



**STRAIL<sup>astic</sup>** **STRAIL<sup>WAY</sup>**



# STRAILastic\_IP



## Project Report / Rheindiebach

Subject to technical changes / May 2017 / BBA



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## # 1 / GENERAL

In summer 2016 another important project regarding sound protection at railway tracks could be implemented in Rheindiebach in Rhine Valley.

### 1.1 Rheindiebach

The Rheindiebach district (Rhineland-Palatinate) is situated on the left side of the Rhine river between Koblenz and Bingen and only a few kilometres south of Oberwesel (see project report Oberwesel).

The Oberdiebach municipality has been part of the „Upper Middle Rhine Valley“ UNESCO World Heritage site since 2002.

### 1.2 Traffic and sound-related situation

The double-tracked railway line 2630 (km 140.559 to km 140.653) runs through the Rheindiebach district. This line is very busy with both passenger and freight trains by day and night. This creates an extensive noise exposure for the residents, which is even amplified by the road and railway traffic on the right side of the Rhine due to local conditions and the sound reflection from the water surface of the Rhine.

Originally, the infill panels should be installed on the opposite side of the Rhine at the height of Oberwesel in the town of Kaub. However, due to some changes, Rheindiebach was chosen for the installation.





## # 2 / INSTALLATION

The installation was carried out in June/July 2016 in three main steps under our supervision. The organisation of the project was also done by **STRAIL**.

### 2.1 Preparations

First, the existing aluminium railing had to be removed since it was not designed to withstand increased wind and surface loads. After removing the aluminium railing, several reparation and concrete work had to be done. In the process, an underpass for pedestrians and cyclists was furnished with an additional steel girder for support and for the foundation of the railings.



### 2.2 Railing

Afterwards, a new railing with an adequate design according to clear specifications by Deutsche Bahn (DB guideline „RIL804“) was installed. The company „Metall- und Fahrzeugbau Gehrlich“ was commissioned with the adaption and the installation of the railing.



### 2.3 Infill Panels STRAILastic\_IP

The third step was the installation of the **STRAILastic\_IP** infill panels. All work steps were carried out under supervision by a safety officer from Deutsche Bahn. First, the rubber elements were prepared for the installation at the railing. For that purpose, recesses were made for projecting TOGE mounting plugs of the railing. To make these recesses, standard tools and machines for wood working could be used.

Afterwards, the rubber panels were lifted over the railing by using suitable lifting gear (crawler excavator) and put in the correct position. To protect the head beam a railing protection was used for the positioning.

After the positioning of the fastenings the infill panels could be mounted. Every element was attached to the railing with 8 fastenings. By means of the metal rails which had been vulcanised onto the elements a 22 cm distance to the filling rods could be overcome. Railings with eccentric filling rods can also be used. In that case, different clamping adapters overcome the eccentricity of the filling rods. This makes the infill panels well adaptable for different standard railings of Deutsche Bahn.

A total of five service technicians were involved in the installation of the **STRAILastic\_IP** infill panels. They were responsible for the preparation (on-site assembly and transportation with the crawler excavator) and the fastening of the rubber elements. Given the smooth flow of the installation, the hassle-free cooperation of all persons involved and the excellent preparation, 50 rubber panels could be installed in 3 days.



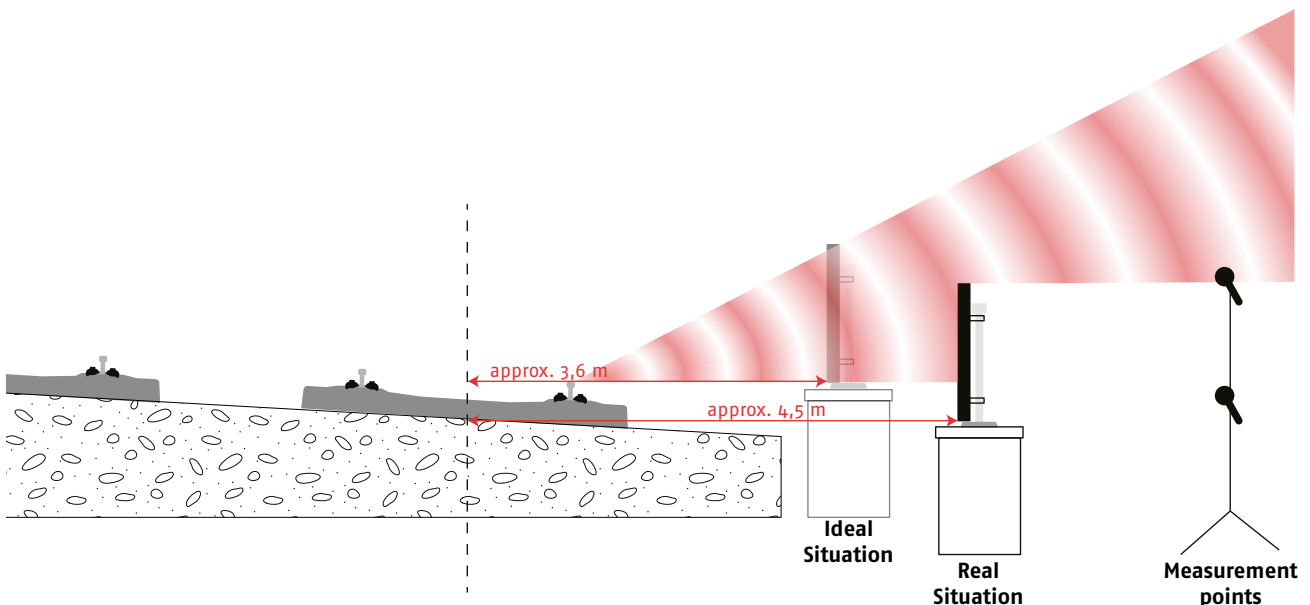
## # 3 / SOUND MEASUREMENTS

Before and after the installation, sound measurements were carried out by the engineering company Möhler+Partner Ingenieure AG. By comparing the „before“ and „after“ measurements, the effect of the infill panels was assessed in this case.

However, the geometric conditions were not optimal for measuring sound. The use of the infill panels is generally intended for a height of 1.3 m above the top of rail (TOR) and a standard distance of approx. 3.6 m from the track axle. At this test section, however, the height above TOR was 0.70 m – 0.85 m at a 4.5 m distance to the track axle of the nearest track. Among other things, the effect depends on the height above TOR and the short distance to the track axle. The fact that the intended height of the infill panels above TOR (1.3 m) could not be reached affected the result of the sound measurements negatively.

Despite the geometric conditions (height and distance), the evaluation of the effect of the infill panels showed a level reduction of 5 – 7 dB(A) at TOR level for pass-byes at the near track.

Consequently, it can be assumed that under optimal conditions a higher level reduction can be achieved.



## # 4 / SUMMARY

Already during the on-going installation of the railing and the infill panels there was positive feedback by immediate residents and pedestrians. The infill panel system does not represent a visual impairment for the residents and causes a significant noise and sound reduction which is clearly perceptible. Also the Deutsche Bahn have already signalled their satisfaction with the implementation of this project and its effect. The „Bürgerinitiative im Mittelrheintal gegen Umweltschäden durch die Bahn“ (Citizens' Initiative in Middle Rhine Valley against Environmental Damage Caused by Railways) have been very pleased with this pioneering and future-oriented sound protection project in Rhine Valley.

In conclusion, the smooth flow of the planning, organisation and implementation were remarkable. All persons involved put a lot of energy into the project and its success. The positive feedback of the population and the Deutsche Bahn make this success especially pleasant. The sound reduction according to the measurement results and the prognosis of the simulation confirm the effect of this product.