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## SIX LANGUAGES AND CULTURES FOR THE DESIGN & CONSTRUCTION OF A NEW CABLE-STAYED PEDESTRIAN BRIDGE AT ALGIERS BAY

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### Summary

Working abroad, with contractors and subcontractors, designers and supervisions of different cultures and nationalities requires constant interaction between all participants. Decisions that are obvious based on current practice in their countries by some engineers may be strongly discussed by other. Current construction practices may importantly differ from country to country. In a global world, it becomes very important to emphasize the dialog at both design and construction phases and to make a very important didactic effort from the point of view of the project.

The Bay of Algiers was renowned to be one of the most beautiful in the world. However, industrial development and bad planning were responsible in recent decades of progressive deterioration of the shores, precluding the access of the citizens to the sea. The new promenade at "Les Sablettes" represents an enormous opportunity for the city to recover this degraded area. This promenade is separated from the city by the coastal highway. In order to give access to this new public space, a pedestrian bridge was required to connect the city with the sea shore. In addition, this bridge should be a new landmark in the Bay of Algiers, which leads to design an iconic structure that could emphasize the modernity of the city. The accepted solution consists on a steel bridge stayed from a single inclined pylon.

**Keywords:** pedestrian cable-stayed bridge; earthquake; steel

### 1. Discussion and Conclusions

The new promenade at "Les Sablettes" represents a huge opportunity for the city to recover the charm of the bay, since it allows recovering lost space generating equipment, recreation areas, walking areas and access to beaches (see Fig. 1). As the new promenade runs parallel to the coastal highway, leaving the city on the other side, the administration launched an invitation to bid for project and construction to build a pedestrian access over the highway in form of an iconic bridge that would underline the modernity of the city.

Cable-stayed bridges are not common in Algeria. The selected proposal consisted in a metal bridge, stayed from a single eccentric pylon, slightly inclined, intended to emphasize the rebirth of the area. The bridge, white as it corresponds to "Alger la Blanche" (*Algiers the White*), is the only gateway to the sea for the citizens of Algiers along several kilometers of the bay. Therefore, the large pylon was designed to be visible from a distance, marking the access position.

The main contractor was from Algeria, so it was the site supervisor and the owner. The designer was from Spain, although two of the members of design team were from Cuba and from Germany. The steel subcontractor was from Turkey. The erection and cable stressing was made by the Italian Tensaccai, but the cable bars were coming from Pfeiffer, a German company. While the meetings were conducted in French, you could all together hear words in Arabic, Catalan, Spanish, Italian, German and Turkish.



Fig. 1. Location and promenade "les Sablettes"

In this working environment, it is very important to have a common frame of regulations, the EN codes represent a very important help. The design was performed according to EN1993-1-11 and the execution according to EN1090-2, class EXC3. While these aids to clarify discussions, frictions always arise when applying local codes for justifying foundations or using reinforcing details different from local practices.

Cultural differences between different countries were present throughout all the process. For example, an important effort was made at design stage in explaining the solution to the client. Rendering views were complemented with what we thought was a nice conceptual scale model 1/500 made in PVC. But, this was seen too sober by the client, who immediately painted it in bright colors. Or the bridge lighting was thought by designers to be only at pedestrian level, integrated at the base of the railing, but it ended in colorful lighting of the cables.

While steel construction has the advantage that it can be prefabricated far from the site, difficulties also arose from construction of parts of the bridge overseas. The site was some weeks stopped because some of the ship containers with part of the steel structure navigating from Istanbul to Algiers ended at the sea-bed of the Mediterranean Sea, because of bad weather conditions. Or, after defining the procedure for tensioning the cables, a visit to the construction site allowed to find out, that the numbering of the cables used on site where not the same as in the technical drawings and tensioning procedure.

Building abroad, with contractors and subcontractors, designers and supervisions of different cultures and nationalities requires constant interaction between all the agents and a didactic effort very important from the point of view of the project. Project decisions that can be obvious and clear, are not so much for engineers trained in other schools, and consequently, conditions that would probably be solved by simple techniques may require some rather peculiar solutions. In the case of unique metallic structures manufactured abroad by different subcontractors, it is necessary to maximize the interaction and sometimes the imagination to minimize the problems that can be presented on site.

## 2. Acknowledgements

The bridge was built by the Algerian construction company E.T.R.H.B Groupe Haddad and the metal structure was made by the Turkish company GMB ÇELIK. Tensaccai did the stressing of cables.