

# FOUR FOOTBRIDGES ON THE EIBAR-MALTZAGA CYCLE PATH

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## Summary

The cycle path from Eibar to Maltzaga runs through a very complex area as the N634 road and a railway line run parallel to the river Ego and at the same level as the cycle path. Also at a considerable height is the AP-8 motorway, which was also built over the river. The new cycle and pedestrian path has to cross the river Ego three times under the motorway. Two of the footbridges are structures of moderate span (16.50 and 30.35 m) while the third footbridge has a span of about 80m., The fourth footbridge crosses the river Deva with a single span in a somewhat clearer area.

The two short-span footbridges are structurally very straightforward. The deck is simply supported by two longitudinal weathering steel girders. The system is completed with a series of transverse beams of the same material on which a layer of reinforced concrete is built on top of which the paving is laid. The outside of the side beams are constructed with a web divided into two planes to create a visually pleasing exterior, which at the same time stiffens the outer web of the beam.

The two structures with the largest spans are also simply supported. Their structural concept is a "lightened" beam and not an arch as might be inferred from their image. Its proportions are those of a variable depth beam with a maximum value at the centre of the span. Each deck consists of two lateral beams and a system of transverse beams, all made of weathering steel, on which a concrete slab is placed. The two side beams are "lightened" in their central area. This is because there the structure is subjected to a bending stress which can be broken down into a compression (free upper chord) and a tension (beam at the bottom). As there is no shear stress in this area, the web can be eliminated. In the central area it is only necessary to transfer the vertical load to the upper chord locally; for this purpose a vertical plate is provided. The "lightened" structural beam concept creates a visually slender object from the outside and at the same time creates an interesting space from the inside.



*Fig. 1. Footbridge over Deva river (Eibar)*

The four footbridges as a whole respond to the initial idea of cost-effective and low-maintenance construction, taking into account the complexity of the location and the desire to make the work visually pleasing.

**Keywords:** Context, structural concept, aesthetic, weathering steel.