

Side diffraction

SP Net info 8

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In general the screening effect of a noise barrier or a building depends mainly on the transmission in the vertical plane above the object. However, under certain conditions it might be necessary to consider the side diffraction, meaning the transmission around the ends of the obstacle in a plane through source and receiver. This is relevant if the source is a (stationary) point source and the line between source and receiver intersects the obstacle near the horizontal boundary of the object. For moving point sources and line or area sources it is rarely necessary to deal with this transmission and some standards like RTN96 simply discards it. GPM and NMT96 takes side diffraction into account; however, speaking in terms of calculation time it can be costly to include side diffraction and since it often has only insignificant effect on the result, it is possible to disable it. This is done on the index card Diffraction in the settings of the standard. In a final calculation side diffraction should always be included, at least if you are dealing with point sources.

According to most standards – including the Nordic standards (GPM, RTN96, NMT96) – only objects intersecting the direct line from source to receiver is evaluated for screening (and reflection). In a situation like the one shown on Fig 1 only Screen 1 will produce screening, even if Screen 2 in real life has some effect on the level at the receiver, especially at low frequencies. Consequently, the total screening of the two barriers is underestimated in that very receiver point. On the grid noise map Fig 2 the passage between the two screens causes a local increase of the noise level. SoundPLAN will exaggerate this increase.

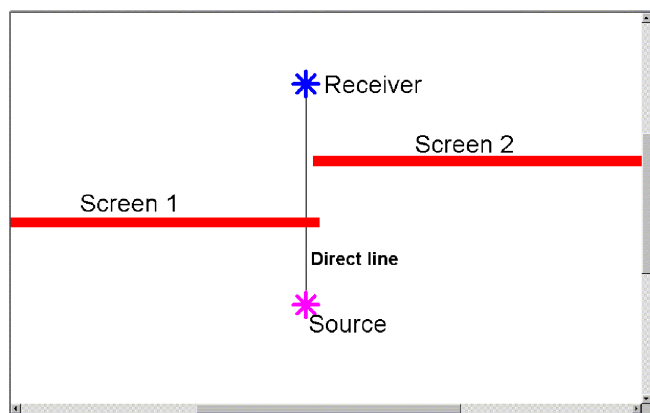


Fig 1 Only Screen 1 is evaluated for screening

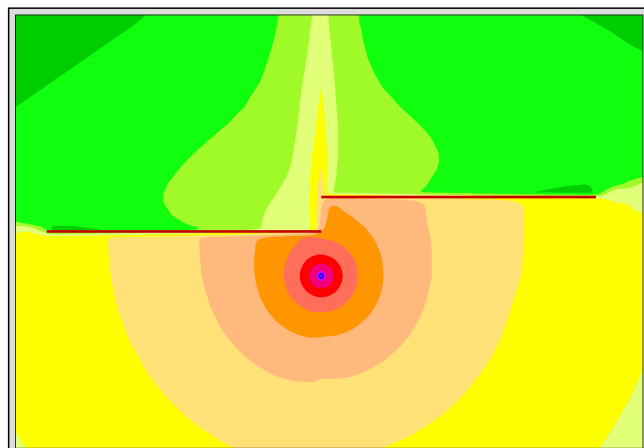


Fig 2 Transmission through the passage is exaggerated

Connected objects – like the main building and the annex in Fig 3 – are from version 7.1 evaluated for side screening as a single unit, meaning that even if the line between source and receiver does not intersect with the annex, this building will be taken into consideration when calculating the side screening.

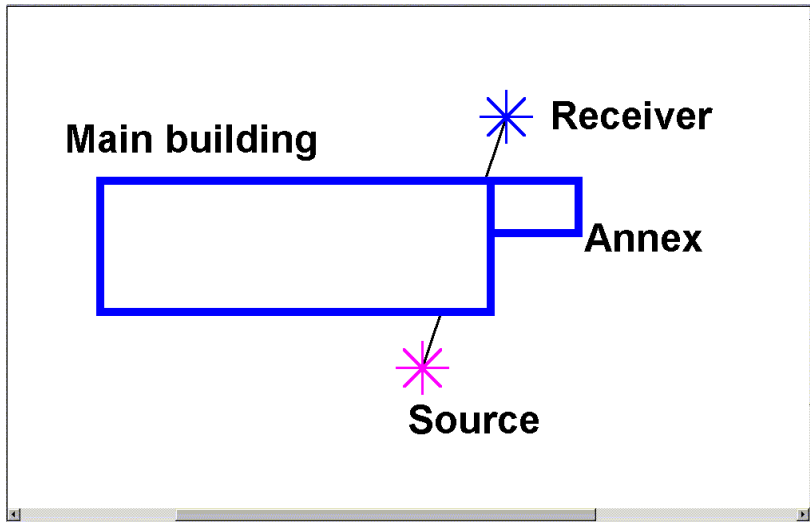


Fig 3 *Connected buildings*