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Rion–Antirion Bridge: Maurer Söhne produces Expansion Joint featuring the world's largest movement capacity.

Failure-engineered design allows seismic safety

Munich. More than five metres of movement both in longitudinal and also transverse direction – that way, Messrs. Maurer Söhne, Munich set a new bench mark concerning expansion joints in bridge construction. The earthquake-proof carriageway expansion joint has been produced for the bridge from Rion to Antirion crossing the Gulf of Corinth in Greece. First two expansion joints meant for one side of the bridge are on its way to construction site since August 21 and are scheduled to be installed there in December this year.

The bridge from Rion to Antirion nearby Patras has a total length of 2,880 metres. It builds up from the two access bridges supported on pier heads as continuous girders and the 2,550 m long core part, a five span cable-stayed bridge. Challenge set to the bridge builders is not only to overcome the Gulf of Corinth itself but also the fact that there run two continental plates in the depth of that sea arm. Tensions resulting from this regularly cause earthquakes: There are seven, each of a value of more than 4.5 on the Richter scale that were registered the past hundred years, the last from 1995 with a value of 6.2 on the Richter scale.

Normal operation and earthquake case

Theoretically, construction of a huge expansion joint for Rion Antirion Bridge that also copes with the design-earthquake movements might have been imaginable. Though Maurer Söhne chose another way: „That expansion joint, which is one of the world's largest ones, will cope with normal op-

Explanation:
Movement gaps or expansion joints ...
... are the flexible connections of bridges to the mainland. Every car driver can recognize them by the characteristic „clack-clack"-noise (unless he is crossing a low-noise joint of Messrs Maurer Söhne, equipped with the patented noise-reduction system ...). The task of expansion joints is to accommodate the relative movement between bridge and abutment, mainly resulting from temperature differences.
Messrs. Maurer Söhne are international market leader for expansion joints. That is why for many experts the expression "Maurer joint" is a general synonym for expansion joints.

MAU_Dehnfuge1.jpg

The expansion joint hovers: On 21st August the expansion joint of 13.9 meters in length, 5.30 m in width and 1.6 metres in height (loading condition) had been steered to the loading place by special crane.

Photo: Maurer Söhne

MAU_Dehnfuge2.jpg

Precision work: The 56 t expansion joint was supported on the special truck on pre-fabricated crossbars. Looking at the joint from underneath the support bars can be detected. These support bars support the centre beams which will have direct contact with the overrolling wheels. The skewed arrangement of the support bars is responsible for the geometrical control of every single centre beam-movement as well as for the equal distribution of the total movement to the single gaps between the centre beams. The seismic protection system is located at the edges of the expansion joint.

Photo: Maurer Söhne

MAU_Dehnfuge3.jpg

The driver's cab of the special heavy load truck at right hand apparently looking very tiny as well as the three workers underline the dimension of the expansion joint, which in case of earthquake can equalize more than 5 metres of movement in longitudinal bridge direction and ± 2.6 metres in lateral direction.

Photo: Maurer Söhne

MAU_Dehnfuge4.jpg

The first heavy load truck shortly before its departure to Greece. On the left side, the support bars rise above the edge beam of the joint, while on the joint surface several beams secure the preset gap opening of the joint.

Photo: Maurer Söhne