attempt to objectively evaluate the basic combinations of architectonical and vegetation fragments. It is generally focused on vegetation areas with several functions; there are only dissimilarities in the determination of criteria needed for the evaluation and for the suggestion of existing composition. The methodology was based on a model area in front of the Regional Court Building in Nitra. Based on a visual feature evaluation of the architectural elements and overgrowth, from the perspective of the aesthetic effect of composition, it was discovered that the landscape design partly performs an aesthetic-representative function. Proposals are aimed at supporting and emphasizing the elements with appropriate attributes, which were variously marked as: “convenient dominants,” to “complement the dominant,” or to “change the proportionality of elements and to change the visual features of landscape design.”

*Key words:* visual facilities, structure, landscape design, aesthetic function

## Introduction

Woody plants together with other plants (grass areas and flowers) are essential components of landscape design. Urban additives are also a part of urban landscape design. From an artistic point of view, they are volume components with various visual features (Finka, 1994). Authors evaluate the quality and quantity of vegetation from several points of view. For example, the attributes of vegetation structure in aesthetic-representative arrangements of family houses (in front yards) and in different types of built-up areas were elaborated by Rózová (2003). Kuczman (2006) evaluates the picture of rural residences based on a three-dimensional analysis of components with both abiotic and biotic character. Pauleit (2001),

at the framing evaluation of vegetation in urban settlements, makes provision for spatially-planning structure and phytosociological, social, environmental and human aspects.

It was necessary to create a methodology, which would evaluate objectively the combinations of architectural and vegetation constituent facilities. Therefore, this work has a methodical-applicative character and is focused on evaluation of the visual attributes of landscape design, such as dimension, shape, colour, texture, proportionality, structure and dominant. The methodology has been formed from Machovec's (1987) work flow (woody plans inventory), Machovec et al. (2000) (landscape design and architectural woody plants evaluation), Rózová (2003) (overgrowth structure valuation), Supuka, Feriancová (2003) (Compositional-aesthetic and environmental aspects of dendrological structure in urban greenery), Kuczman (2006) (the country residence picture evaluation following the three-dimensional analysis of components with abiotic and biotic character, Pauleit (2001) (vegetation evaluating in urban settlements) and complemented with a new evaluation of some aesthetic attributes, so that was possible objectively, to value landscape design with aesthetics and representative functions. The methodology was attested on a model area with an aesthetic-representative function in front of the Regional Court Building in Nitra, which consists of vegetation, architectural elements and the urban area (approach road, historical building).

## **Material, methods and results**

The designed area is situated in the historical centre in the Dolné mesto part of the city of Nitra. On the basis of the methodology, and the determination of the visual vulnerability potential in landscape (Petluš, Vanková, 2008), this surface has very markedly low potential of visual vulnerabilities.

It is surrounded by a sidewalk for pedestrians, a parking lot and a road. It is an aesthetic-representative garden landscape, situated before the significant Regional Court Building in Nitra. This is a historical building dating from 1903, and is characteristic of breakthrough neostyle and modern styles (Figs 1, 2) (Dulla, Moravčíková, 2006).

In the past it served as the Hall of Justice. Today it is performing its primary function. The adjusted area has a 3000 m<sup>2</sup> surface, and a rectangular shape; in the centre is situated a round fountain surrounded by benches and completed with mobile greenery with annual plants. The mobile greenery is also bordered by an entry sidewalk to the fountain. The landscape design is symmetrical. It is formed by broadleaved species, coniferous species and shrubs, complemented by a maintained, but not quality-class grass plot.

### *Analytical and methodical approach and results*

Analysis was focused on the architectural elements (building, small architecture elements, reinforcement surfaces, wing walls, art elements etc.) and vegetation elements (trees, shrub and grass-plot).

Elements, groups and entire overgrowth were observed on the basis of the following visual features that are needed for the evaluation of the landscape design composition, filling an aesthetic-representative function:

- aesthetic: texture, colour, height, shape, dominant, landscape balance (Mikulová, 2009),
- structural: foliation, species diversity, crown density, cover (Rózová, 2003).



Fig. 1. The landscape design in front of the Regional court in Nitra in 1919 (archive Krčmár).



Fig. 2. The landscape design in front of the Regional court in Nitra in 2009 (Photo Mikulová, 2009).

## Visual facilities of architectural elements analysis

The following architectural elements are situated close to the Regional Court Building in Nitra: judicial building, fountain, paths, parking lot with the road, benches, flowerpots, wing walls and lights. The matter, from which the elements are made, are mostly wood, concrete, metal, stone and asphalt. Predominating colours are grey, grey-black, blue, and tawny. The majority of the architectural elements have a maximum height of 0.5 m (the highest and most superficial). The largest is the judicial building at 20 m. Predominating in the landscape design are quadratic, linear, rectangular, cylindrical and pillar shaped elements. Architectural elements are generally reflecting features of the dominant with colour (the building and the fountain) and dimension (altitudinal dominant – the building, superficial dominant – the parking lot with the road).

## Overgrowth attributes analysis

The overgrowth attribute analysis arises from the vegetation elements facility analysis. The overgrowth has more than six objects, and is formed with arboriform, scrubby woody plants and grass. There are not situated any flower beds; there is just mobile greenness with annual plants. The texture of the overgrowth is very varied, and implies leafy species with large leaves, but with weak leaf area (*Acer platanoides* L.), densely overgrown, tenuous minor leaves (*Betula pendula* Roth., *Berberis thunbergii* DC. 'Atropurpurea', *Spiraea x vanhouttei* Zab.), and coniferous tree abundance (*Picea pungens* Engelm. 'Glauca', *Pinus strobus* L., *Pseudotsuga menziesii* (Mill) Franco, *Taxus baccata* L.). The overgrowth is multi-coloured all year round, but the neutral green and silver colour of leaves predominate, spring flowering is plain (flowers are green-yellow, yellow, white), the autumn effect is not very expressive (only yellow and orange colours are appearing). The fruits of woody plants, which are in the overgrowth, have also less attractive colours (brown, red, black, brownish-yellow and green-yellow, red-yellow). The trees generally rise more than 10.1 m; shrub height is mostly over 2.6 m and grass is about 10 cm high. The wood's shape in growth is natural (*Acer platanoides* L., *Betula pendula* Roth., etc.) and represented by a particular form (*Sophora japonica* L. 'Pendula' – umbrella shape); the ground plan is rectangular. There are two types of dominants-shapes, *Sophora japonica* L. 'Pendula' (umbrella shape), and the coloured *Picea pungens* Engelm. 'Glauca' (silver needles). Both are not very expressive in their features, because growth is dense and dominant facilities are pressed. Vegetation elements are in symmetrical harmony. Overgrowth has tree etages (grass, shrubs and trees), and the species amount is 12. The tree crown density is above 80% the crown density of shrubs is under 49% and the grass area is covered by more than 80%. The tree growth on plot use is over 60% of the surface, shrubs use 0–19% and grass is situated in tree undergrowth and in open areas, occupying 0–19%.

## Evaluation methods and results

Each of analyzed features has been divided by synthesis into following three groups with point importance, which expresses the suitability of the features for the harmonic effect of composition (Figs 3, 4, Tables 1, 2):

- groups of features with harmonic effect (3 points),
- groups of features with partially harmonic effect (2 points),
- groups of features without harmonic effect (1 point).

Preafatus groups are used in objective state evaluation of vegetation area by creating the following categories of suitable feature combinations (Table 3) for aesthetic function:

- landscape design performs aesthetic-representative function,
- landscape design particularly performs aesthetic-representative function,
- landscape design not performs aesthetic-representative function.

Among the dominant and the other architectural and vegetation elements, the proportionality has been also evaluated. The proportionality is following from analytical features (the height, the surface and the distance) by using the rule of divine proportion. The next step was to create the criteria from the features' combinations on the basis of the representative area landscape design keystones, which provide objectively valuation of concrete landscape design composition (in this case the Regional court in Nitra).

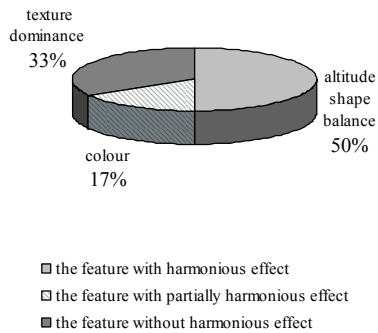


Fig. 3. Perceptual representation of architectural elements features near the Regional court in Nitra on the part of harmonic effect.

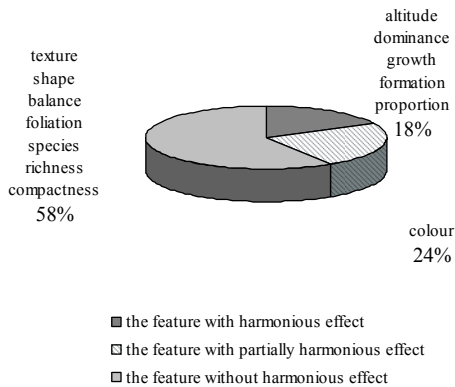


Fig. 4. Perceptual representation of vegetation elements features Regional court in Nitra on the part of harmonic effect.

### Proportion evaluation of components in composition

The architectonic dominant in the area is the historical building of the Regional Court in Nitra, whose height is 20 m, and a round fountain, whose distance is 15 m. The vegetation dominant of shape (overhanging sort of *Sophora japonila L. 'Pendula'*) is, in distance, 37 m. The high vegetation dominants (*Picea pungens Engelm.*) are, in distance, 30 m from the building. The parking lot width with the road, which is dominant in surface, is 17 m and the vegetation area width is 28 m. On the basis of divine proportion theorem, the other dominant optimal distance from the courthouse is 32.3 m, the optimal components height near the courthouse is 7.6 m, and vegetation growth width to the parking lot and road reinforcement surface is 27.5 m.

The result of the calculation is that the fountain is a rival to the courthouse, whose distance is less than 32.3 m. The inept vegetation elements are those that superimpose the courthouse. They are *Picea pungens Engelm.*,

T a b l e 1. The items up evaluation of the particulars visual features of architectural elements in the landscape design near the Regional court in Nitra on the part of harmonic effect.

Existing area	A	B	C	D	E	F	altogether
1.	1	2	3	3	1	3	13

- 3 points**      The feature with harmonious effect
- 2 points**      The feature with partially harmonious effect
- 1 points**      The feature without harmonious effect

Notes:

- A – texture              D – shape
- B – colour                E – dominance
- C – altitude              F – balance

T a b l e 2. The items up evaluation of the particulars visual features of growth in the landscape design near the Regional court in Nitra on the part of harmonic effect.

Existing area	Spring		Summer		Autumn		Winter		C	D	E	F	G	H	I	J	altogether	
	A	B	A	B	A	B	A	B										
1.	3	2	3	2	3	2	3	2	1	3	3	1	3	3	3	3	1	41

- 3 points**      The feature with harmonious effect
- 2 points**      The feature with partially harmonious effect
- 1 points**      The feature without harmonious effect

Notes:

- A – texture              D – ground area shape      H – species richness
- B – colour                E – dominance                I – compactness
- C – altitude              F – balance                    J – growth formation proportion
- D – crown shape      G – foliation

T a b l e 3. The summary of pointed rates of visual features of architectural elements and vegetation growth in the landscape design near the Regional court in Nitra on the part of harmonic effect.

Existing area	Architectural elements	Vegetation growth	altogether
1.	13	41	54

Categories:

- The landscape design performs aesthetic-representative function: 69 – 62 p.
- The landscape design particularly performs aesthetic-representative function: 61 – 46 p.**
- The landscape design not performs aesthetic-representative function: 45 – 23 p.

whose height is more than 7.6 m. Equally inept are the other vegetation elements, which are more stand then is the height given by the divine proportion. The majority of the architectural elements do not compete with the courthouse building because they are lower than 7.6 m. The adequate dominant of vegetation is shape dominant *Sophora japonica* L. 'Pendula', which does not rise 7.6 m and is at breather distance than 32.3 m. Therefore, do not compete with the courthouse building. The reinforcement surface proportionality (17 m wide) is in harmony with the overgrowth surface width (28 m) – its ratio is 1:1.618 (Fig. 5).

### Criteria of suitability for landscape design

The criteria of elements' suitability for the landscape design in front of the Regional Court in Nitra were elaborated on the basis of the composition elements proportionality evaluation, of found analytical facilities of elements and on the basis of the representative areas creation principles. The provisions are made for specifics of the landscape design in front of significant historic buildings. Downed landscape design criteria served as the interpretation of the relationship between architectural and vegetation elements and for features suitable for the composition valuating for this concrete aesthetic-representative area.

a) Feature combinations with harmonic effect:

Architectural elements

- nature materials,

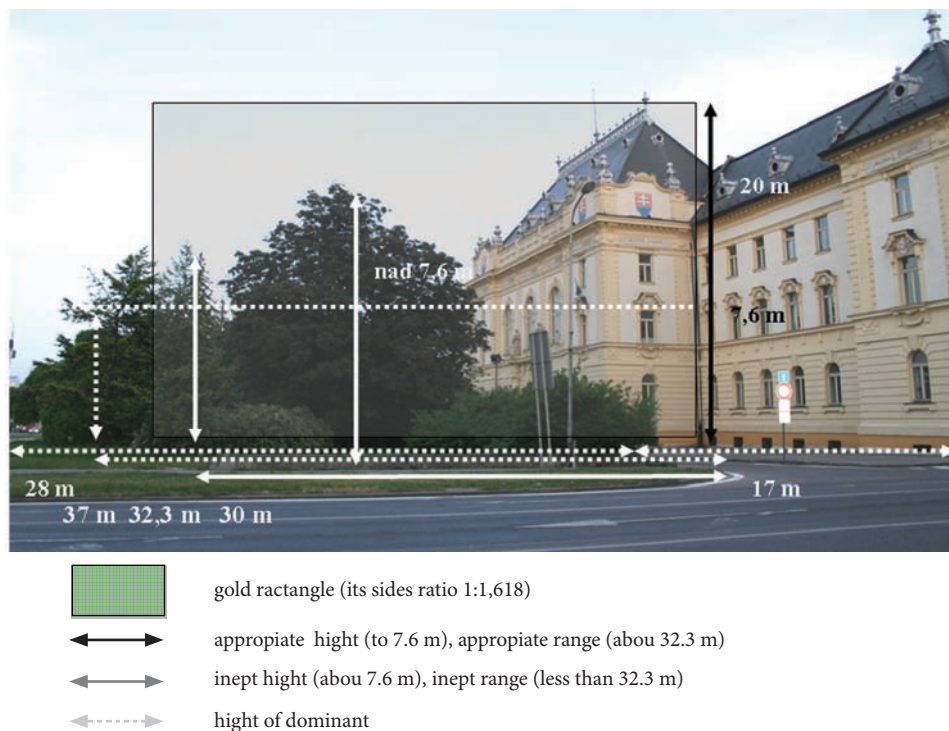


Fig. 5. The proportional evaluation of composition elements.

- harmonic richness of colours – several colour combinations are harmonic,
- the lower element and the middle tall element (the elements in the landscape design in the front of the Regional Court in Nitra should be 7.6 m high),
- geometric or organic shape – so that the architectural style should be kept,
- harmonic dominant – is expressive in one or in more of its visual facilities, is only one in the landscape design and other elements are hierarchically lower,
- harmonic balance – the elements' facilities are balanced by the others elements, so that both sides of the landscape design should have the same importance.

#### Vegetation overgrowth

- all types of texture,
- harmonic richness of colours – several colour combinations are in harmony,
- the lower and the middle tall growth (the growth in the landscape design in the front of the Regional Court in Nitra should be high to 7.6 m),
- natural shape and form of shape – without artificial interventions in the woody plant crowns and herbs shape in the undergrowth, with the maintenance of natural shape facilities, or cultivated woody plants with characteristic shape of crowns,
- pruned shape – clipped woody plant crowns,
- ground area shape – circle, square, rectangle, polygon,
- harmonic dominant – is expressive in one or in several of its visual facilities, is only in the landscape design and other elements are hierarchically lower,
- harmonic balance – the elements' facilities are balanced by the others elements, so that both sides of the landscape design should have the same importance,.
- foliage non-affects,
- species diversity non-affects,
- vegetation growth is contiguous to the spacer,
- open and overgrowth surface ratio is 1:1 to 2 and more : 1.

#### b) Feature combinations with partially harmonic effect:

##### Architectural elements

- neutral richness of colours – elements are in neutral colour,
- neutral dominant – is dominant on the basis of one inexpressive attribute,
- moderately disturbed balance – in the landscape design is situated vegetation element, which is disturbing its balance only by one, less meaningful feature.

##### Vegetation growth

- neutral richness of colours – overgrowths are in neutral colour,
- neutral dominant – is dominant on the basis of one inexpressive attribute,
- the ground area shape – oval, ellipsis,
- moderately disturbed balance – in the landscape design is situated the vegetation element, which is disturbing its balance only by one, less meaningful feature.

#### c) Feature combinations without harmonic effect:

##### Architectural elements

- material combination – elements made from artificial and natural material, artificial matters,
- disharmonious richness of colour – many coloured elements, which are disturbing the area of its colour,
- tall element,
- combined shape – geometrical with organic, which invade style uniformity,
- inharmonious dominant – in the landscape design are two and more dominants, which are in competition,
- evidently disturbed balance – in the landscape design are elements, which are invading the balance of the sides of the landscape design by visual expressive attributes.

##### Vegetation growth

- inharmonious richness of colour – many coloured landscape designs with woody plants and herbs, which are invading the area by their colour,
- tall overgrowth,
- various shape – shaped sorts of woody plants, also pruned sorts, but also natural crown shapes,
- ground area shape – line,



- inharmonious dominant – in the landscape design are two and more dominants, which are in competition,
- evidently disturbed balance – in the landscape design are elements, which are invading the balance of the sides of the landscape design by visual expressive attributes,
- strewed vegetation,
- open and overgrow surface ratio is 1:2 and more.

*Landscape design compositional-aesthetic evaluation*

The valuation rise of the given criteria, which have been elaborated for this concrete landscape design on the attribute combination basis, classes to categories (Figs 3, 4, 6, Tables 1, 2)

The architectural elements made from synthetic material are not suitable for arrangement in front of the historical building of the Regional Court. Architectural and vegetation elements are in neutral colour, thus neutral colour combinations with indefinite effects are predominating. The majority of architectural elements rise to 0.5 m. The highest and the superficially largest element is the courthouse building (20 m), which is partially superimposed by the tall overgrowth. The shape of the architectural elements is geometrical; vegetation elements have a natural shape and the shape given by cultivar. The architectural elements' domination is inharmonious – the architectural element fountain and the other competing vegetation dominant are competitors to the courthouse. The balance is harmonic – architectural and vegetation elements are deployed symmetrically. The landscape design is tree etaged, with large species richness, contiguous (the crown density in valuated overgrowth is over 80%), with the ratio of opened and over browned areas 1:2 and more.



- element performs aesthetic-representative function
- element particularly performs aesthetic-representative function
- landscape design not performs aesthetic-representative function

Fig. 6. The proposition of landscape design.

From the view of the aesthetic effect of the composition were attached points to visual attributes of architectural elements and vegetation growth near the Regional Court Building in Nitra (the architectural elements – 13 points, Table 1, vegetation growth – 41 points, Table 2). In the summary (Table 3) it was determined that the landscape design near the Regional Court Building in Nitra partially performs aesthetic-representative functions.

## Discussion and conclusion

After the consideration of the landscape design composition on the basis of determined criteria, some measures to improve the vegetation area state with the aesthetic-representative function have been suggested. The considerations are making for:

- supporting and emphasizing elements with suitable features and elements which were selected as suitable dominants,
- supplementation of the dominant.
- proportionality alternation of elements so that the elements are not concurrent,
- visual attributes alternation of the arrangement (colour, texture, shape, height, etc.).

The proposition is focused on the quality improvement of the landscape design following the aesthetic-representative function (Fig. 7). The changes were proposed on those facilities that are invading, or are not creating harmonious action in the landscape design (Figs



Fig. 7. The proposition of landscape design.

Notes: 1 – proposed trees for the building frame, 2 – the primal trees, 3 – proposed regular design, 4 – proposed simple shaped wooden benches, 5 – proposed lighting with historical effect

3, 4, 6). On this area, it was 50% attributes of architectural elements and 42% attributes of vegetation growth.

The architectural dominants are competing with the vegetation dominants and the other elements, which are higher than 7.6 m. The elements covering up the architectural attractive entrance to the building were removed. Only the proper vegetation dominants were kept (the shape dominant *Sopohora japonica* L. 'Pendula'). The building has a horizontal character; therefore the suitable frames are slim broadleaved species. The area in front of the face of the building is opened, so the ratio, of the opened and the overgrown areas, is better (2:1).

The fountain made from concrete with a blue coat of paint is inept. In front of the historical building, it is representing the inharmonious dominant. The whole round arrangement with the movables should be substituted by the new one with the geometric ground plan (that shape had the arrangement primarily, according to historic descriptions). The opened area was proposed, so that the building should stand out. To the paving stone was proposed the flowerbed with the harmonious colour combinations of plants. Its aesthetic effectiveness is all year round (always-green *Buxus sempervirens* L. is supplemented by the perennial *Lavandula angustifolia* Mill.). The elements of the small architecture are visually reduced by using the simple quadratic shape and natural matters. The approach road in front of the important building is well founded and its proportionality is suitable to the designed area. The change of asphalt surface in stone pavement was proposed.

The proposed changes in the architectural elements and the vegetation growth features will create a combination, which will support the area's harmonious effect. The realization of the proposition of the landscape design in front of the Regional Court in Nitra will perform the aesthetic-representative function.

The subjective valuation of aesthetic-representative landscape design composition can have various grades. The created methodology is an attempt to objectively value the basic combinations of the architectural and vegetation elements' features. Subjective taste is something unique for everyone. The feeling and the perception of beauty are subjective. Used methodology was elaborated to increase the objectivity of the basic principles' evaluation of the landscape design with aesthetic-representative function. The methodology is in general for vegetation areas with various functions; the otherness are only in the determination of the criteria required for the evaluation and for the proportion of the existing landscape design. A basis of landscape design is defining basic principles. This is illustrated in the concrete landscape design example in Nitra.

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