

Noise levels at shooting range

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“Environmental noise pollution relates to ambient sound levels beyond the comfort levels as caused by traffic, construction, industrial as well as some recreational activities. It can aggravate serious direct as well as indirect health effects, for example damage to hearing or causes stress” (CCOHS, Stephen A. Stansfeld & Mark P. Matheson).

Noise can be continuous, variable, intermittent or impulsive, depending on how it changes over time. Continuous noise is noise that remains constant and stable over a given time period.

There is some evidence that the hazards from impulse noise are more severe than that from other types of noise (Dunn et al. 1991; Thiery and Meyer-Bisch 1988).

There is noise perception: a change of three decibels is noticeable, five is clearly noticeable and 10 is perceived as twice as loud (BS 8233:1999 Environmental Noise).

Shooting range noise comprises two different components: the firing noise, or muzzle blast, and the bullet’s flight noise, or supersonic boom. They usually occur so close in time to each other that they cannot be told apart by listening or in regular measurements.

Impulsive noise emanating from firearms on the shooting ranges varies from 120 to 160 dB(c.)

The assessment, measurement and calculation of noise are not, strictly speaking, best available techniques but they are necessary for determining and dimensioning the techniques (BS EN ISO 17201).

The results have a rather large effect on the dimensioning of the noise abatement need and also on the scope and costs of the measures.

With regard to noise, the location of the shooting range should be selected so that the distance to the exposed sites is as large as possible.

The location of residential buildings, holiday homes and healthcare and educational institutes in the surroundings of the planned siting of the range must be determined to a distance of 3.5 kilometres.

The orientation of the range can affect the location of the noise area because the noise radiates most effectively in the direction of firing.

The firing stands enclosure at a shooting range usually significantly attenuates the noise propagating to the sides and the rear sector, compared to a situation without the enclosure. If the enclosure is a sturdy structure, closed from the sides and the rear, the noise propagating directly through the walls will be attenuated by around 15 - 20 dB.

“Noise control measures resulting in an abatement of over 15 dB are very massive and expensive”

For noise abatement in the direction of firing, a noise berm or a combination of a noise berm and screen would be suitable, as would also noise screens or berms in the side and rear directions.

Furthermore, a firing line enclosure can be used for noise abatement at trap ranges. However, at skeet ranges, an enclosure cannot be used.

The firing directions at the different stands may also be clearly different from each other, meaning that the noise propagation areas can also be clearly different. One can therefore influence noise propagation by planning the positioning of the firing stands.

A noise-reducing firing enclosure can only be used for the firing stand of a trap range, in which case the side and rear walls of the enclosure are solid structures. At a range that is in competition use, the rear wall of the enclosure must be sufficiently transparent to enable the judges to have a visual contact with the shooters. An attenuation of around 10 dB can be achieved in the rear sector with a transparent enclosure with a lot of windows.

As a rule, only noise barriers, or screens, berms, and their combinations, are suitable for the prevention of noise propagation at shotgun ranges.

Noise screens are not usually used in the front direction.

With regard to coniferous trees, spruce is clearly more effective than pine. Woods provide 0 - 4 dB of attenuation, optimally even slightly more.

Noise control measures resulting in an abatement of over 15 dB are very massive and expensive.

The need for such extensive measures is usually an indication of the shooting range being in an unsuitable location. Therefore, it is reasonable to conclude that the resetting of a shooting range is to the benefit of all concerned.

Barrier range	Shooting	Barrier height/length	Price €
Side berm	Rifle, prone	3.5m/150m	50,000
Side barrier	Rifle, prone	3.5m/150m	90,000
Backstop berm	Prone, rifle	13m/20m	40,000
Backstop berm	Standing, pistol	4m/20m	20,000
Backstop berm	Standing, shotgun	12.5m/250m	500,000
A-weighted sound energy level			dB(c)
Rifles			138
Shotguns			136/160
Pistols			130
.22LR rifles			120
.22 calibre pistols			120

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