Mobility

Cebu-Cordova Link Expressway road (Philippines)

SENER MOBILITY / CARRETERAS EN / MAJOR CROSSINGS, BRIDGES & TUNNELS EN / PHILIPPINES

CEBU-CORDOVA LINK EXPRESSWAY ROAD (PHILIPPINES)

Cliente: ACCIONA ; FIRST BALFOUR

Fecha inicio: enero del 2017

País: Philippines

Fecha fin:

At SENER, we were the lead engineering firm in the detailed design of the entire Cebu-Cordova Link Expressway project, which we provided as part of a temporary joint venture with our partner CFC. As a consortium we also provided technical assistance during construction.

The scope of works developed by the consortium includes:

- **Preliminary works**, including climate studies, geotechnical campaign, reduced laboratory model tests and seismic risk analysis, among others.
- **Detailed design** of all the infrastructure needed for the expressway: causeways, sea walls, viaducts and bridges, drainage, intertidal communication passage, road surfaces, road signs, safety barriers, lighting, as well as
- part of the **installations**: electricity and lighting supply and smart transport systems (ITS), together with their associated ducting. In addition, the expressway has been fully equipped with FOE consisting of automated toll collection, traffic management and telecommunication systems; as well as some facilities to operate: Technical Service Building, electrical Service Center , pump House, guard House and toll

Booths.

CEBU-CORDOVA LINK EXPRESSWAY FEATURES

The entire project consists of a road approximately 8.9 km long that connects the islands of Cebu and Mactan-Cordova. It does so by joining the southern part of Cebu City, on the island of the same name, with Cordova. This connection may be extended in the future to Mactan-Cebu Airport, a strategic hub for the entire area of Visayas. The road meets high standards of safety, comfort and speed and will help to relieve traffic congestion on the existing bridges.

The road runs entirely over water (viaduct or causeway) and is a combination of long span high level bridge which will span the navigable portion of the Cebu Strait, a viaduct to connect the main bridge over the tidal portion of the island, a causeway over the shallow area, minor bridges and a roadway on embankment. It includes connections as follows: Cebu South Coastal Road (CSCR) viaduct in Cebu City; at-grade connection at Mactan Circumferential Road in Cordova; and at-grade connections at Sanciangko and Padilla Streets in Cebu City.

The typical carriageway cross section consists of four lanes, 3.5 m wide each. Shoulders are 0.50 m wide and outer sidewalks separated by barriers are about 1.70 m wide. The median width is 1.60 m with concrete barriers. The carriageway shall be a flexible pavement motorway with median crossings, emergency parking areas, and guardrails on both sides of the carriageway.

The Project contains other relevant structures: CSCR on/off ramps (500m); Cebu Viaduct (437.64 m), Cordova Viaduct (918.60m), Cordova Reclamation Channel Bridge (180 m), Gabi-Pilipog Bridge (300 m), Fishermen´s Bridge (60 m) and Pilipog Bridge (205 m).

TECHNICAL CHALLENGES OF THE PROJECT

Cebu-Cordova Link Expressway is an example of SENER’s technical expertise in the most technically complex projects

This was a challenging task, since the construction is entirely over water in a highly seismic area that is also hit by typhoons with winds as strong as 250 kph, all of which requires deep foundations and pile caps above the water line. Given these conditions, all the elements have deep foundations with bored piles driven into the substrate in the area, which occasionally, under the recent clay and sandy deposits, features degraded coral rock and deposits of volcanic origin.

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The main bridge uses bored piles with a diameter of between 2 and 2.5 m, while the other bridges have bored piles with a diameter ranging from 1.2 to 2 m. Similarly, to minimize the forces from the deck to the substructure in seismic situations, a damping system is used that relies on lead rubber bearings (LRB), which dissipates the energy transmitted by plasticizing the lead under dynamic loads.