

Project identification

# Mexico City New International Airport

Type of project

Airport design with cut & cover tunnels



Client

Grupo Aeroportuario de la Ciudad de México

In co-operation with

NACO, Grupo SACMAG, Grupo TADCO

Project assignment

Responsible for conceptual and final design, support and checking of detailed design of the cut & cover tunnels

Country

Mexico

Location

Mexico City

Project duration

2015-2016

Project phase

Design phase

Construction cost

US\$9.400.000.000

Consultancy fee

€ 850.841 (December 2015)  
(excl. VAT)

**Office**

Laan 1914 no 35  
3818 EX Amersfoort  
P.O.Box 28013  
3828 ZG Amersfoort  
The Netherlands

**Telephone**

+31 (0)88 348 2540

**E-mail**

info@TEC-tunnel.com

**URL**

www.TEC-tunnel.com

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Project description

The new airport will replace the Mexico City International Airport, which is at full capacity. The new airport will have three runways to start and will be expandable to up to six runways. With three runways in simultaneous use the airport will be able to serve up to 50,000,000 passengers per year. The site for the new airport is located to the east of Mexico City. It is positioned within an area that was formally covered by Lake Texcoco; the lake has now dried up but the resulting ground and groundwater conditions are challenging.

The design of the tunnels is challenging due to the soft soil conditions, heavy airplane loads crossing the tunnels and severe seismic conditions. Although the desired longitudinal stiffness to spread airplane loads is not compatible with the desired flexibility to absorb seismic surface waves an optimal joint distance was proposed by TEC.

By deep ground water extraction the settlements amount 150mm per year. To limit differential settlements in the taxiways crossing the tunnel the weight of the tunnels is 100% balanced with the surrounding soil. To further limit potential differential settlements a transition zone next to the tunnels is developed (one of multiple mitigation measures). The transition zone consists of geotextile encased tezontle piles. The safety concept and MEP design was also developed by TEC.

Seismic study:

The study contains the results of a seismic response analysis. The execution of a site specific seismic response analysis was recommended because of the special soil conditions. The seismic input data for the calculation consist of carefully selected recorded earthquake signals, which are scaled to match the expected hazard spectra.

With the data from the seismic studies the effect on the tunnel in transverse and longitudinal direction was studied. For the longitudinal direction a special FEA model was developed to study the effect of the large seismic displacements on the joints of the tunnel.

Tunnels:

- Two Ground Service Equipment (GSE) tunnels with a length of 1300m. The GSE tunnels will be used by airport busses, catering trucks and tow-vehicles.
- Two airport utility tunnels parallel to the GSE tunnels.
- A public road tunnel used by supply trucks, passenger cars and busses carrying employees to the Support Area.
- A third GSE tunnel to connect the Maintenance Area with the Airport Support Area and Cargo.

Scope of work

TEC is a sub consultant for the NAICM project and is responsible for the tunnels and the seismic studies during the conceptual and final design phase of the project. Support and checking is provided in the detailed design phase. The tunnels in the project are constructed with the cut & cover method.