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Bridging the gorge with duplex

A spectacular footbridge along Cornwall's rugged coast replaces a lost land link and reconnects the two halves of Tintagel Castle, one of Britain's most legendary historic sites. Designed to endure Cornwall's harsh coastal climate, the footbridge blends old and new – linking not just rock to rock, but past to present.

On the north coast of Cornwall, waves crash against steep cliffs carved by centuries of salt and wind. Perched on a rocky outcrop of land jutting into the sea, the fragmented ruins of Tintagel Castle evoke stories of myth and monarchy. The site has long captivated its 200,000 yearly visitors with a breathtaking setting and a storied role in one of Britain's most enduring legends: the birthplace of King Arthur.

The castle was originally connected to both the mainland and its gatehouse by a slender natural land bridge. But over time, that connection was lost to erosion. For centuries, only steep staircases offered access to the remains of the medieval stronghold. This isolation may have preserved the mystery, but it also created practical challenges. Heavy visitor traffic in peak seasons led to bottlenecks, wear on fragile archaeological remains, and limited access for many would-be explorers.

Ruins of the castle, originally built in the 5th century and rebuilt in the 13th century, span both sides of the bridge.

Recreating the original link

To reconnect Tintagel's divided landscape and enhance the visitor experience, English Heritage launched an international competition. The goal was to enable more people to discover the site and better understand its historical significance. The winning concept, a collaboration between Ney & Partners and William Matthews Associates, offered an elegant and symbolic answer: two cantilevered arms stretching out from either side of the gorge, nearly meeting in the middle.

Instead of a traditional continuous span, the design features a 40-millimeter gap at the center, representing the threshold between the mainland and the headland, present and past, reality and legend. Visitors physically cross the divide that nature once created and experience the landscape as it might have felt in the 13th century, when Tintagel Castle was last fully connected.

Braving the elements

Cornwall's dramatic coast is beautiful, but brutal. Gusty winds, salty air, and driving rain push any construction to its limits. Materials must withstand this corrosive marine environment with minimal maintenance and a very long lifespan. To meet these demands, the design team

By echoing the approximate width and length of the natural land bridge that collapsed into the water long ago, the new bridge reconnects the two separated sections of the castle site.

Using a cable crane, crews lifted steel segments from the headland and assembled them mid-air on cantilevers extending across the gorge.

specified a combination of painted carbon steel and duplex stainless steel. The bridge's main structural chords, which carry tension and compression forces back to the abutments, are fabricated from painted carbon steel. These structural chords can be repainted if needed.

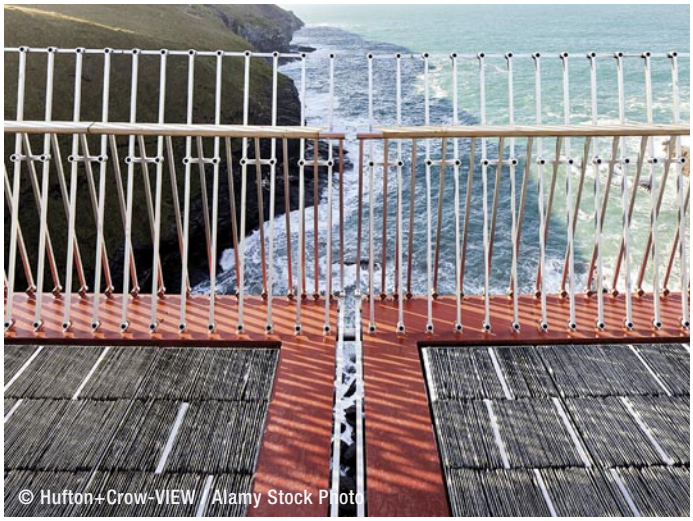
The more delicate elements – cross bracing, railings, and deck trays – were made from 2205 duplex stainless steel. This alloy contains around 3% molybdenum, which significantly enhances resistance to atmospheric corrosion, particularly in chloride-rich coastal environments. Molybdenum inhibits pitting and crevice corrosion, extending the life of the components without the need for protective coatings.

Assembling across the abyss

Construction logistics posed another challenge. The remote location lacked road access for heavy machinery, and cranes could not be used in the 60-meter-deep gorge. The solution? Divide the steel structure into transportable sections, deliver them by narrow road, and hoist them into place using a cable crane system – more typical of alpine construction than British heritage sites.

Both 33-meter halves of the bridge are composed of six prefabricated steel segments, each weighing less than five tonnes. These were lifted into place, then joined using interlocking steel plates that slide together without temporary supports, and secured with bolts. This method allowed the structure to be built outwards into thin air, segment by segment. The intentional gap in the center enables each bridge half to expand and contract with variations in temperature.

The central gap between the two cantilevers is about 40 millimeters wide.



Where the bridge meets the rock, it stands 4.5 meters tall, tapering to just 170 millimeters at the midpoint. A series of 16-meter-long rock anchors secures the cantilevers deep into the cliff face. Slender diagonals and cross bracing handle shear forces, using rectangular duplex stainless steel hollow sections as small as 30 x 30 millimeters in some locations.

Slate, steel, and storytelling

The bridge is paved with 40,000 hand-split Delabole slates – mined just two miles from the site – stacked vertically in stainless steel trays. This unique detailing creates a rich, tactile walking surface that draws on Cornwall's local building traditions. The handrail is fashioned from untreated English oak, chosen for its natural patina and minimal visual impact.

Along their length, the railings are made from slim duplex stainless steel rods. So fine are these elements that from a distance they disappear against the sky. This subtlety is deliberate. The design minimizes visual conflict with the castle's ruins, maintaining a respectful distance from the archaeology. And the use of resilient materials means the bridge can endure for generations, with minimal intervention or distraction.

A new chapter for an ancient site

English Heritage's Chief Executive Kate Mavor remarked: "Tintagel Castle has been made whole again. Once more, people will cross from one side of the castle to the other and their footsteps will echo those from hundreds of years ago". The bridge's symbolism is as powerful as its engineering. It offers barrier-free access to one of Britain's most iconic landscapes. It protects the fragile archaeologic site by relieving crowding on vulnerable pathways. And it showcases how modern materials – like molybdenum-alloyed stainless steel – can enable bold design in the most sensitive of settings. (Martina Helzel)

With its delicate structure, the bridge blends seamlessly with the iconic coastal landscape, without competing visually with the nearby castle ruins.