

Kanmon Railway Tunnel

The Kanmon Railway Tunnel was the world's first under-ocean tunnel. It connects the islands of Honshu and Kyushu beneath the Kanmon Strait. Construction began in 1936 and was completed during the turmoil of the Pacific War. The Kyushu-bound line of the tunnel (3,614 m) was completed in 1942, followed in 1944 by the Honshu-bound line (3,604 m). Even today, the tunnel is a remarkable feat of engineering, but at the time of its construction, it was a groundbreaking advancement.

Meiji-Era Origins

As the nineteenth century drew to a close, Japan was determined to reinvent itself as a modernized world power. Rapid industrialization and militarization were the order of the day, and the idea of a transport link (a bridge or tunnel) connecting Honshu and Kyushu was first suggested in 1896, but it was several decades until the idea became reality.

The Kanmon Tunnel was used to haul coal from the mines of Kyushu to the fuel-hungry factories of eastern Japan, but that was not its sole planned purpose. The tunnel also had significant military and strategic value. Despite the extreme technical difficulties involved, an under-ocean tunnel was chosen for a simple reason: it would be harder to bomb. This unassailability was vital for maintaining a supply route to Moji Port, from where Japan's military was deployed across Asia.

Cutting-Edge Technology

The tunnel designers and engineers were nothing if not ambitious. Japan's complex topography and geology made tunnel construction difficult, and in the case of the Kanmon Tunnel, the laborious work of boring, drilling, and excavating had to be carried out below more than 12 meters of water.

Intense political and military pressure pushed the project forward at a breakneck pace. Test drilling began at sea in 1919, and engineers were discreetly dispatched to the United States to survey existing riverbed tunnels, such as the one under the Hudson River. Construction on the Honshu side was done using mountain-tunneling techniques, whereas caissons and shield tunneling were used for the softer ground on the Kyushu side. Shield tunneling was pioneered by Marc Isambard Brunel (1769–1849) during construction of the Thames Tunnel (1825) in London. The trenchless construction technique allows for continuous boring while ensuring the safety of the digging crew. Its application for the

Kanmon Tunnel was the first time the technology was put to large-scale use in Japan.