Editor’s comment

At the entrance to an old Roman arch bridge over the Tagus River in the province of Cáceres, Spain, is an inscription by its bridge engineer: “Knowledge-hungry travellers wishing to know who built this crossing and why; this bridge, destined to last through the centuries for ever, was made by Lacer, famous for his divine art.”

In the nearly 2,000 years that have passed since Gaius Julius Lacer’s stone-wright objective of creating a long-lasting crossing with the Alcántara Bridge, it is probably safe to suggest that this goal has remained a central part of bridge engineering in all its forms and likely continue to do so.

In this issue some of the numerous and varied factors that affect longevity are explored for each stage of a bridge’s life, from its conceptual beginning as simple lines on a piece of paper to its further detailed design, specification and construction as well as onwards to its continued maintenance and possible new lease of life through repair and structural health monitoring.

This life journey is revealed as particularly complex, where even a ‘forever bridge’ built to the most exacting design, with the most durable materials and coatings, and with the best possible maintenance regime may nevertheless quickly become redundant when no longer capable of usefully serving the world around it. After all, traffic flows and modes of transport may change, as may environmental factors derived from climate change.

Considering that bridge engineers and bridge owners are not only expected to account for present-day hurdles to their uptake? José María Sánchez de Muniáin reports

José María Sánchez de Muniáin
Editor

Contents

04 DESIGNS FOR LONG LIFE: Decisions made while a bridge exists only as lines in a model can determine whether it has a long and trouble-free life. Lisa Russell talks to bridge engineers about designing and specifying for longevity

20 CONSTRUCTION FOR LONG LIFE: How do decisions taken during the construction of a bridge affect its durability? And what initiatives are under way to improve life expectancy in the highway infrastructure market? Helena Russell investigates

30 LIFE INSURANCE: The selective use of stainless steel bars can help reinforced concrete bridges in marine environments achieve longer, maintenance-free lives, writes Stephen Jones

32 LIFETIME EXPOSURE: Enabling steel, galvanised steel or steel-alloy structures to fulfill their long-term purpose is dependent on a variety of factors that range from ambient conditions during coating application to coating toxicity and structural design, writes Dave Parker

36 A NEW LEASE OF LIFE: How far is the bridge community embracing the latest technologies for inspection, non-destructive testing, repair and structural health monitoring in order to extend the life of current structures? And what are the main hurdles to their uptake? José María Sánchez de Muniáin reports

41 INDEX OF FEATURED COMPANIES

42 SPONSORED COMPANY PROFILES: Our commercial partners highlight their expertise and recent projects