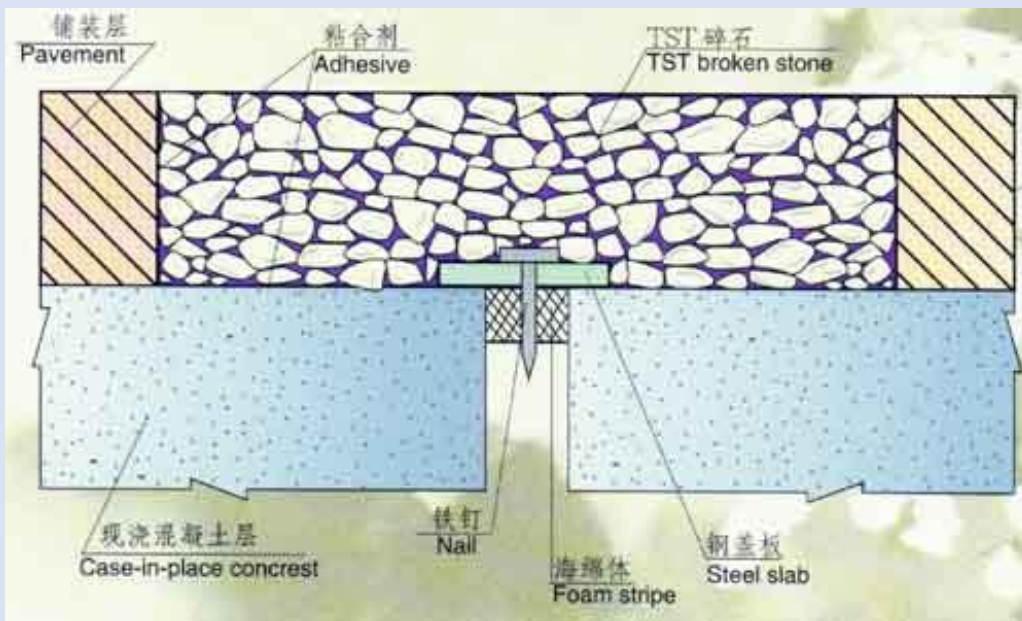


# 1. Structural composition

The device is composed of four elements: supporting steel plate, high elastic adhesive, single graded crushed stone aggregate and packing material. It replaces the normal expansion joint structure.

## 1. 结构组成

该装置由四个元件组成：支撑钢板、高弹性粘合剂、单级配碎石骨料和包装材料。它取代了正常的伸缩缝结构。



## 2、 Construction principle

From a mechanical perspective, filling materials exhibit complete elasticity when subjected to instantaneous loads and high-frequency vibrations, while under low-frequency slow forces, they exhibit complete plasticity. When the wheels pass, the vibration of the bridge is high-frequency, and the elastic body shows elasticity; When the temperature changes and the bridge contracts, it belongs to low-frequency slow force, and the elastic-plastic body shows complete plasticity.

### 2、 施工原则

从力学角度来看，填充材料在受到瞬时载荷和高频振动时表现出完全的弹性，而在低频慢速力下，它们表现出完全塑性。当车轮通过时，桥梁的振动是高频的，弹性体表现出弹性；当温度变化和桥梁收缩时，属于低频慢力，弹塑性体表现出完全塑性。

### 3.construction technology

1.

Cutting notches; Based on the expansion and contraction of the bridge, determine the reasonable size of the groove. After determining the size of the groove, mark a waterline at the position of the saw mouth. Then use a toothless saw to cut along the line, keeping the groove line parallel to ensure the aesthetics of the bridge head joint.

#### 3.施工技术

1.

切割槽口；根据桥梁的伸缩情况，确定合理的沟槽尺寸。确定凹槽的尺寸后，在锯口的位置标记一条水线。然后用无齿锯沿着线切割，保持凹槽线平行，以确保桥头接头的美观。

2.

Clean, use a wire brush to clean the groove, blow it clean with an air compressor, and then bake the groove with a fire gun to ensure that the bonding surface is dry (if conditions permit, it is best to rinse it with a high-pressure water gun, and then dry it with a fire gun). Pay attention to controlling the baking time to avoid softening and deformation of the incision. High temperature resistant

sponge filler strip shall be embedded at the expansion joint of the bridge to prevent TST molten materials from flowing out.

2.

清洁，用钢丝刷清洁凹槽，用空气压缩机吹干净，然后用消防枪烘烤凹槽，确保粘合表面干燥（如果条件允许，最好用高压水枪冲洗干净，然后再用消防枪烘干）。注意控制烘烤的时间，避免切口软化变形。桥梁伸缩缝处应预埋耐高温海绵填充条，以防止 TST 熔融材料流出。

3.

After melting the TST material, evenly coat the bottom and both sides of the groove. Be careful not to leave any space to prevent the loose connection between the crushed stone and the groove from falling off, causing damage to the bridge joint. Place a 2-4mm thick steel plate (the width of the steel plate is determined by the width of the joint, usually about 15 cm) in the center of the groove, Then apply another layer of TST melted material to the steel plate.

3.

熔化 TST 材料后，均匀地涂覆凹槽的底部和两侧。注意不要留下任何空间，以防止碎石和凹槽之间的松散连接脱落，对桥梁接缝造成损坏。在凹槽中心放置一块

2-4mm 厚的钢板（钢板的宽度由接缝的宽度决定，通常约为 15cm），然后在钢板上再涂一层 TST 融化材料。

4.

Main layer construction: Select hard limestone crushed stones (about 1.2 centimeters) with edges and good compression properties, with a crushing value of no more than 30%, a needle like content of no more than 15-20%, and good grading. The stones must be clean and heated at a temperature of 170-190 °C. Mix the heated crushed stones with TST material and evenly place them in the groove, Immediately pour TST at 170-190 °C to dissolve overnight. The alternating flow of TST immediately fills the gaps between the crushed stones, and binds the scattered orange crushed stones together to form the main layer of TST crushed stones. The usage of TST material is 660-710 kilograms per cubic meter (slot width 60 centimeters, slot depth 17 centimeters), approximately 73 kilograms per meter

4.

主要层施工：选用坚硬的石灰石碎石（约 1.2 厘米），具有边缘和良好的压缩性能，压碎值不超过 30%，针状含量不超过 15-20%，级配良好。这些石头必须是干净的，并在 170-190°C 的温度下加热。将加热后的碎石与

TST 材料混合，并将其均匀放置在凹槽中，立即在 170-190℃ 下倒入 TST，使其溶解过夜。TST 的交替流动立即填充了碎石之间的空隙，并将分散的橙色碎石结合在一起，形成 TST 碎石的主要层。TST 材料的使用量为 660-710 千克/立方米（槽宽 60 厘米，槽深 17 厘米），约 73 千克/米

5.  
Surface construction: Mix the heated surface stone material thoroughly with the hot TST sol. To prevent uneven mixing due to temperature drop, heat it appropriately with fire. Immediately lay the surface crushed stone on the main layer and compact it with an iron pier. Due to the good elasticity of TST crushed stone at room temperature, compaction must be done in a timely manner to prevent early damage caused by insufficient compaction due to temperature drop. During surface construction, the height difference from the original road surface should be adjusted appropriately according to the seasons to prevent obvious jumping sensation during driving.

5.  
表面施工：将加热的表面石材与热 TST 溶胶充分混合。为了防止由于温度下降而造成混合不均匀，请用火适当



加热。立即将表面碎石铺设在主层上，并用铁墩将其压实。由于 TST 碎石在室温下具有良好的弹性，必须及时压实，防止因温度下降导致压实不足而造成早期损坏。路面施工时，应根据季节适当调整与原路面的高差，防止行车时有明显的跳跃感。

6.  
Trimming: After the construction of the surface stone material is completed, apply high-temperature resistant kraft paper tape on both sides of the seam one centimeter beyond the groove to ensure the smooth and straight edge line. Use a hanging board to scrape another layer of TST sol on the seam to the width of the kraft paper tape, and then use a flame gun to bake the surface layer to make it flat. Remove the paper tape as you bake. The width of the paper tape is one centimeter beyond the notch, and its function is to enhance the adhesion between the crushed stone itself and the road surface. During construction, make sure to keep the edges straight and the surface flat.

6.  
修整：表面石材施工完成后，在接缝两侧超出凹槽一厘米处用耐高温牛皮纸胶带，以确保边缘线光滑平直。用挂板在接缝上刮一层 TST 溶胶，刮到牛皮纸胶带的宽度，

然后用火焰枪烘烤表层，使其平整。烤的时候把胶带取下来。纸带的宽度超过缺口一厘米，其作用是增强碎石本身与路面之间的附着力。施工过程中，确保边缘平直，表面平整。

## **4.matters needing attention**

(1) The depth of the groove should not be too small, otherwise it will result in insufficient adhesive force on the end face.

### **4.注意事项**

(1) 凹槽的深度不能太小，否则会导致端面附着力不足。

(2) The trench must be cleaned thoroughly to avoid leaving floating soil and loose particles.

(2) 沟槽必须彻底清洁，以避免留下漂浮的土壤和松散的颗粒。

(3) The groove must be dry, and it is best to heat the surface with a flamethrower before filling, which is beneficial for the bonding material to adhere firmly to the interface.

(3) 凹槽必须干燥，填充前最好用火焰喷射器加热表面，这有利于粘合材料牢固地粘附在界面上

## **5.Construction tips:**



## 5.施工提示:

1. Generally, traffic can be opened within 1-3 hours after construction, and if necessary, forced cooling can be used. It can be opened to traffic within about 1 hour, and it will not affect the construction of the other half of the bridge deck after opening to traffic.

1.一般情况下施工后 1-3 小时即可开放交通，必要时用强制冷却，1 小时左右即可通车，通车后不会影响另一半桥面施工。

2. Construction should not be carried out in weather conditions where the wind force is greater than level 3 and the temperature is lower than 10 °C.

2.风力大于 3 级，温度低于 10°C 的天气情况下，不宜施工。

3. TST elastoplastic body, heating temperature 190-210 °C, short time 230 °C, insulation time should not exceed 2 hours.

3.TST 弹塑体，加热温度 190-210°C，短时间 230°C，保温时间不得超过 2 小时。

4. Stone heating, heating, and temperature control at 100-150 °C.

4.石料加温、加热、温度控制在 100-150°C。