



## **“Autopista Urbana Siervo de la Nación” - Flyover at México City Lake Zone: The importance of design to achieve a sustainable infrastructure during its life-cycle**

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### **Abstract**

The “Autopista Urbana Siervo de la Nación” (AUSN) Highway, is located at Mexico City, and is currently under construction. The highway, with a length of 14.5Km and 4 lanes divided in 2 carriageways (A4 type cross section), intends to target the milestone of a fast and safe road axis. The available right-of-way to built the new infrastructure presents several restrictive constraints that led to the construction of a flyover throughout approx. 90% of the AUSN total length.

The unique geotechnical scenario that characterizes the Valle de México’s lake zone, with the well-known regional settlement phenomena, along with the peculiar features that define the seismic action within the “lacustres” areas of the city, associated with high structural response amplification, lead to complex structural solutions and demanding calculations, particularly concerning the foundation’s design, optimizing the structure behaviour and minimizing the global costs during all the infrastructure’s life cycle.

**Keywords:** Flyover, Lake, “Lacustre”, Geotechnics, Viaduct, México, Earthquake, Settlements.

### **1. Introduction**

Since the early beginning, the “Autopista Urbana Siervo de la Nación”, AUSN, was a remarkable challenge for all entities involved: city developers, contractors and designers.

The project concerns an urban highway located in México City, in Ecatepec de Morelos County, and aims to establish the connection between Río de Los Remedios Avenue and Texcoco (Venta de Carpio).

6 interchanges can be found along approximately 14.5km of the main road.

1. Río de los Remedios (RR)
2. Alfredo del Mazo (AM)
3. Circunvalación Sur (CS)
4. Circuito Exterior Mexiquense (CEM)
5. Jardines de Morelos (JM)
6. Venta de Carpio (VC)

The new Highway was developed considering the typical A4 cross section, with 4 lanes divided in 2 carriageways. Hereafter the construction, tolls will