

Noise Barriers - the unwanted interim solution for the future?

You know the situation – you are driving around and then you notice them - the noise barriers – to the left and right of the road; and if you are travelling by train ... the same picture. They isolate us, separating us from the environment whilst their function is highly questionable. Especially for the residents. It gets worse though over time ... they have become dirty, covered with graffiti, not even properly fulfilling their function.

Yet many investors do not see acoustic protection as an environmental issue, but only as compliance with legal directives and an additional cost factor. So what happened? What can be done to obtain acoustic protection more effectively, more functionality and give it more aesthetic value?

Acoustic protection is a particularly subjective, even emotional subject. Noise is always perceived and a noise barrier raises the hopes of those subject to that noise that it will be eliminated completely... that peace and quiet will return. As such noise barriers give something of a false image in the market; hence misunderstandings occur leading to disappointment all round.

Owing to the fact that decision makers only see noise barriers as an additional cost item, from day one the planning phase begins from a poor perspective, leaving little room for creativity and design. Low-cost standard solutions are the designs which characterize our landscape nowadays. Such as concrete and aluminum walls; yet wood and transparent materials represent today's solutions.

Individual noise barrier projects in Europe though have suggested that noise barriers do provide the opportunity to be integrated into the environment and the potential to reflect current architectural trends. Recent projects have even indicated that competition amongst cities for prestigious awards will use noise barriers at crucial entrance points to give the best possible first impression – as if it was their business-card.



Therefore noise barriers must be the subject of interdisciplinary planning right from the beginning. Acoustic specialists, architects, steel workers, manufacturers of noise barrier elements, contractors and installation companies must all work in co-operation.

A dialogue between political decision makers, architects, contractors and end users at an early stage helps to develop the best solution in such cases. Globally, emerging markets for noise barriers, lacking experience in this field, need to be brought up to speed.

Acoustic protection must not exist simply in order to promote local party politics, or to get votes around election time. Rather, it should be perceived as a suitable environmental method of protecting people from noise.

To put the subject in context it is important to demonstrate to residents affected that noise barriers will not create silence. A noise barrier's function is to reduce noise to a level which is no longer a danger to health. This is fundamental. According to the World Health Organization, 300,000 people die each year as an indirect result of noise. This in itself is a good enough reason to install noise barriers when and where needed.

However what makes a good noise barrier? And why? And what is the investment?

First of all, a noise barrier must be placed where there is noise. Acoustic protection must be planned by acoustic specialists who take the environment into consideration and analyze the characteristics of the noise. Many noise barriers are too low, too short or too far away from the source of the noise. Or built



dings, hills or valleys in the area are not considered, so that noise is reflected, potentially causing noise problems elsewhere.

“Reflection” and “absorption” are the words which architects should bear in mind as the basics of acoustic protection. The material properties of the different acoustic protection elements must be understood by the architect, so that they can be **appropriately integrated into the design.**



Designs must be structured not just for road users. It is a paradox that those who cause the noise are also provided with the more attractive side of the noise barrier. The budget is usually limited to such an extent that there is no more money for a good design on the reverse side. Thus, the driver rushes past the noise barrier in a few seconds, in contrast to the resident who has to suffer the same unattractive view for decades.

Many new possibilities and material combinations are not used by the architect due to lack of knowledge, so that the project as a whole is again reduced to questions of cost and functionality. Also, the quality standard and the durability of a noise barrier are not fully exploited.

The noise barrier of today is multi-functional.

Acoustic protection is regarded as a construction item by the building industry. Therefore noise barriers are included in the main contractor's budget. It represents a very small part of a large motorway or bridge project total cost. Since noise barriers are constructed as one of the last components in the entire project, this package of works is expected to be subject to pressure from cost overruns generally.

Central, regional or municipal government funding fluctuations of the project add to this pressure. Material savings or more simple designs are potential solutions to the problem, as long as they meet with the terms of the relevant legal directives. „Warranties and guarantees still have to be kept to but there is no room to exceed these. Nevertheless, it is just a matter of time before this approach fails.“

Last year, 500 million Euros was invested - spent - on noise barriers - in Europe alone and this amount should be seen as conservative.

Based on experience, it is not unrealistic to say that 20% of these will be damaged after approximately 5 years. Consequently EUR 100 million will need to be spent on noise barrier replacements and maintenance each year, and this is just in Europe.

Contractual demands for guarantees of 60 years for noise barriers are misplaced. If noise barriers are still required in 60 years time, then we have to conclude that the environmental protection initiative originally intended has failed. Noise can be best prevented if it does not arise at all.

The obvious conclusion is that “Noise polluters” need to provide solutions in the very short-term.

Automotive and tyre manufacturers and producers of pavements should participate in this; so too legal authorities in regard to general speed limits. The range of participants in the process is extensive.

Therefore, noise barriers should only be regarded as an interim solution, and even here it is time to rethink matters. Acoustic protection needs new approaches - multi-functional approaches.

Noise barriers are active environmental protection and should be treated as such.

They should be considered distinct in their own

right, separate from construction. They have great potential and can perform much more than simply protecting against noise.

Hence, the time to act is now in reframing existing concepts. It is time to implement new solutions in the market.

Innovative designs, such as, for instance, noise barriers that are both transparent and absorbent, despite appearances to the contrary, will increase acoustic performance, conform to sustainability agendas, set new trends and grow the market generally.

New designs, such as the Point Fixing Support, can be realized by the integration of acoustic protection and steel construction elements.

Green noise barriers – vertical vegetation structures – such as **the PLANTA® system, can perform nature-orientated functions in urban areas**, whilst still acting as acoustic protection. This system incorporates planting, acoustic protection, air filtering, evaporative cooling and discourages graffiti and vandalism.



New technologies, like photovoltaics, are already successfully integrated into acoustic protection modules today as can be seen in the Kohlhauser **VOLTA® system**.



These are new solutions which will stimulate the development of acoustic protection. They are both innovative and non-polluting. Acoustic protection will integrate further functions, as the market develops, into one unit.

New modules are already in the planning stage... modules which are at a reasonable price level, have a long lifespan and which provide a balance between criteria of materials usage, resources and demand for energy.

Today, companies such as R. Kohlhauser GmbH in Germany are intensively involved in the application of innovative, integrated approaches on a global basis, where they are investing in new technologies and new services. Future opportunities are best solved by a system-based culture.

Long gone is the time when individual acoustic protection elements could be purchased and installed as an afterthought.

Modern day noise barriers are increasingly becoming **high-tech function walls**. Noise, solar energy and landscape engineering are trends which are coming into focus more and more. Only the integration of different industries' solutions can cover these requirements by performance of "design-and-build".



At the same time, the global approach is becoming more and more significant. Noise occurs mainly in large **urban areas, particularly in Asia**. Acoustic and environmental concepts can be best solved in co-operation with the top 10 largest cities in the world for instance.



Medium-sized private companies, with their limited, local approach, will not be able to handle acoustic problem-solving of the future. Harmonization of markets, accepted standards, safety and environmental legislation when combined with the demands of using different technologies as one to fulfill demanding financial / economic requirements requires the commitment of organizations with a "one-world" reach, attitude and expertise.

Noise barriers today are not only an interim solution, but rather the beginning of a new generation of sustainable and multi-functional elements in the environmental protection sector, providing much more than just acoustic insulation.

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R. Kohlhauer GmbH

Guido Wolf
Vice President

Author's Short Profile:

Dipl.-Ing. Guido Wolf studied plastics engineering in Germany. He worked in the past in sales and marketing for General Electric Plastics & Corus Steel amongst others in various countries in North America, Europe and Asia. Guido Wolf has leading, international experience in the plastics, steel and automotive industries and works as Vice President for R. Kohlhauser GmbH. in Germany, working intensively and extensively in the international noise barrier market.

Point Fixing Support



large urban areas



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