XL 1
... the low noise emission MAURER single seal expansion joint

- Economic design of the expansion joint as well as of the adjacent connecting structure
- Long service life, maintenance free
- Watertight as per the proven MAURER design

MAURER XL 1 Expansion Joints employ 1 strip seal and noise reducing wave shaped plates on the surface of the carriageway. The continuous surface facilitates the increase of the permissible gap width to 100 mm without impediment of the riding comfort and the safety of traffic, in particular for bicycles and pedestrians. Further, this design leads to a considerable enhancement of the scope of application of single seal expansion joints, and featuring a reduction of noise emission for residents living nearby. Conventional single seal expansion joints are designed for a maximum gap width of 60 mm to 80 mm – in Germany 70 mm. With obtaining the General Approval of the German Federal Ministry of Transportation, this design allows an enhancement of the maximum gap width to a maximum of 100 mm for movements perpendicular to the carriageway.

Skew movements can be executed in an angle of up to 30° - beyond this angle, the wave plates can additionally protect against damages caused by snow ploughs.

Depending on the gap width, also separately occurring longitudinal movements can be adoped.

In Germany, the design of expansion joints with 1 strip seal is governed in the Directive Drawing “Übe1”, and in the regulation ZTV-ING. According to these specifications, the edge beams, their connection to the anchorage, the proof of functionality (in particular of the strip seal), as well as the butt connections of edge beams and strip seal must correspond to the requirements of multi-seal expansion joints.

Due to the fact that the load transferring function deviates from the one as specified in the Directive Drawing “Übe1”, for the design and production of low noise emission watertight expansion joints a design check according to the provisions of TL/TP-ING FÜ is mandatory. Because the German Federal Ministry of Transportation does not yet foresee a General Approval, an individual approval in every single case is required.

The respective design calculations for MAURER XL 1 Expansion Joints were already provided several times for individual design checks. For expansion joints of type XL200 to 600 with similar design, a valid General Approval exists already. In Austria, the XL 1 expansion joint already enjoys the General Approval.
The standard design of MAURER XL 1 expansion joints depicts on one side a fixation of the wave shaped plates by means of continuously prestressed screws, which allows the replacement of the strip seal while the expansion joint remains installed. In case of movements of less than 20 mm, also welding connection at both edges is possible.

The following requirements according to the German specification named “ZTV-ING TL/ TP-ING/ FÜ” shall be highlighted:

- Selection of an approved design checkers
- Costs are charged to the applicant
- Proof that calculated movements can be adopted
- Calculation with loads according DIN 1072
- Fatigue proof according TL/ TP-ING/ FÜ
- Service life of structural members to be 40 years
- Service life of strip seal to be 20 years
- Proof of watertightness
- Proof that the strip seal can be replaced
- Minimum jacking up of 10 mm for the replacement of bearings
- Submission of MPA-Test Reports
- Working instructions for the butt connections of strip seal and edge beams
- Working instruction for screwed connections
- Working instructions for maintenance
- Welding Certificate acc. DIN 18800-7
- Proof of capability of welding of reinforcement bars
- Self and Third Party Supervision („Ü-Mark“)

According to the General Circular (ARS) Nr. 15/2002 of the German Federal Ministry of Transportation, the use of low noise emission expansion joints is only envisaged from 4 sealing elements or more. Reason is in particular of economic nature. If we take into consideration that that with the use of the XL 1 joint type in case of movements exceeding 65 mm, multi seal expansion joints or finger joints need not be envisaged, and consequently also the required maintenance access according directive drawing “Was 6” can be made obsolete, we suggest this General Circular to be reconsidered. In case of resilient support of bridges by means of elastomeric bearings, according to General Circular ARS 8/2000 the gap with in case of translations caused by braking forces can be increased by additional 10 mm. Generally, these considerations apply also for the XL 1 type.

Abutment with and without maintenance access according Directive Drawing “Was 5/6”

Also possible is a retrofit or a redesign of existing expansion joints

Redesign of a D160 (box seal) into type Type XL 1