

# PEDESTRIAN/BIKE BRIDGE OVER MANZANARES RIVER IN MADRID

Authors: Javier OLIVA QUECEDO<sup>1</sup>, Arturo RUIZ DE VILLA<sup>2</sup>

Affiliation: <sup>1</sup> Project Engineer, AR2V Ingeniería, Madrid, Spain – [javier.olivaquecedo@ar2v.com](mailto:javier.olivaquecedo@ar2v.com)

Adjunct Professor, Saint Louis University – [javier.oliva@slu.edu](mailto:javier.oliva@slu.edu)

<sup>2</sup> Managing Director, AR2V Ingeniería, Madrid, Spain – [arturo.ruizdevilla@ar2v.com](mailto:arturo.ruizdevilla@ar2v.com)

## Summary

The city of Madrid is making efforts to make the most of the river Manzanares, improving the quality of life of the citizens and increasing the biodiversity. Madrid Rio is the most central and visible side of this work. But there is also a will to extend this enhancement beyond the city center, taking advantage to the fullest extent of the opportunities that a river brings to enhance the urban sustainability of such a big metropolis. The Manzanares Linear Park extends this intervention south along the river. The bridge presented in this work belongs to that linear system; its objective is not just crossing the waterway, since it is a sparsely populated area with other bridges nearby, but rather bringing the trail and the users closer to the river. Limited time was available for design, fabrication and installation of the bridge. This fact had a deep effect on the solution.



*Fig. 1. Bridge over the Manzanares river in the Linear Park, Madrid*

The resulting design enables a fast fabrication, a relatively easy delivery and a quick installation in the final location. The bridge consists of three different pieces of similar weight that are manufactured in the workshop and separately brought to the final location where they are quickly assembled by means of pinned connections and without any additional welding on site. Then the whole bridge is craned to its final position. Those three segments are one 18-m-long central truss and two 12-m-long solid-web lateral sections with variable height. The different structural solutions for each segment, truss for regions of high bending moments and solid web for regions with high shear force, reduce the amount of material and make shipping easier.

The lateral webs are decorated with vegetal motifs that enhance the message that the trail is not interrupted to cross the river but rather it continues over the Manzanares. This suburban area used to be a landfill, this fact produced an unexpected design issue related to the buckling of the micropiles below the abutments.

**Keywords:** steel; footbridge; bike bridge; river experience; linear park; Madrid; quick construction; zero on-site welding.