

Paris, 1 May 2019

## **WITH THE INAUGURATION OF THE SHEIKH JABER AL-AHMAD AL-SABAH CAUSEWAY, SYSTRA SIGNS A REFERENCE MARITIME BRIDGE IN KUWAIT**

**On 1<sup>st</sup> May 2019, SYSTRA celebrated the official inauguration of the Sheikh Jaber Al-Ahmad Al-Sabah Causeway, also known as the Subiyah Bridge, in Kuwait. This infrastructure, built on behalf of the Public Authority for Roads and Transportation (PART), the project owner, is one of the longest maritime causeways in the world and has even set a record: 34.1km of bridge over the sea. This new crossing brings Kuwait City closer to the future city of ‘Madinat Al-Hareer’ in the north, a future zone of economic activity, with the aim of creating a central hub in the Gulf by 2030. In designing this unique infrastructure, SYSTRA has confirmed its position as an engineering world leader in the field of bridges<sup>1</sup>.**

### **A remarkable infrastructure**

This bridge links the capital Kuwait City in the south of the bay of Kuwait to the Subiyah area in the north of the Emirate, by 36.1km of technical feats (Main Link). By adding the 12.4km section (Doha Link) enabling the Doha area to connect in the west, the structure is one of the longest maritime causeways in the world with a total length of 48.5km.

For five years SYSTRA worked for the consortium formed by the South Korean firm Hyundai E&C and the Kuwaiti company CGCC, and was entrusted with the responsibility for the complete design of the main link.

The Main Link comprises a maritime bridge 26.4km long including a cable-stayed bridge with a total length of 340m and a main span of 177m, an onshore bridge of around 4.5km ensuring connection with the Ghazali interchange, two artificial islands, two reclamations and two marinas designed by our sub-contractor Artelia Gulf, 30 buildings with a total surface area of 16,000m<sup>2</sup> for management and maintenance of the project’s infrastructure, among which a panoramic tower for visitors, as well as all electrical and mechanical systems. SYSTRA also carried out the assignment of independent checking engineering for the Doha Link for the South Korean firm GS E&C in charge of the construction.

### **Innovation at the heart of SYSTRA’s project**

The accumulation of non-standard elements and technical challenges to overcome in a desert and marine environment pushed SYSTRA to implement leading edge technical and economic solutions never used before on such a scale.

“The bold option of proposing monopiles to support the structure, even in an unfavourable geological context, enabled stability, while significantly reducing seismic effects, the need for natural resources and the risk of concrete dispersion in the sea,” explains Mohamed Akraa, project director.

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<sup>1</sup> SYSTRA is ranked 8<sup>e</sup> among international engineering firms in the field of bridges, according to *Engineering News-Record* 2018

The opportunity for SYSTRA to propose a world first: the precast in a dedicated casting yard of the entire prestressed 40 and 60m spans of 950 to 1,600 tons respectively using a pre-tension system was one of the keys to the project’s success. These construction methods enabled the impacts on marine ecosystems as well as the construction risks associated with offshore works to be significantly reduced.

**A successful maritime causeway thanks to an international SYSTRA team**

Between 2013 and 2016, 14,650 drawings were produced by the 250 SYSTRA experts involved in the project. The successful coordination of multicultural teams in France, India, Kuwait, Dubai and Korea was also crucial to the project’s success. “With management of the project in Paris, and with the support of the coordination team in Kuwait, we combined know-how, united cultural differences and managed time zone issues. These teams, interconnected perfectly as one, allowed us to successfully carry out the design within the specified timeframes,” added Mohamed Akraa.

Some project figures	Some ‘Main Link’ project figures
<ul style="list-style-type: none"> <li>• 48.5km for the maritime crossing, of which 36.1km for the main link and 12.4km for the Doha Link</li> <li>• 34.1km of bridge at sea (35.9km with the ramps)</li> <li>• 2 artificial islands of 30 hectares each</li> <li>• 2 reclamations of around 30 and 60 hectares</li> <li>• A construction cost of 3.6 billion dollars</li> <li>• 5 years of studies and construction</li> </ul>	<ul style="list-style-type: none"> <li>• 1,510 bored piles</li> <li>• 1,190 piers, 24 abutments</li> <li>• 1,107 box girder spans, and 4 spans of in-situ cast slab bridge</li> <li>• 12 spans with 72 precast I-beams and in-situ slabs</li> <li>• 2 orthotropic box girders of 164m in length, for the cable-stayed bridge</li> </ul>

**About SYSTRA**

SYSTRA keeps the world moving through connecting people and places. By enabling mobility, our work strengthens communities and improves people’s access to employment, education and leisure. The Group delivers engineering, consultancy and specialist technical services that enable safe, efficient mobility and foster economic prosperity.

A recognised world leader in mobility and mass transit, SYSTRA employs 6,700 people and has an operational presence in 80 countries. Engineering News-Record ranks SYSTRA in the top five mass transit and rail international design firms, eighth in Bridges and among the 50 largest engineering firms in the world.

SYSTRA specialists plan, design, integrate, test, commission, project manage and deliver mass transit and mobility solutions that are relied upon by millions of people every day around the world. For more than 60 years we have helped cities and regions thrive through creating, improving and modernising their transport infrastructure.

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