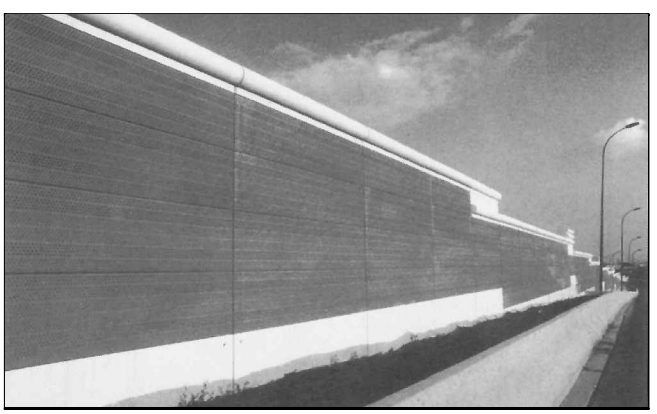
Roadside Noise Reduction – the French Approach

The KIOSK agency of Grenoble is developing expertise enabling it to offer screening that is transparent or profiled like aircraft wings, which play on the light and avoid creating a visual obstacle for the neighbouring dwellings.

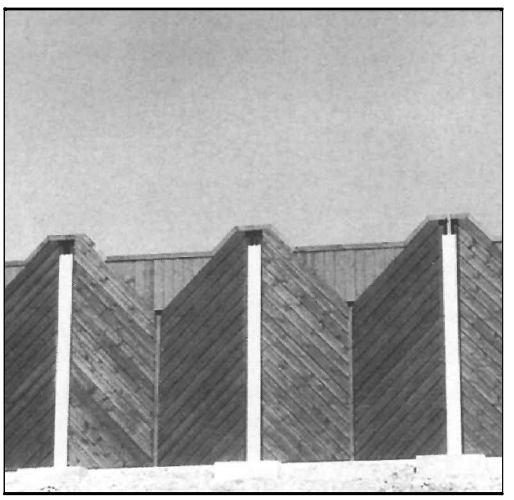
France may have been slow to introduce effective anti-noise legislation, but nevertheless there is a timescale for the reduction of noise. A law in 1992 set a 10 year deadline for reducing noise where neighbouring road noise levels exceeded 66 dB. Conscious of the potential market, French companies in the building and the public works industry have developed a number of noise-reduction solutions that combine good visual appearance and effective performance.

Materials used by French road-noise screen manufacturers range from concrete to expanded metal and glass. Guiraud Freres is the only manufacturer in the world offering large dimension self-supporting clay bricks (2.60m long, 0.6m wide and 0.2m thick). Placed horizontally or vertically, they have a perforated facing and incorporate a mat of absorbent mineral wool.



Noise screens made by Guiraud Fréres of Toulouse

Increased awareness of environmental issues has led to the use of wood in anti-noise screening. To further improve its resistance to the weather and chemical attack, Intrabois is using treated wood. The treatment, which is carried out in large-scale batches, enables the wood to withstand the most hostile environments while retaining its advantages (attractive appearance, ease of construction, etc.)



Intrabois' wooden noise–absorbing road screens

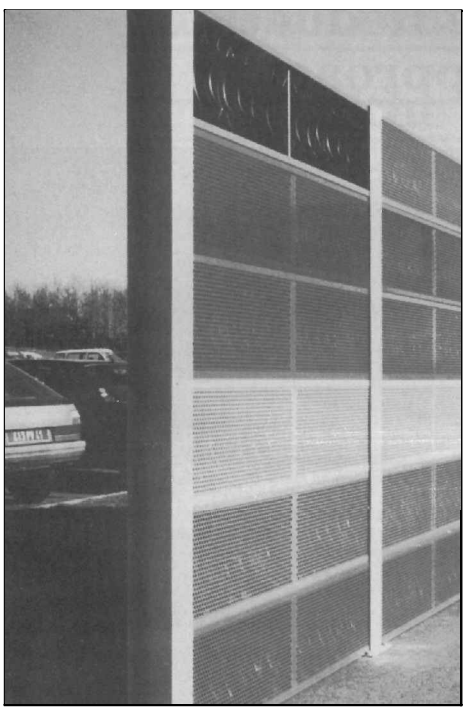
Even more environmentally friendly is the technique developed and patented by Acial, used tyres are cut in half, and positioned in modular perforated steel enclosures. This screen provides a high level of sound absorption and offers an original solution to the problem of recycling mountains of used tyres.

The KIOSK agency of Grenoble is developing expertise enabling it to offer screening that is transparent or profiled like aircraft wings, which play on the light and avoid creating a visual obstacle for the neighbouring dwellings. Whatever material is used, the acoustic efficiency of anti-noise screening depends on three factors:

- It must be sufficiently heavy to reduce direct sound transmission: a minimum surface density of 30 kg/m^2 for a minimum transmission loss index of 30 dB(A) measured in the laboratory;
- It must be located close to the noise source, over lap the area to be

protected by at least 150 metres on each side, and be sufficiently high (2 to 10 m depending on the site and the traffic) to reduce the intensity of diffracted waves (the sound, particularly at the low frequencies predominant in road noise, can pass around obstacles);

- It must not reflect the incident sound energy onto dwellings that may be opposite: reflective screening should, in this case, always be tilted by about 10 degrees towards the bordering land (to reflect the sound upwards). Absorbent screening on the other hand should be vertical.



Noise screens from Acial are environment–friendly – they use recycled tyres

It should not be forgotten that, in the best cases, the final reduction achieved is not more than 10 dB(A), which is equivalent to a noise reduction of one half. This result assumes a high level of technical expertise at all stages (manufacture, analysis, design, installation, etc.).

The design of acoustic screening is now performed using computer modelling tools that take into account the effects of propagation depending on the weather (wind and temperature) and the type of soil (absorbing or reflecting). The company 01 dB, specialists in digital acoustics, is distributing Mithra software, developed from 1987 under license from the CSTB (Building Science and Technology Centre) in Grenoble. This tool makes it possible to evaluate, using simulation, the acoustical effects of a planned road or railway and to optimise the design of noise reduction measures, such as canopies or screening.

After modelling the site it is possible to classify the acoustic exposure of building facades and to define the constraints faced when insulating the barriers. Simple "in the field" measurement is not always sufficient to take account of the complexity of an existing noise situation, or its predicted changes over time. The computer input of data for the site therefore includes all the relevant parameters, such as the topography, the type of soil and roadways, types of buildings, etc.

The results are shown in the form of charts or noise maps superimposed on the architect's plans. They detail in particular the neighbouring noise levels, with and without acoustic screening. These studies therefore enable the optimal application of precisely designed (and therefore more cost effective) engineering solutions.

For more Information

CAMPAGNA ET IND Montee de Malissol 38200 VIENNE France.
Tel: + 0033 (0)474 572410

CSTB GRENOBLE 24, rue Joseph Fourier 38400 ST MARTIN D'HERES France.
Tel: + 0033 (0)47676 2525

GUIRAUD FRERES 114, Bd de l'embouchure BP 2139 31018

TOULOUSE CEDEX France.
Tel: + 0033(0)561 265400

INTRABOIS Rue des Freres Limiere BP 27 42161

ANDREZIEUX–BOUTHEON France.
Tel: + 0033(0)477 365506

NOT FUNNY, SAR'NT-MAJOR

Loud orders barked out by sergeant-majors may be damaging soldiers' hearing, the Ministry of Defence fears. It is also concerned that the noise levels of military bands are harmful and has set up a working party to find out. The ministry is worried that it is breaking health and safety legislation, leaving itself open to law suits by servicemen. The ministry's directorate of safety, environment and fire policy says that an audit to examine the Armed Forces' compliance with the 1989 noise at work regulations identified a number of serious shortcomings. "These are: infantry operational training situations, where it is essential for soldiers to hear orders or the sound made by any potential adversary; and military bands, especially the percussion and brass sections." John Spellar, the Armed Forces minister, confirmed that a team of scientists, academics and civil musicians was examining ways of ensuring that the MoD was not contravening noise pollution regulations. "Industrial deafness in any job is not a joke," he said. "If there are commonsense solutions, we will take them up and if there is not, we won't." He denied that attempts to comply with health and safety regulations would ever be allowed to compromise the forces' ability to fight. Paul Ketch, the Liberal Democrat defence spokesman, said: "Setting up a working party on the loudness of a sergeantmajor's voice is barmy."

GROWTH FIGURES FOR NEW YORK

New York City has a 'quality of life' hotline, which is manned by the Police Department and which is there to record and, if necessary, investigate complaints from citizens. In the year 2000, between January 1st and September 11, the hotline received 38,167 complaints of which 87% were noise-related. In the same period in 1999, the line received 18015 complaints, of which 77% were noise-related.