



Transparent noise protection for the new A 281 highway

In Bremen a new highway, the A 281, is being planned and constructed, partly right through the city, to complete the highway ring road around the city. In addition to the complex technical requirements, engineers and construction companies are also having to take into account extensive urban requirements and a wide range of environmental issues. Two sections were opened to traffic in January 2008, with the entire highway ring road scheduled to be completed by the end of 2013. The construction of the highway in an urban area is an enormous challenge in terms of planning and realisation, requiring many technical issues, in particular the concerns of adjacent residents and environmental and conservation considerations, to be adequately addressed.

The whole of the A 281 is located within the urban area of Bremen, and traffic noise and exhaust emissions from the city's main thoroughfares has long been a problem for the adjacent residential quarters. For this reason new active noise control measures are planned along the entire length of the new highway sections. These, combined with the reduction in noise on roads that will be relieved by the A 281, will lead to a significant overall reduction in road-related ambient noise in the currently heavily polluted adja-

cent residential areas. Aesthetics and architecture have also been assigned considerable importance during planning and construction.

More than 80 buildings are located along the new 5.7 kilometre highway stretch, which has been lined with 6.6 kilometres of noise barriers. Both the elevated highway over the former wholesale market with its Y-columns, and the elevated highway between Richard-Dunkel-Straße and Georg-Wulf-Straße allow constant visual connections between the area north and south of the highway route thanks to the wide column positions and the transparent noise barriers along an area measuring 2.3 km with a wall height of 2.00 m to 3.80 m. As a manufacturer and system supplier for noise and environmental management, Gaggenau-based R. Kohlhauer GmbH supplied the "Plexiglas Soundstop GS CC" acrylic glass panes for this construction project, which are part of its range of innovative road and rail solutions. Companies in Germany and Europe are opting for the flexible and efficient Kohlhauer System because it allows optimal transparency combined with the highest-possible noise protection. Kohlhauer is also the only manufacturer to offer absorption values of 4 dB and upwards with its "Clear-wall HS" system.

In Bremen the decision was taken to install a structure that incorporated Soundstop GS CC 20 plexiglass elements. The transparent material with an integrated nylon thread optimally combines impact strength and UV resistance, and is one of the south German company's high-tech products. It is primarily used for exposed areas as defined in the ZTV-LSW. The contract for the static calculation of the 2.3 kilometres-long transparent noise-reduced section, execution of the workshop plans, and installation was awarded to INCON GmbH from Höhn/West-erwald. For more than 30 years INCON has worked as a technical service provider for

innovative structures in the areas of noise-reduction and steel construction. The company, originally a team containing specialist engineers and industrial and plant assembly workers, is now an authority for complex planning, project development, construction, technical drawings, assembly and even maintenance and repair.

The system is easy and quick to assemble. During assembly, steel posts are attached to the rim beam. The plexiglass element is then clamped and securely held between the steel posts by clamping brackets. Maximum safety at the sound barrier is ensured by means of integrated crash protection. The company offers a 10-year guarantee on the extremely weather- and age-resistant material used for the barriers. Moreover, it is 100%-recyclable. For soundproof mounting onto bases and rim beams, R. Kohlhauer offers tested accessories, such as tested steel ropes and EPDM seals, plus a whole host of other accessories, including borders and aluminium frames

With its transparent, noise reduction systems, the south German noise-reduction specialist offers architects manifold design possibilities. Variable patterns and colours are used to protect birds, while a permanent two-sided graffiti system protects the surfaces from unwanted graffiti, reducing maintenance costs to a minimum.

Conclusion: While conventional sound-absorbing walls cast shadows and drop shadows onto the roadway, use of this transparent sound-absorbing wall results in a constant light situation and hence increased safety. All road users have an open view of the surrounding landscape, thereby effectively avoiding the tunnel effect, a cause of tiredness.

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