

NEW SHINE AND OLD CHARM

Italy's Venice is the consummate magician. It makes marble palaces vanish into silent fogs, labyrinthine streets disappear at the whim of moody tides, and can even turn the most pedestrian of people into fantastical, masked creatures. Just like its world-famous Carnevale, Venice thrives on mystery and awe. Boasting more than 6.4 million visitors yearly, the historic center of the city remains a top global tourist destination.

TEXT: ASTRID SCHNEIDER

PHOTO: ANTONINO MONTALBANO, SIKA ITALY, RICARDO GOMEZ, I-STOCK



The Rialto Bridge has become one of the architectural icons of the city of Venice.

> The Rialto Bridge is right in the middle of all this bustle, still one of the most well-known bridges in the world. It is certainly the most famous bridge in Venice, where every day thousands of tourists take pictures, walk over it, or sail under it by gondola. It is one of the four bridges spanning the Canal Grande, the other three being the Ponte dell'Accademia, Ponte della Costituzione and Ponte degli Scalzi. The first Rialto Bridge was built in 1181, following a design by Nicolo Barattieri, but perished in a fire. It was, in fact, a pontoon bridge, and its lack of reliability forced the authorities to have a wooden bridge built after the first Ponte di Rialto was removed. Parts of the second bridge were destroyed in a fire during a rebellion in 1310, an event which triggered a series of similar incidents which finally led to the total collapse of the structure in 1524. The decision to build the present bridge was made in 1551. Construction work started in 1588 and was completed in 1591. The bridge, after a design by Antonio da Ponte, was to be made of stone, a material much more reliable and suitable for a structure as important as the Rialto Bridge. Resting on two ramps, the bridge is 48 m long with a single 22 m span arch made of stone. On either side

of the central portico, the covered ramps carry rows of shops. During the building of the bridge, many believed the project was too audacious from an engineering point of view, yet the bridge is still standing and has become one of the architectural icons of the city of Venice.

After years of bearing millions of tourists and exposure to the ravages of foot traffic and salt water, restoration finally became inevitable. The refurbishment project was based on an awareness of the bridge's strong historical, architectural and constructional heritage as a landmark of the city of Venice. Accordingly, the design took into consideration three main factors: the general architectural design, preservation of the materials, and structural strengthening. Under the restoration project, all of the bridge's structural elements are being treated for the first time in more than 400 years. A team of 25 conservators dismantled the sandstone paving on the central steps and the two exterior ramps for cleaning.

To protect the northern and southern balustrades from the lagoon's brackish waters, as well as the tourists who walk across it, the banisters were reinforced

using carbon-fiber bandages and duplex stainless steel brackets that resist corrosion. The 364 columns, which presented fractures on their capitals and bases, were also reset in molten lead, and some of the cornerstones were completely replaced.

Sika became involved in this project in the latter part of 2015. The ultimate goals were to carry out the restoration, maintenance and overall refurbishment of the Rialto Bridge, while preserving the architectural nature of the original materials by applying non-invasive yet efficient structural solutions, as well as to stop the decay of its structure and materials.

Both sides of the Rialto Bridge are bordered by a balustrade made of Istria stone. The balustrade protrudes beyond the external edge of the masonry arch and rests on stone cantilevers anchored underneath the deck. Upon removal of the stone deck, numerous cantilevers supporting the balustrade revealed cracks, and the balustrade rotated outward slightly.

>



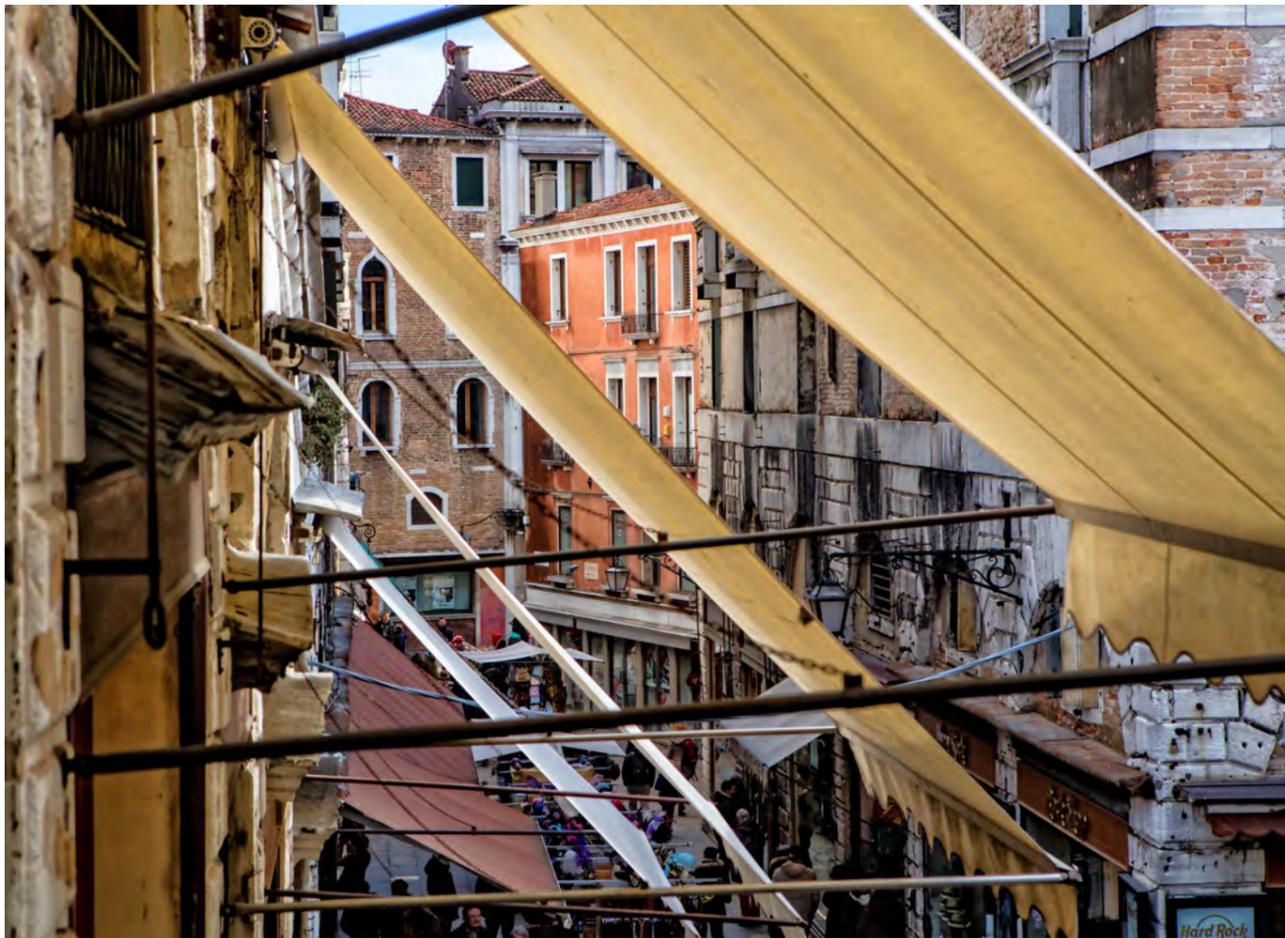
The entire strengthening solution is now absolutely non-invasive and invisible as it is hidden under the deck.



Sika provided SikaWrap® to reinforce the stone cantilevers and to increase the safety of the balustrade.

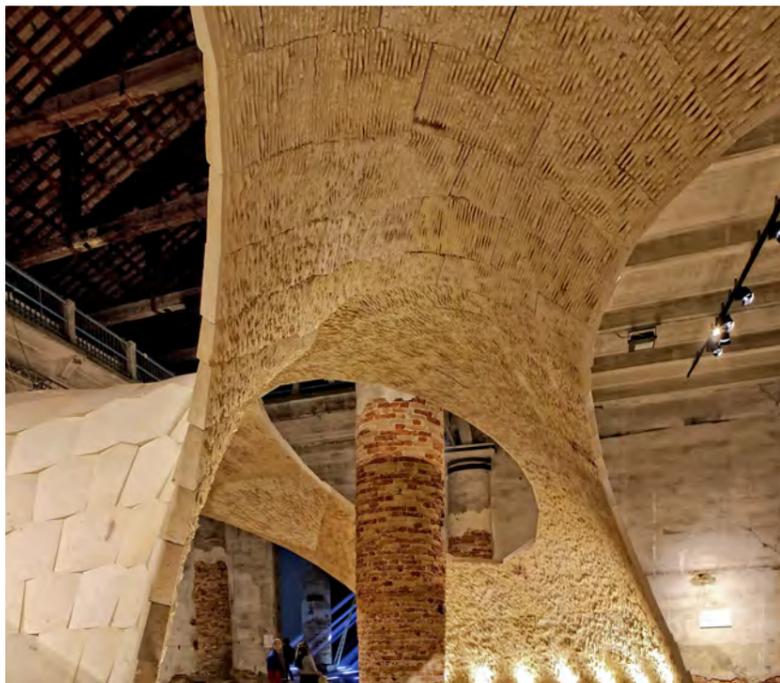
A must-see for every visitor: resting on two ramps, the Rialto Bridge is 48 meters long with a single 22-meter span arch made of stone.





View to a sidewalk going down the Rialto Bridge.

- > Sika provided solutions such as the FRP structural strengthening system SikaWrap® to reinforce the stone cantilevers and to increase the safety of the balustrade, blocking further rotations. The entire strengthening solution is absolutely non-invasive and invisible as it is hidden under the deck. A special procedure developed by Sika was used for the application of SikaWrap® FX-50 C connectors. This procedure allows the connectors to be applied "all-at-once". At first, holes in the stone were drilled and thoroughly cleaned with compressed air and a round brush, then the holes were partially filled with Sika AnchorFix® from the bottom up. SikaWrap® FX-50 C carbon-fiber connectors were impregnated with Sikadur® Injection, inserted in the holes and spread on the surface of the stone. The SikaWrap® carbon-fiber fabric was cut to size and impregnated with Sikadur® epoxy resin directly on the substrate, after precise preparation and cleaning of the stone surface.

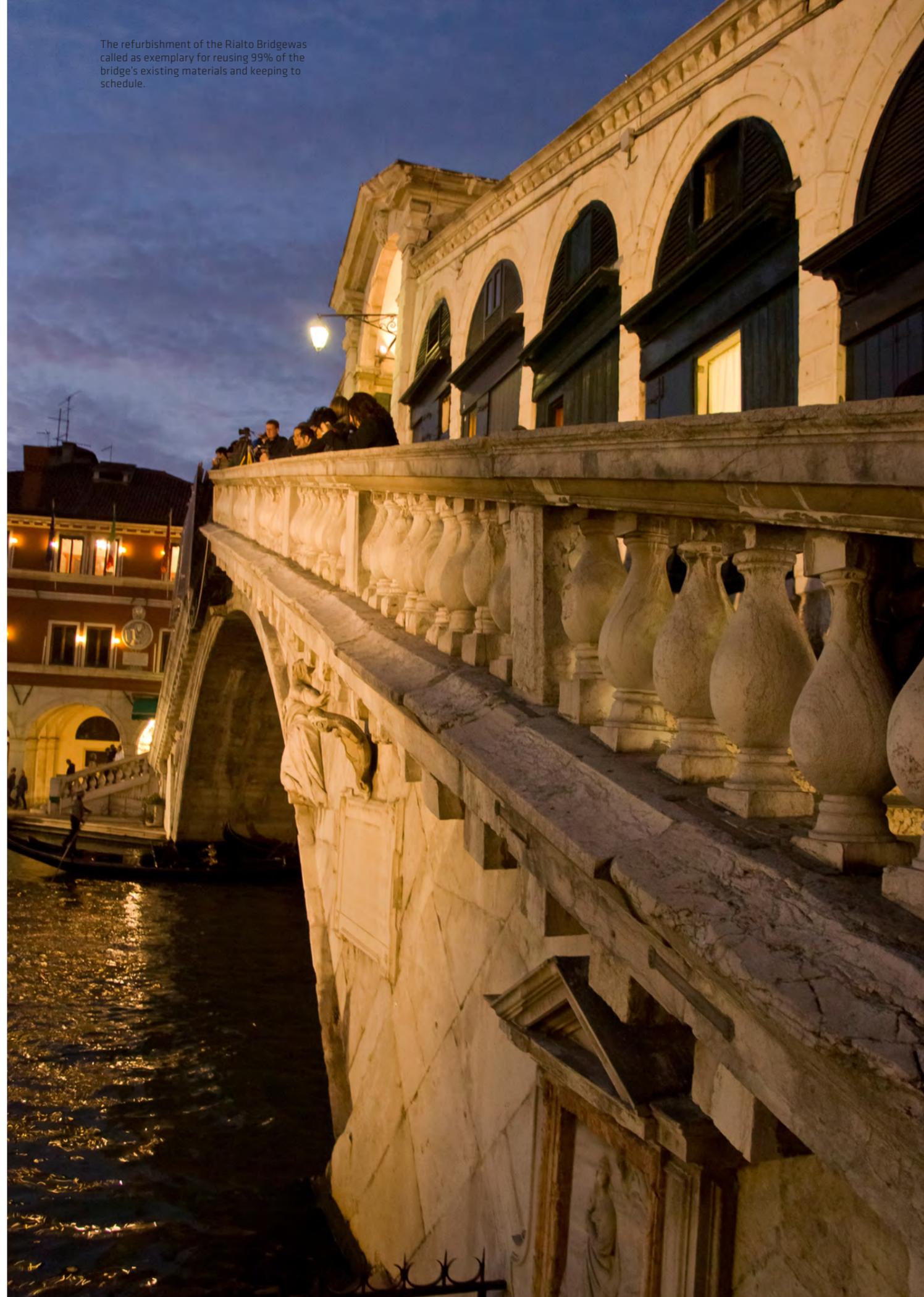


La Biennale di Venezia is now one of the most prestigious cultural organizations in the world. This shot shows the exhibition of 2016.

Local newspaper La Nuova di Venezia has already hailed the project as exemplary for reusing 99% of the bridge's existing materials and keeping to schedule. But

the official inauguration of the refreshed structure will have to wait until May as the city council has timed the event to coincide with the opening of the Venice Biennale. So if you are in Venice then,

take a little time away from the delights of art, architecture and film that the Biennale has to offer and walk across the newly opened Rialto Bridge with its new shine and old charm. <



The refurbishment of the Rialto Bridge was called as exemplary for reusing 99% of the bridge's existing materials and keeping to schedule.