Wirtgen | Recycling of Hand-Packed Stone Pavement in a Single Pass

On-Site Crushing, Mixing, and Screening

The L98, a two-lane country road, closely follows the course of the river Moselle in the shadow of the medieval castle Burg Metternich. As an important part of this economic region’s infrastructure, it is essential that the road is kept in good condition. Around 3 km of the road in the area around the municipality of Beilstein was in need of structural rehabilitation. After milling off the asphalt surface layer, the remainder of the asphalt binder course, and the underlying hand-packed stone layer were crushed and processed in situ in a single pass by a WRC 240i Rock Crusher from Wirtgen. The aim of this was the creation of a new, homogeneous base layer that would provide enduring resistance to the axle loads of future heavy traffic.

An Alternative to Conventional Processing

Hand-packed stone layers such as on the L98, or base layers containing large pieces of stone, as often used in the past, mean that traditional rehabilitation can be extremely laborious, and that conventional processing is particularly time consuming and costly. Above all the transportation of material takes time and is expensive. With the WRC 240i Rock Crusher, Wirtgen offers a more economical solution and an alternative for the realization of this task. The WRC also impressed with its productivity, the achievable working depth, and the quality of the material it produced.

Heavy-Duty Crushing and Mixing Rotor

The crushing and mixing rotor of the WRC 240i processed the existing binder course and the underlying hand-packed stone layer with its HT18 crushing tools to a depth of 35 cm. In the crushing process, the variable and fixed crushing stages ensured that the pieces of stone were fragmented piece by piece to the required size by impact crushing. The screen unit with a mesh size of 45 mm in the rear part of the crushing and mixing chamber determined the fragment size of the crushed material. In this way, a new, high-quality homogeneously mixed base layer was created in situ in accordance with the project specifications to a working depth of 35 cm.

In-Situ Crushing and Mixing Replaces Transportation of Material to and from the Site

With a working width of 2.32 m and an advance rate of around 7 m/min, the machine achieved a crushing rate of 600 tonnes of material per hour. On the project site, the total volume of material produced in-situ by the Wirtgen Rock Crusher amounted to around 11,900 t and eliminated the need for transporting approximately 1,200 truckloads of processed or new material to and from the construction site. After compaction, the new crushed stone base layer was ready for the placement of the overlying asphalt binder course and the paving of the asphalt surface layer.

Reduced Emissions, Shorter Project Completion Time and Lower Costs

The use of the Wirtgen Rock Crusher significantly reduced not only the transport costs, but also the overall CO₂ emissions. In this case, the emissions were able to be reduced by 66 percent. The construction costs for the creation of an unbound, homogeneous base layer were reduced by 75 percent and the project completion time was shortened by 55 percent. This meant that the section of the L98 was ready for asphalt paving within only two days and was very soon able to be opened to traffic again.

Project Details:

Working width: 2.32 m  
Working depth⁢: 35 cm  
Screen mesh size: 45 mm   
Average advance rate: 7 m/min

Crushing rate WRC: 600 t/h   
Total material volume: 11,900 t   
Total area: 20,000 m²   
Edge length of hand packed stones: <300 mm

Savings Compared to Conventional Methods  
CO₂ emissions: 66%

Construction costs: 75%

Project completion time: 55%

**Photos:**



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The Wirtgen Rock Crusher processed and recycled an area of over 20,000 m² within two days.

  
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Using the WRC 240i as a sustainable alternative to conventional processing methods on road rehabilitation projects enables a reduction of CO₂ emissions, completion times, and costs.

  
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The Wirtgen Rock Crusher can crush hand packed stone layers and individual stones with edge lengths of up to 300 mm.

  
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Thanks to the variable and fixed crushing stages, the pieces of stone were fragmented to the required size of 45 mm by impact crushing.

  
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The WRC 240i ensures a homogeneous mixing result at a working depth of up to 35 cm.

Note: the photographs shown here are only previews. If you wish to publish them in other media, please download the higher resolution (300 dpi) versions from the link provided here.

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