Plaka Bridge in Greece: Methodology and results of the geometric documentation of the main arch outline tracing.

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Plaka bridge is a one-arch stone-made bridge situated in the Epirus region, Greece, in the borders between Arta and Ioannina prefectures. It is not known when the first bridge was first constructed but it is known that it was rebuilt due to a collapse in 1860. In 1863 after a newer collapse, it was rebuilt in a new location (~100m south), collapsed once more and was reconstructed again in 1866.

In 22/08/1972 Plaka bridge was declared a historical monument by the Greek State. It was considered as the widest singe arched bridge of the Balkans, with a diameter of the main arch of 40 meters and an average height of 18 - 20 meters. During the heavy rainfall and floods of February 2015, the bridge collapsed once more.

The National Technical University of Athens immediately supported the restoration preliminary studies by forming an interdisciplinary team of scientists that were involved in the project.

Aim of this paper is to present part of the work of the team of the School of Architecture NTUA, which was focused on the geometric documentation of the main arch. The methodology that produced the original outline tracing of the main arch of Plaka Bridge will be presented here, which will be used as base data for the monument restoration.

The particularity of this endeavour was to examine and combine data from previous studies and surveys and try to discover the original form of the main arch by eliminating pathology deformations that had happened over the years. Another aspect of the research, was to accurately geometrically define the unique double curvature of the main arch and try to understand the role of this morphological and constructional distinctiveness. As found, this particularity coincides with several architectural and structural characteristics of the bridge and seemed to have played an important role to the function of the monument.