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International committee for
documentation and conservation
of buildings, sites and neighbourhoods of the
modern movement

GOOD CONSERVATION AND RESTAURATION PRACTICE FICHE

Composed by working party of: Docomomo Serbia

0. Name of building & picture of before and after

Before conservation/ restauration	After reconstruction
 **1965**  **1999**	 **2017**

Depicted item: VHF-PTT and RTV Tower on Avala mountain

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Sources: Arhitektura urbanizam 40, p.19-23; screenshot from 'Mreža predajnika u Srbiji: datumi bombardovanja', RTS Trezor, https://www.youtube.com/watch?v=05B9w8egazg&t=47s; personal archive of Jelica Jovanović, October 2017.

Dates: 1959 – competition, results published in February 1960; 1961 - 1965 - construction; 25-29th of April 1999 airstrikes and demolition; 2005 - 2010 - reconstruction.

- **Other images or documents**

Copies of the project documentation from Historical archive of Belgrade
https://www.dropbox.com/sh/34jwtw97x0ny0pg/AAB4K7VX4XB0xooMw3b07AGFa?dl=0

- **Data for identification**

current name: Avala Tower

former/original/variant name: VHF-PTT and RTV Tower on Avala mountain

address/ number(s) and name(s) of street(s): Avalski put bb, 11000 Belgrade, Serbia

town: Belgrade, Grocka municipality

province/ state: -

post code: 11000

country: Serbia

geographic GPS coordinates: 44°41'45.3"N 20°30'52.0"E

current typology: TRC - telecommunications, RTV

former/original/variant typology: TRC - telecommunications, RTV

comments on typology: -

- **Status of protection**

protected by: not protected.

grade: not graded

date: -

valid for: -

remarks: -

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- **Accessibility**

opening hours: from **9 am** to **8 pm** in the period from **1 April** to **31 October**
from **9 am** to **4 pm** in the period from **1 November** to **31 March**

viewing arrangements: guided tours upon request; online reservations available via link
http://avalskitoranj.rs/kontakt/?lang=en

1. History of building(s)

- **Chronology**

Commission/ competition date: 1959

design period (s): 1959-1961

start of site work: 1961-1965

completion/inauguration: 1965

- **Summary of important changes after completion**

type of change: restoration, renovation, modernization of facade; demolition; reconstruction anew by rebuilding a replica.

date(s): 1986; 1999; 2005-2010.

circumstances/reasons for change: ageing of the installations, disrepair of the aluminum facade elements due to age; bombing in 1999; reconstruction of a replica (in external appearance) as a landmark of Belgrade with seismic, static and functional improvement and modernization of the interior to support the new technology for radio, TV and mobile phone signal emission/receipt.

effect of changes: The urban and architectural landmark of Belgrade has been restored - tower was one of the most visible structures of Belgrade skyline and a symbol of the city, pride of its citizens who donated for its reconstruction as a collective effort. The national TV and radio operators regained their infrastructure and a new modernized platform that served for digitization of the signal in Serbia.

persons/organizations involved:
Original project: arch. Uglješa Bogunović, arch. Slobodan Janjić, structural engineer Milan Krstić, collaborators arch. Radmila Simić, arch. Milena Janjić; construction company Rad; investor General directorate of the post office and RTV Belgrade.
Reconstruction: initiators Association of Journalists of Serbia and national broadcasting company of RTV Serbia supported by Government of Serbia; project Institute of Transportation CIP and cooperator DEL ING d.o.o., Beograd; construction company Ratko Mitrović Dedinje; supervision and audit Institute of Transportation CIP and Faculty of Architecture University of Belgrade.

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2. Summary of restauration

- **Summary of important changes after restoration**

type of change: reconstruction and modernization

date(s): 2005-2009 reconstruction; April 2010 opening

circumstances/reasons for change: the building was demolished in the bombing in 1999; in 2005 the appeal for its reconstruction was launched, both as a part of the wide effort of restoring the tower as a landmark and the part of the skyline of Belgrade, and as a part of effort to renew and modernize the telecommunications infrastructure of the national broadcasting company, which lost Avala tower in 1999 airstrikes, as the 14th of 25 buildings demolished by bombing within its telecommunications' infrastructural system.

effect of changes: the building was reconstructed to have identical appearance as the old tower, with the difference in height of the steel antenna on top reaching 204m of height instead of 202m as original tower.

persons/organisations involved: initiators Association of Journalists of Serbia and national broadcasting company of RTV Serbia supported by Government of Serbia; project Institute of Transportation CIP and cooperator DEL ING d.o.o., Beograd; construction company Ratko Mitrović Dedinje; supervision and audit Institute of Transportation CIP and Faculty of Architecture University of Belgrade.

- **Current use**

of whole building/site: Public company Emission Links and Techniques
of principal components (if applicable): RTV Serbia, Tourist organization of Serbia, mobile operators.
comments: -

3. Evaluation of restoration/conservation

Give the scientific reasons for selection for Docomomo documentation.

Intrinsic value

- **Technical evaluation:**

The investor's request was to completely retain the previous visual identity of the Tower, which meant retaining all the dimensions of the previous object. However, the structural design was fully modernized and upgraded, according to the new laws, rules and regulations for structures like this. The tower's building consists of a concrete part 136.65 meters of height, and a steel part of 67.85 meters of height. The concrete part consisted of the tower's 'feet', the tower's 'tree' and the seven-floor gondola on top. The tower is now seismically more stable, designed to withstand magnitude of up to 9,3 degrees by Mercalli, the harshest earthquake that can occur in this area. Bearing in

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mind the fact that the previous tower was designed in 1960s, well before the adoption of the Law on Design in Seismic Areas, it was decided to improve the performance of the new building.
In addition to the hall and terrace specially designed for antennas, RTV and PTT devices, the Avala tower has a cafe bar at 119.20m and a viewing terrace on 122.60m of height, to which the visitors ride two elevators within a minute (about 40 seconds). In case of fire, the evacuation time from the object is about nine minutes, and the entrance control provides an insight into the exact number of visitors in the tower. A completely new static design was made, the depth of the foundation was increased, the concrete strength gradient increased up to MB 60 in certain parts of the structure, where the highest stresses were introduced for pre-stressing cables. Special attention is paid to the aspect of fire protection. The materials used in the tower's interior have also suffered significant changes. It is envisaged to incorporate non-combustible materials, or materials in which combustion does not release toxic substances: the project of the supra-pressure of the elevator shaft was completed; the 'tree' of the tower is divided into four fire brigade sectors; a water mist system is foreseen in order to extinguish any fire in the restaurant. During the construction of the tower, a special system for monitoring of the construction was made. The results obtained by these measurements will be used for both scientific and research purposes, as well as for assessing the suitability of use of the facility in extreme weather conditions. Tower has additional facility below the access plateau, using the denivelation of the terrain on which the plateau/postament of the triangle-shaped base of the tower is located, which was formed as a new useful space, net surface of around 930m^2, intended for accommodation of accompanying contents intended for visitors (trade, catering, tourism). Landscaping of the complex, its functional parts and individual buildings, includes: free areas, architectural and construction elements and urban equipment as well as technical infrastructure solutions harmonized with built structures and natural environment.

- **Social evaluation:**

The reconstruction of Avala tower was a rare joint, collective effort to reconstruct a landmark of Belgrade and Serbia, especially one that belongs to post-war modernism. As a part of the effort, a music video was taped, that played on the channels of the national broadcasting company, and although state and city institutions allocated the resources, a significant amount came through donations of individuals and various companies: every theater in Belgrade played shows for the reconstruction of Tower, numerous athletes donated to the cause, various artists - writers, painters, sculptors, etc. and many others. Miloš Bato Milatović, Association of Journalists of Serbia (UNS), Radio-Television of Serbia (RTS), Ratko Mitrović construction company and Institute of Transportation CIP received the annual award of the City of Belgrade for excellence, long-lasting work and permanent contribution to the development of the city of Belgrade in 2010.
Full list of contributors is available on the web page of the Association of Journalists of Serbia http://uns.org.rs/sta-radimo/akcije/5470/izgradimo-toranj-na-avali.html.
Over 100000 visitors per year have visited the tower since its reopening, reaching record 27000 visitors in the month of April 2018.

- **Cultural and aesthetic evaluation:**

The Tower has been considered a masterpiece of Yugoslav, Serbian and Belgrade architecture and construction school, designed by bold and always innovative designers Janjić and Bogunović and constructor Krstić, who was responsible for many innovative solutions in field of concrete shell design and foundation in aggressive and challenging environment. The Tower, besides being considered the city's landmark, was also considered to be pride and joy of Belgrade's construction

sector. After 1999 bombing, many of the demolished buildings were rebuilt per new projects, rarely restoring their previous appearance. In the sector of telecommunications many new technologies were introduced and essentially, the treat was that similar situation might happen in case of Avala Tower, since it could have been easily replaced with a cluster of smaller structures placed on several locations. Another aspect to this problem was the fact that Tower, although considered an architectural masterpiece and unique given the *tripod* geometry of its base and triangular layout of the 'tree', was not under protection as a monument of culture or a cultural landmark, which would have granted the legal grounds for building its replica. Given the strong anti-modernism sentiment of the era, it was a great cultural achievement that the investor and the initiators had the vision and the strength to push the project forward, and bring this landmark back to the city of Belgrade exactly as the citizens remember it.

4. Documentation

- **Archives/written records/correspondence etc: (state location/ address)**

Historical archive of Belgrade, Palmira Toljatija 1, 11070 Novi Beograd, Serbia
https://www.dropbox.com/sh/34jwtw97x0ny0pg/AAB4K7VX4XB0xooMw3b07AGFa?dl=0

- **Principal publications (in chronological order):**

1) Competition work, Arhitektura urbanizam no. 4, Belgrade, 1960, pg. 41.
2) Built condition, Arhitektura urbanizam no. 40, Belgrade, 1966, pg. 19-23.

- **Visual material (state location/ address)**

original visual records/drawings/photographs/others:

1. Historical archive of Belgrade, Palmira Toljatija 1, 11070 Novi Beograd, Serbia
2. Urban Planning Institute of Belgrade, Palmotićeva 30, 11000 Beograd, Serbia
3. Arhitektura urbanizam journal (does not exist anymore)
4. Jelica Jovanović personal archive
5. DEL ING d.o.o., Omladinskih brigada 43, 11070 Beograd, Serbia

https://www.dropbox.com/sh/yyk9y98ookamyc8/AABbL_NVPXNC2WzIZONkk07xa?dl=0

Post restoration photographs and survey drawings: upon request from JP Emisiona tehnika i veze and Institute of Transportation CIP

film/video/other sources:
RTS Trezor, *Mreža predajnika u Srbiji: Nova Avala*
https://www.youtube.com/watch?v=ibvZcKsxWOo
JP Emisiona tehnika i veze i Avalski toranj, *Avalski toranj- promo, Vidikovac*
https://www.youtube.com/watch?v=VHzqF-vFlkg
JP Emisiona tehnika i veze i Avalski toranj, *Avalski toranj sa visine*
https://www.youtube.com/watch?v=DFMn6goWBVY
Radio Beograd 202, *Avalski toranj, uživo* http://www.rts.rs/page/radio/sr/story/25/beograd-202/3109851/avalski-toranj-uzivo.html

- **List documents included in supplementary dossier**

A) historical photography of Tower under construction

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B) plans:
3) Competition work, Arhitektura urbanizam no. 4, Belgrade, 1960, pg. 41.
4) Built condition, Arhitektura urbanizam no. 40, Belgrade, 1966, pg. 19-23.
5) Design project, Technical documentation Historical archive of Belgrade

Fiche report

rapporteur: Jelica Jovanović
date of report: 29.06.2018.

Examination by DOCOMOMO national/regional section
approval by working party co-ordinator/registers correspondent (name): Dobrivoje Lale Erić
sign and date: 29.06.2018.

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examination by DOCOMOMO ISC/R

type of ISC Registers/Urbanism/Landscape/Gardens:
name of ISC member in charge of the evaluation:
comment(s):
ISC approval:
Sign and date:

Working party/ID nº: date:
NAi ref nº.:

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