

# M-Rio: Shell Footbridges over the River Manzanares

These are twin footbridges which are to be found located in the urban area of the River Manzanares, between the Praga Bridge and the so-called Southern road Network. More specifically, the abutment on the West Bank pertaining to the Footbridge Km202+121.6 is to be found located between the streets San Graciano and Eugenio Caxes whilst the Footbridge Km202+402.0 is located between the streets Eugenio Caxes and San Zacarías.

The span between supports is 43.5m whilst the total length is 49.10m.

The Project consists of a reinforced concrete arch with a lower steel deck, offering a maximum rise of 7.70m. The deck is suspended from two rows of 8.1mm diameter hangers spaced every 0.60m on each side of the deck.

The transversal cross-section of the arch forms a vault with varying dimensions. The thickness varies from the central span to the supports as well as transversally from the longitudinal centre to the edge of the shell. The minimum thickness is 0.15m at the centre of the span and the longitudinal axis and the maximum thickness is 0.57m is at the arch supports at the joint with the deck.

The deck is composed of two 0.25m deep longitudinal beams and transversal beams which are placed every 2.40m, upon which a 0.10m thick reinforced concrete slab is cast. The width of the deck varies according to the arch projection, hence the minimum is 4.50m in the span centre and the maximum is 8.40m at the abutments.

The foundation solution differs for the abutments, be they on the right bank (West) or on the left bank (East).

In the case of the abutments on the West bank, the structures are supported upon foundation beams which spread the load over the existing tunnel walls of the underground area of the M-30 ring road. The rest of the abutment is composed of a closed reinforced concrete box which is filled with expanded clay pellets so as not to exceed the admissible load permitted upon the tunnel roof slab.

In the case of the abutments on East bank and taking advantage of the fact that there is more space between the Banks of the River Manzanares and the tunnel walls, a deep foundation solution was opted for, employing 6 micropiles.



## Spain /2010 Project data

Structural Type:  
Reinforced concrete shell arch Pedestrian  
footbridge with composite lower deck

Location:  
Madrid. Over the River Manzanares

Proprietor:  
Madrid Town Hall

Opening Date:  
End of 2010

Constructor:  
Acciona Infraestructuras

Scope of Works:  
Construction Project and Technical  
Assistance to the Works Management

Photomontage:  
MRIO Arquitectos Asociados and West8  
urban design & landscape architecture b.v.