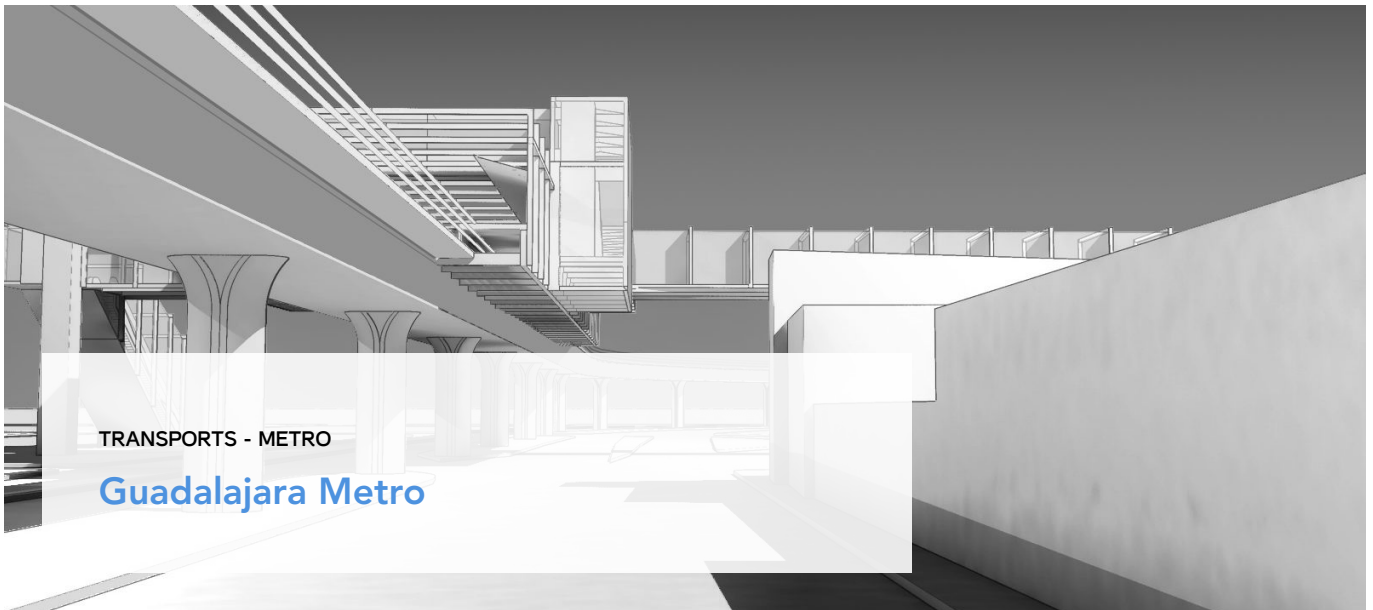




Engineering Structures for Life



## ABOUT

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Guadalajara Metro, in the project for the new line “Diagonal Zapopan-Guadalajara-Tlaquepaque”, has a full length of 20,9 km divided in 5,5 km of tunnel, 14,9 km of viaduct, and 0,5 km of transition between the viaduct and the tunnel. It includes 18 stations, 13 above ground and 5 underground. When the tendering process was launched, the project was subdivided into three sections.

At first, GEG supported one consortium, in the tendering stage, holding studies on section 1, in viaducts, and on section 2, in tunnels. There were developed optimisation studies for some of the elements of the viaduct project, a geology and TBM analysis and studies concerning the optimal solutions for trenches and excavations.

GEG intended, with this study, to optimise the current project in order to reduce costs, without, however, diminishing the aesthetics, the safety and the comfort levels expected in this kind of infrastructure.

In the solution submitted to the tendering process, the viaduct comprised a metallic deck with a 2,5 km wide central box. The columns alignments have a distance between them of about 42 m and comprised two columns each. On top of the box, there is a reinforced concrete slab, therefore, the deck works as a mixed section.

Later, at the request of the same consortium that had won the construction of section 1, through viaducts, and of section 2, through tunnels, GEG carried out a Value Engineering analysis of the detailed design patented in the tender, concerning viaducts and station structures.

As a result of the analysis of the detailed design patented in the

## FACTS

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**Year:** 2014

**Client:** Consortium GDL (SACYR, GDI, Mota-Engil Mexico and RAL)

**Services:** Conceptual design, Study of alternative solutions, Structural Engineering, Architecture, Stations and Multimodal Terminals design, Bridge and Viaduct Engineering, Light rail and Metro design, Value Engineering, Geotechnical Engineering, Geological and geotechnical characterization, Excavations and earthworks design

## TEAM

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Hugo Marques  
Raquel Campos e Matos

## LOCATION

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Guadalajara, Mexico

tendering process and concerning the execution of the stations, it was possible to design a variable by reshaping the architectural concept and guaranteeing eventual savings up to 40% in the structural steel to be used in each station.

The Value Engineering exercise aimed to maintain all the functionalities, solve some problems and submit a more efficient solution, concerning savings in materials and construction processes, as well as enhancing the flow of evacuation of passengers, station locations and accessibilities.

#### MORE IMAGES

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