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REVIEW



BEST PRACTICES

In Educating Sustainability
and Heritage

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**Enhancing of Heritage Awareness and
Sustainability of Built Environment in
Architectural and Urban Design Higher Education**



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REVIEW: Best Practices In Educating Sustainability and Heritage

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Built Architectural & Urban Projects



Serbia (Belgrade)



Italy (Venice)



Cyprus (Nicosia)



Greece (Thessaloniki)



Spain (Seville)



SERBIA

X

Jelena Živković
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project

04

The Old Core of Zemun

Detailed regulation plan for the Old core of Zemun (OCZ DR Plan)

IDENTIFICATION

Designations

- ✗ The spatial cultural and historic ensemble of great value

Information about the location

- ✗ Historic centre
- ✗ Urban centre

Address

- ✗ The urban municipality of Zemun
City of Belgrade

Country/Region

- ✗ Serbia

Coordinates

(GIS: ETRS89/Google Maps: WGS84)

- ✗ 44°50'42.7"N
20°24'46.8"E

City size

- ✗ Urban area 99,42 km² / Zemun is an urban municipality of Belgrade, the capital of Serbia

Website

- ✗ <http://zemun.rs/>

Accessibility

- ✗ Public

Public visits

- ✗ Yes

Category

- ✗ Urban project
Urban planning

Deliberative and participatory planning

- ✗ No



Figure 1. Location of the Old Core of Zemun
source: authors of the case study, Snazzy maps



Figure 2. a) Borders of the Detailed Regulation Plan for the Old Core of Zemun (source: authors), b) Implementation of OCZ DR Plan – public projects and areas of intervention during 2004-2020.
source: Authors of the case study



Figure 3. Panoramic view of Zemun from Gardoš fortress
source: Authors of the case study

Current use

✕ The old downtown of Zemun is one of the two historical cores and an integral part of Belgrade's main center. The downtown area is divided into five zones that slightly vary in predominant use. Lower Zemun is a typical central mixed-use area (commercial activities, culture, education, health, administration, variety of housing types,...). Gardoš and Čukovac are two hills with extraordinary panoramic views, and were historically mainly housing areas. Recently, Gardoš became a popular tourist area due to the attractive Millennium tower and Zemun fortress, picturesque streets and improved connections with Lower Zemun and waterfront area. Main educational institutions and schools, recreational center, a hospital, and other public buildings are concentrated in the City Park area, while the Waterfront area is used predominantly for tourism, recreation and sport (figure 3).

Year (period) of the project renovation/restoration

✕ "The Detailed regulation plan for the Historic core of Zemun" has been adopted in 2003. The implementation of OCZ DR Plan through public sector investments from 2004 – 2020 focused on five main areas of urban renewal, where different projects were designed and delivered:

- Zemun fortress (2018-2019, project 2016) and Millennium tower (2011) reconstruction and restoration; including staircases towards Zemun fortress (2019);
- Reconstruction and re-connection of public squares in Lower Zemun eastern area (2011 – 2017). Establishment of the pedestrian zone. Project 2009;

- Reconstruction of historical streets in Gardoš and Lower Zemun eastern area (2017-2020);
- Façade restoration in main streets (2019);
- Reconstruction of the Danube riverbank (2007-2010).

KEY FEATURES



Remarkable attributes/ Singularities/Specific Values

Built in the 18th century, the old downtown of Zemun has an orthogonal street network, an interior zone division, and the main street that divides the town into east and west parts. The preserved architecture documents variety of building techniques and a diversity of architectural forms, styles, and cultural influences. The symbol of Zemun is the Millennium Tower on Gardoš Hill.

Scope of application/necessity of the project:

The last decade of the 20th century witnessed a general decay of the Old Core of Zemun. Unplanned structures of inappropriate architectural and building quality occurred within the area of exceptional architectural, cultural and historical value, threatening to obliterate its heritage value. Besides that, degradation of public spaces and their inappropriate use, as well as the neglect and devastation of protected buildings and structures, additionally lowered its heritage quality. Another problem was a fragmented treatment of the segments that form the Old core, in previous urban plans. Therefore, the purpose of the OCZ DR Plan was to form the basis for the integrated and sustainable development, use and conservation of The Old Core area.

Area of the building (m²)

- ✗ The surface area of the Old core of Zemun is 80 ha. It occupies the area between the Đure Đakovića, Nikolaja Ostrovs kog, Vrtlarska, Senski trg, Ugrinovačka streets, and encompasses Ćukovac and Gardoš hills on the north, descending towards Danube river as a natural border (figure 2).

Current owner

- ✗ Public and private: the city of Belgrade, Municipality of Zemun, private owners

Architects

- ✗ "The Detailed regulation plan for the Old core of Zemun" (OCZ DR Plan) has been developed by The Urban Planning Institute of Belgrade in cooperation with Belgrade City Institute for the Protection of Cultural Monuments. The plan Coordinator and the responsible urban planner was Milica Grozdanić, dipl. inž. arh, working together with Bojana Stefanović, arh. teh.

Other designers/engineers

- ✗ Available information on designers of OCZ DR Plan public sector projects:
 - Zemun fortress reconstruction and restoration - Belgrade City Institute for the Protection of Cultural Monuments: Authors: Ivana Konta, dipl. inž. arh and Rade Mrlješ dipl. inž. arh;
 - Reconstruction and pedestrian connection of public squares in Lower Zemun eastern area - The Institute of Transportation CIP;
 - Reconstruction of the Danube riverbank - PIM Ivan Milutinovic Beograd;

Other agents

- ✗ Private donations for the reconstruction of Millennium Tower Plateau

Developer

- ✗ N/A

Building contractor

- ✗ The OCZ DR plan was financed by the City of Belgrade. Different building contractors/investors were engaged for different projects:
 - For Zemun fortress reconstruction and restoration: City of Belgrade, City of Belgrade, Ministry of Justice, Ministry of trade, tourism and telecommunications;
 - For reconstruction and re-connection of public squares in Lower Zemun eastern area - City of Belgrade
 - For reconstruction of historical streets in Gardoš and Lower Zemun eastern area, Reconstruction of staircases towards Zemun fortress, and Façade restoration in main streets
 - Municipality of Zemun
 - For reconstruction of the Danube riverbank - National investment plan of the Republic of Serbia

Cost of the project/execution time

- ✗ No information is available on the cost of the OCZ DR plan. Available information on cost of some OCZ DR Plan public sector projects:
 - Zemun fortress reconstruction and restoration (2018-2019) - 34.000.000 din (288.135 Eur)
 - Staircases towards Zemun fortress reconstruction – 15.000.000 din (127.118 Eur)
 - Reconstruction of public squares in Lower Zemun eastern area (2011 – 2017)- Available information for 3rd phase (Gospodska and Lagumska street and Magistrat square) - 155 000.000.din (1.313.560 Eur).

Previous studies (Ex. Archaeological, historical, structural, materials, etc.)

- ✗ - Belgrade City Institute for the Protection of Cultural Monuments (2002) "Conditions for storage,

maintenance and use and measures of technical protection of the spatial cultural-historical whole of the Old Town of Zemun for the regulatory plan of the Old Town of Zemun”

- Škalamera Ž, (1966) Staro jezgro Zemuna, knjiga I, Istorijski razvoj, Zavod za zaštitu spomenika kulture grada Beograda, Beograd,
- Škalamera Ž (1967) Staro jezgro Zemuna, knjiga II, Arhitektonsko nasleđe, Zavod za zaštitu spomenika kulture grada Beograda, Beograd

of Cultural Monuments. <https://beogradskonasledje.rs/kd/zavod/zemun/staro-jezgro-zemuna.html>)

CONSTRUCTION PERIOD

OCZ DR Plan Implementation started in 2004 and is still going on.

SUMMARY OF MAJOR FUNCTIONAL AND STRUCTURAL CHANGES / YEAR OF INTERVENTION

OCZ DR Plan formed the basis for integrated and sustainable development of the area and supported qualitative instead of quantitative transformations (2004 -2020). It aimed to affirm the historical and high-quality urban ambience of the Old Core of Zemun as both a good place for living and for tourism. Based on traditional use, culture and heritage values, actions towards

HISTORY OF THE BUILDING/SITE

Original use

- Civil
- Residential
- Religious
- Military
- Commercial
- Leisure

HISTORIC USES

“The existing agglomeration grew on the ruins of a Turkish village that preserved the continuity of human settlements at the same place since the Roman Taurunum. In the eighteenth century the old downtown of Zemun was transformed into a town.....The architecture of old downtown Zemun keeps the continuity of urban institutions, economic circumstances, and social tendencies; the development of military, sanitary, educational, religious and traffic institutions and the various types of commercial and artisan shops, the development of residential culture. Old terraces and street names, groups of houses, ambiances and atmosphere are the constitutive elements of spatial relations and the living framework created from the early eighteenth century to the present day” (figure 7).
(Belgrade City Institute for the Protection



Figure 4. Zemun fortress with the staircase before the reconstruction

Source a) Miljan Simonović – own work, CC BY-SA 4.0, https://commons.wikimedia.org/wiki/File:Gardoš_kula_Zemun_09.jpg, b) Nicolo – own work, CC-BY-3.0-RS, [https://commons.wikimedia.org/wiki/File:Gardoš_\(26\).JPG](https://commons.wikimedia.org/wiki/File:Gardoš_(26).JPG)



Figure 5. Urban Squares before the reconstruction

Author: a) Nicolo – own work, CC BY-SA 3.0 [https://commons.wikimedia.org/wiki/File:Magistratski_trg_\(1\).JPG](https://commons.wikimedia.org/wiki/File:Magistratski_trg_(1).JPG), b) Author: Nicolo – own work, CC BY-SA 3.0 [https://commons.wikimedia.org/wiki/File:Magistratski_trg_\(18\).JPG](https://commons.wikimedia.org/wiki/File:Magistratski_trg_(18).JPG)



Figure 6. Urban streets and facades before the reconstruction

Source a) Author: Matija – own work, CC BY-SA 3.0 https://commons.wikimedia.org/wiki/File:Franjo_Jenc_8.jpg b) Author: Pinki at Serbian Wikipedia, public domain https://commons.wikimedia.org/wiki/File:Glavna_zemun.JPG, c) Author: Miomir Magdevski – own work, CC BY-SA 4. https://commons.wikimedia.org/wiki/File:Krovovi_Srbije_31.jpg, d) Author: Julian Nyča – own work, CC BY-SA 3.0 https://commons.wikimedia.org/wiki/File:Zemun_Sindelićeva_Street.JPG

implementation of the plan were different for different areas. In the Lower Zemun area, the main goal was to re-establish traditional uses and connections between main urban squares. For that purpose, the open-air market area was reduced to provide a place for public gathering and diversity of uses on Big Square (Veliki trg/Omladinski trg). At the same time, the street network was reorganized and reconstructed in order to support the pedestrianization of the area. With Zemun Fortress, staircases and streets reconstruction, mainly the housing area of Gardoš became better connected with the Waterfront zone. Therefore, tourism-oriented activities, which were due to the widening of the riverbank intensified in the waterfront area, started to occur in many houses and courtyards on the Gardoš hill.

ARCHITECTS / AGENTS

OCZ DR Plan Coordinator and the responsible urban planner was Milica Grozdanić, dipl. ing. Arh, working together with Bojana Stefanović, arh. tech. Different architects designed different segments of plan implementation.

PHYSICAL CONDITION BEFORE RESTORATION / RENOVATION

There were many problems related to the physical condition of buildings and public spaces: a) Illegal, unplanned buildings and structures were built; b) Public squares were disconnected, neglected, degraded by illegal structures, and over-used for parking and market, c) Protected buildings and structures were neglected and devastated, d) Street pavements and building facades were in bad condition; e) Parts of the riverbank were threatened to flooding.

STATUS OF PROTECTION

Due to the intensive documentation and valorization activities of the Belgrade City Institute for the Protection of Cultural Monuments during 1967 to 1970, that were based on the Decision "Spatial cultural and historic ensemble, Old core of Zemun" (Prostorna kulturno istorijska celina, Staro jezgro Zemun, (Rešenje Zavoda br. 949/2 od 1.11.1966), the Old Core of Zemun has been designated as "Spatial cultural and historic ensemble of great value" in 1979. (Kulturno dobro od velikog značaja, (Odluka, „Sl. glasnik SRS“ br. 14/79). Before that, the ruins of the Zemun fortress are the oldest surviving structural remains in the historic core of Zemun. The fortress was designated as a cultural monument in 1948 (Decision no-963/48 of the Institute for the Protection and Scientific Study of Cultural Monuments of the People's Republic of Serbia of 17/6/1948).

Based on valorization, within the boundaries of the protected spatial cultural-historical Old Core of Zemun area, there is a large number of buildings that have the status of individual cultural monuments, many sub-units of special urban-architectural and ambient values, large number of archaeological sites (Taurunum), as well as natural assets that enjoy prior protection.

More information about cultural monuments, urban space valorization, valorization of buildings, and technical protection measures for the old core of Zemun available at: https://beogradskonasledje.rs/wp-content/uploads/2013/nasledje4/10_aleksandra_dabizic.pdf

GENERAL DESCRIPTION OF THE BUILDING BEFORE ITS RENOVATION / RESTORATION

The Old Core of Zemun has a shape of an irregular square with an orthogonal urban matrix in the Lower Zemun and City Park area, and an organic street network on Gardoš and Ćukovac hills. Architectural typology reflects diversity of architectural forms, styles, cultural influences. Four main building types exist: modified Pannonian (rural), small-town, high-ground floor and single-storey mixed-use types. Large public buildings (schools, faculty, sports centre, churches) are located in the City Park area. The main street divides the area into the east and west part, while main commercial streets connect the western part with eastern Zemun's system of urban squares and with a green promenade on the Danube riverbank. The city's landmark is Millenium tower on Gardoš hill.

PROJECT DESCRIPTION



DESIGN PROJECT IDEA FOR THE RENOVATION / RESTORATION

"The Plan defines the concept and scope of regulating and upgrading the Old Core of Zemun, with the purpose of preserving its tradition, identity, cultural, historical and natural setting, and upgrading public spaces and functions. The interdisciplinary approach to the Core, seen as a multilayered urban organism, is conceived of as a conservation and planning strategy of revitalization and reconstruction on a limited scale, aimed at resolving contradictions between heritage and real-life needs" (Grozđanić, 2010).

OCZ DR Plan recommends the protection of the existing urban fabric, the preservation and improvement of public spaces, the preservation of the plot patterns, horizontal and vertical regulation, and traditional architecture. It promotes the revitalization of the existing and introduction of new uses

for buildings and spaces of exceptional cultural, historical, architectural, and townscape value, as well as the preservation of vistas, skyline and townscape. The Plan suggests re-integration of the system of urban squares as well as the development of new pedestrian and pedestrian-friendly streets that link Zemun core with Gardoš hill and Danube river. It also sets guidelines for architectural design and construction in the future, in accordance with the "Study and valorization of buildings and urban spaces", and defines spaces with the different regime (degree) and conditions of protection. More information about Detailed regulation plan - division into urban blocks and land-use plan, is available at: <http://mapa.urbel.com/Silverlight/1083/1083-tekst.pdf>; <http://mapa.urbel.com/Silverlight/1083/> More information about the Detailed regulation plan – proposed physical structure improvements is available at: <https://scindeks-clanci.ceon.rs/data/pdf/1450-605X/2010/1450-605X1011149G.pdf>

DESCRIPTION OF THE CHANGES AND ADDITIONS

OCZ DR Plan aimed to enable the sustainable development of the area through revitalization and urban renewal of urban spaces and



Figure 7. Zemun fortress and staircase after reconstruction

source: authors of the case study

buildings. Through implementation projects, that were mainly focused on main streets, Gardoš, waterfront and eastern part of Lower Zemun areas, protected buildings and urban spaces were restored and reconstructed, thus fulfilling the Plan's goal of enabling simultaneously protection and presentation of cultural and natural urban heritage, tourism development, and higher quality of life. The urban renewal projects, as presented in this document's gallery (figures 4-6, 8-10) encompassed:

- a) Zemun fortress and Millennium tower reconstruction and restoration, including reconstruction of staircases towards Zemun fortress;
- b) Reconstruction and re-connection of public squares in Lower Zemun eastern area and the establishment of pedestrian zone included re-design of Big square for multifunctional use (festivals, gathering, temporary markets), greening, re-design and equipment of Masarikov and Magistratski square and their integration with Gospodska street.
- c) Reconstruction of historical streets in Gardoš and Lower Zemun eastern area, included new traffic organization, greening, new pavement based on the use of traditional methods and materials; new street furniture and façade restoration in main streets and squares.

Besides that, in the waterfront area a new Danube riverbank was formed for flood protection purposes, and more intensive social and commercial use.

More information about Conceptual Project for the pedestrian zone in Zemun available at: <http://beobuild.rs/rekonstrukcija-pešacke-zone-u-zemunu-p2658.html>

BUILDING MATERIALS

OCZ DR Plan recommends the use of materials for different interventions. Revitalization and renovation of the existing building stock require the use of traditional materials such as brick, plastered or drawn, artificial stone, and wood and iron for construction. Roofs should be covered with flat tiles, and mansard roofs with copper, painted sheets or other modern materials. The wall canvas should dominate in relation to the glazed surfaces and the use of pastel tones (yellow, gray, pink...) is suggested.



Figure 8. Urban Squares after reconstruction
source: authors of the case study



Figure 9. Urban Streets and facades after reconstruction
source: authors of the case study



Figure 10. Details of streets and facades after reconstruction
source: authors of the case study

For paving floor surfaces (sidewalks, squares), use granite cubes, clinker tiles, bricks, stone, wood and other natural materials. When building new facilities, the use of new techniques and materials is free, while respecting the context (figure 10).

PROJECT IN RELATION TO THE SUSTAINABILITY

Social aspect:

The Plan set out that the existing social setting is to be retained under upgraded ecological and adapted functional conditions. Through implementation projects, the whole area became better integrated, pedestrian-friendly, and presented as a valuable urban heritage: pedestrian zone has been formed; public squares were interlinked; the Big square converted from market to social gathering and festivity place; widening of the riverbank enabled more social activity; protected buildings were restored and reconstructed; street pavements and facades have been upgraded.

Economic aspect:

Renewal and reconstruction were conceived in OCZ DR as a process unfolding in a way and at a pace permitted by the financial, cultural and, above all, organizational capacities of the community.

Environmental aspect:

Public spaces were re-connected between themselves, and with the Danube river; better ventilated by removal of unplanned structures, and upgraded by the greening of streets. Flooding problems were solved with new riverbank formation.

SPECIAL METHODS OR TECHNIQUES USED IN THE PROJECT WHICH REFLECT THE SUSTAINABLE DESIGN

OCZ DR Plan's methodological approach to sustainable urban development is based on the concept of urban renewal, conceived as "an adaptation of spaces and structures to the changed social, cultural and economic setting, without substantially altering their physical properties, with the purpose of preserving the tradition, identity and visual integrity of the historic whole".

A sustainable approach to design is also reflected in OCZ DR Plan implementation projects since for paving street floor surfaces (sidewalks, squares, staircase) traditional materials were used (granite cubes, clinker

tiles, bricks) and traditional techniques were implemented in their delivery.

DIGITAL DATA EMPLOYED FOR THE DOCUMENTATION (3D SCANNING, PHOTOGRAMMETRY, ETC.)

× N/A

TOOLS/TECHNOLOGIES USED FOR THE IMPLEMENTATION OF THE NEW USE

"The OCZ DR PLAN methodology proposed a public competition for the improvement of public spaces and facilities in Zemun as a tool and basis for developing the Plan. This tool aimed to check the offered solutions in the phase of preparing the spatial-program concept of the Plan, and to collect new ideas on possible ways of arranging space." Information: OCZ DR PLAN (arch. number 350-3457/96/03)

DISSEMINATION / PROMOTION ACTIVITIES (WORKSHOPS, CONGRESS, PUBLICATIONS, PRIZES)

Awards:

2003. I award in the Category of Regulation Plans on the XII International urban planners exhibition in Niš

Nominations:

2003. The Plan was nominated for the City of Belgrade Award for 2003 in the field of architecture and urbanism

Publications:

2010. Grozdanić, M. Prikaz metodologije planiranja u zaštićenim kulturno-istorijskim područjima na primeru starog jezgra Zemuna. Nasleđe, (11), 149-181.

Exhibition:

2003. Exhibition of the public anonymous survey-program competition for the concept of arranging public spaces and buildings of the Old Town of Zemun, accompanied by the Catalog from the exhibition of competition works.

Workshops:

The survey "To build and work according to you" of the Municipality of Zemun, based on which the citizens chose the arrangement of streets in the Old core of Zemun as a priority action.

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ACADEMIC WORKS / STUDENTS RELATED PROJECTS / PUBLICATIONS

Milica Grozdanić – Kontekstualni uslovi i uticaji na Staro jezgro Zemuna sa posebnim osvrtom na nasleđenu i buduću izgradnju. Magistarski rad, Arhitektonski fakultet Univerziteta u Beogradu. (unpublished MSc thesis, UBFA)

Elective course "Urban recreation" (2009/10) topic Belgrades' waterfronts

OTHER SIMILAR PROJECTS AS A REFERENCE

The Revitalization of Vilnius Old Town, 1995 – 2005, Lithuania
Potsdam downtown revitalization project, Germany

REFERENCE TO WORLDWIDE EXAMPLES

The first similarity of all three examples is reflected at the level of the existing physical structure. They are spatial historic wholes of great significance that combine various natural and human-made structures of different dates and values and are.

In this regard, another similarity is in the approach to their modernization through the process of urban renewal as a methodological approach for space enhancement and the promotion of an exquisite ambience.

In all three cases, it was understood and implemented as the adaptation of spaces and structures to the changed social, cultural, and economic setting without substantially altering their physical properties, all in order to preserve the tradition, identity, and visual integrity.



HERSUS