



## The structural assessment of the partially collapsed Izbor Viaduct

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### Summary

On Saturday May 6th 2006, the launching of the deck superstructure of the Izbor Viaduct resulted in the partial collapse of the front section of the launched deck. This construction process of launching the deck was aided by a tower and supporting cable-stayed system that was designed to control the deflection of the leading deck section.

Arup was invited by the insurer Generali Global Risk Assicurazioni Generali to provide expert advice on the likely cause of the partial collapse of the Izbor Viaduct during construction.

The paper focuses on the analytical part of the investigation, which was carried out to determine the likely cause of the partial collapse. The material investigation and on-site inspections, which formed a part of the assessment, are not covered in this publication.

**Keywords:** viaduct; steel structure; launching; partial collapse; investigation

### 1. Introduction

The Izbor Viaduct is one of the structures along the road A-44 in the south of Spain. The road relieves traffic running from the coast of the Alboran Sea towards the city of Granada.

The superstructure of the Izbor Viaduct comprises a five-span steel truss girder and cast-in place reinforced concrete deck slab. The overall length of the viaduct of 585 m is achieved by the span configuration: 85 m + 140 m + 140 m + 110 m + 110 m. The structural depth of the truss girder is approximately 10m and the total width of the deck is 24 m. All the steel members of the viaduct are connected by means different types of welds.

On Saturday May 6th 2006, the launching of the deck superstructure of the Izbor Viaduct resulted in the partial collapse of the front section of the launched deck. The construction process of launching the deck was aided by a tower and supporting cable-stayed system that was designed to control the stresses and deflections experienced by the truss during the erection - see Figure 1.



Figure 1: Partially collapsed Izbor Viaduct

Subsequent to the partial viaduct collapse, temporary towers were installed adjacent to the partially collapsed viaduct section to support the deck and permit the installation of a replacement section of steelwork.

Arup was invited by the insurer Generali Global Risk Assicurazioni to provide expert advice on the likely cause of the partial collapse of the Izbor Viaduct during construction based on the available information. This information included drawings, specifications, construction methodology, design specifications, interim failure reports coupled with knowledge obtained from site visits.