



Sound Insulation Program

Glossary of Acoustical Terminology

Acoustical Treatment – The application of design principles in architectural acoustics to reduce noise or vibration and to correct acoustical faults in spaces.

Acoustics – The science of sound, including the generation, transmission, and effects of sound waves, both audible and inaudible.

Ambient Noise – Background noise from all sources unrelated to a particular sound that is the object of interest. Background noise may include airborne, structure borne, and instrument noise.

Artificial Noise – Noise with a continuous frequency spectrum and with equal power per constant percentage bandwidth. For example, equal power in any one-third octave band.

Avigation Easement – In consideration of receiving sound insulation modifications to their residence, Homeowner(s) must sign an Avigation Easement which grants KCIA the right of flight over/near their residence. An Avigation Easement is perpetual in nature and shall bind and attach to the title of the property for the benefit of King County or its successor interest as owner and operator of the Airport.

Change Order – Any change from the agreed-upon, original Scope of Work for the Homeowner's project that requires mutual agreement by KCIA and the Homeowner.

Day-Night Average Sound Level (DNL or L_{dn}) – The day-night average sound level is a measure of the annual average noise environment over a 24-hour day. It is the 24-hour energy-averaged A-weighted sound level with a 10 dB penalty applied to the nighttime levels which occur between 10:00 p.m. to 7:00 a.m.

Decibel (dB) – Sound energy is measured in units called decibels that are commonly abbreviated as "dB." The decibel scale does not increase or decrease using standard arithmetic because decibels are logarithmic. For example, a noise level of 65 dB has half as much sound energy as a noise measuring 68 dB.

Design Criteria – Design goals used in acoustical and noise control design of buildings. Design criteria are usually stated as maximum allowable noise levels permitted inside buildings or as noise reduction values required for certain types of buildings or room occupancies.

Eligibility – A home is eligible for participation in the Sound Insulation Program if it is located within the Noise Mitigation Boundary, as defined by KCIA and approved by FAA in June 2005; and is a legally permitted single-family home or a multi-family dwelling of no more than four units constructed prior to October 1, 1998; and is not a mobile home.

FAR Part 150 Noise Compatibility Study – A voluntary program that allows an airport to work with local communities (Homeowners and elected officials), airlines, FAA, and other interested parties, to determine reasonable solutions to the impact of aircraft noise on neighborhoods surrounding the airport.

FAA – Federal Aviation Administration is an agency of the U.S. Department of Transportation and responsible for 90-95% funding for KCIA's Sound Insulation Program.

Frequency – The number of oscillations per second completed by a vibrating object. Measures the rate of vibration of sound. High frequencies have a high pitch, like a whistle, while low frequency sounds are more like the rumble of a truck or airplane. Frequency is abbreviated as cycles per second, or "hertz."

Habitable – A livable area that is occupied year-round and meets all code and building construction requirements with respect to mechanical and electrical systems, foundation, wall, ceiling and roof materials and structure.

Homeowner's Satisfaction Questionnaire – A brief survey for Homeowners to complete and submit to KCIA that briefly describes their comments and feelings about the level of noise in their homes after completion of the sound insulation modifications.

KCIA – King County International Airport is a division of King County's Department of Transportation and responsible for matching 5-10% of FAA's grant funds for the Sound Insulation Program.

Mitigation – See definition for Sound Insulation.

Noise – Any sound which is undesirable because it interferes with speech and hearing, or is intense enough to damage hearing, or is otherwise annoying.

Noise Compatibility Program (NCP) – The recommendations included in KCIA's Part 150 Land Use Compatibility Study, which were approved by the King County Executive, the King County Council, and also by FAA in June 2005, constitute KCIA's Noise Compatibility Program. KCIA's NCP included recommendations for a Fly Quiet Program and new flight procedures, some land-use policy studies, as well as school and home insulation programs.

Noise Contours – Continuous lines of equal noise level usually drawn around a noise source. The lines are generally drawn in 5-decibel increments so that they resemble elevation contours found in topographic maps except that they represent contours of equal noise level. Noise contours are generally used in depicting the noise exposure around airports, highways, and industrial plants.

Noise Mitigation Boundary Map – This map shows the DNL noise contours which are used to determine eligibility for the Sound Insulation Program.

Noise Level Reduction (NLR) – The design objective in a residential noise insulation project generally should be to achieve the requisite NLR when the project is completed. (This is mathematically equivalent to achieving a DNL of 45 dB in all habitable rooms.) Since it takes an improvement of at least 5 dB in NLR to be perceptible to the average person, any residential noise insulation project should be designed to provide at least that increase in NLR as a marginal minimum. (*FAA Order 5100.38C, Section 812 b. (2)*).

Noise Test – KCIA selected Wyle Laboratory’s noise testing method for residences within eligible noise contours in order to limit noise to the least intrusive method possible. To prevent public nuisance and provide accurate noise reduction measurements in a timely manner, Wyle developed an artificial noise procedure placing the noise generating source inside the home. Wyle refers to this method of noise testing as “inside-outside.”

Notice to Proceed – A formal document and/or point in the Homeowner’s process where KCIA notifies the construction contractor that it is authorized to commence construction work in accordance with the Scope of Work and provisions of the Sound Insulation Contract.

Power of Attorney – If a representative or agent is to act on a Homeowner’s behalf with regards to the Program, the Power of Attorney form must be executed and submitted designating the representative or agent.

Punch List – A “to do” list made near the completion of construction work indicating the items that remain unfinished, or that do not meet the quality requirements specified in the Sound Insulation Contract. The Punch List must be satisfied prior to 100% completion.

Shielding – The sound level reduction experienced at different elevations of a building in relationship to the source of aircraft noise of a flight pattern.

Sound Insulation – Reducing the sound level inside a building through the installation of specific building construction materials, and component assemblies which provide increased noise reduction characteristics.

Sound Source – The object which generates the sound.

Source Room – In architectural acoustical measurements, the room that contains the noise source or sources.

STC Rating – STC represents Sound Transmission Class. This is the standard method of rating sound insulation qualities in building products. A higher STC rating means better noise reduction. For example, brand new thermo-pane windows typically provide an STC of 28-32. KCIA designs require acoustical windows with a minimum STC rating of 40.

Thermal Insulation – An assembly of materials used primarily to provide resistance to heat flow but not necessarily noise.