812. NOISE INSULATION PROJECTS.

a. Regulatory Background.

The Aviation Safety and Noise Abatement Act of 1979 (ASNA) directed FAA to identify land uses that are normally compatible with various noise exposure levels.

In response, FAA adopted the 14 Code of Federal Regulations Part 150, Airport Noise Compatibility Planning (14 CFR Part 150.) The adoption of the regulation was published in the Federal Register Notice 46 FR 8316 on page 69, on January 26, 1981.

14 CFR Part 150 under 49 US Code serves as the guidance for much of the AIP-funded noise compatibility program. 14 CFR Part 150 includes "Table 1 - Land Use Compatibility With Yearly Day-Night Average (DNL) Sound Levels" that defines compatible and noncompatible land uses and related structures.

b. General Requirements for AIP funding of Noise Insulation Projects

1. Only a noise-impacted noncompatible structure that is in the DNL 65 dB contour *and* the existing interior noise levels are 45 dB or greater with the windows closed can be included.

A noise-impacted noncompatible structure - typically a residence, place of worship, school, or hospital – must be both in the DNL 65 dB contour and be experiencing existing interior noise levels that are 45 dB or greater with the windows closed. (For schools, the 45 dB measurement may be based on the number of hours of the school day.) 46 Federal Register, page 8316, January 26, 1981, establishing the interim rule for Part 150 included the interior noise level. This was further clarified in 1992 by the Federal Interagency Committee on Noise (FICON) findings of 45 dB to be the interior noise level that will accommodate indoor conversations or sleep.[1] The 45 dB standard has been adopted by FAA for interior noise.

There are three ways that a structure can be considered for noise insulation.

A. The structure is located within a currently valid existing or forecast day/night average sound level (DNL)[2] 65 decibel (dB) or higher contour associated with operations at an airport on the FAA-accepted Noise Exposure Map (NEM)[3] and is in an approved program measure[4]. The

[1] Table 3.4 and Section 3.2.3 of the 1992 FICON report states that the indoor noise level of DNL 45 dB is identified as the protective level to protect speech interference.
[2] The FAA recognizes CNEL (community noise exposure level) as an alternative noise metric for California. For purposes of this guidance the metric DNL and CNEL can be used interchangeably.
[3] 14 CFR Part 150 section 150.21
[4] Per 49 USC 47504(c)

NEM is normally developed by an airport sponsor as part of a Part 150 study.

B. The structure is included in a noise mitigation program prepared by a State or local jurisdiction surrounding a medium or large hub airport that either has not prepared a 14 CFR Part 150 program or does not have an updated 14 CFR Part 150 program[5]; or

C. The structure is an adversely affected school or hospital. Under 49 United States Code §47504, an adversely affected school or a hospital may also be eligible; whether or not it is part of an airport sponsor's NCP.

Under 14 CFR Part 150, the FAA adopted the standard of DNL 65 dB, as the Federal land use compatibility guideline at which residential land uses are considered non-compatible with airport noise.

2. A lower local standard (e.g., DNL 60 dB) may be used for Part 150 purposes if the standard is formally adopted by the local jurisdiction for land-use compatibility and the airport sponsor has incorporated it[6] (although the interior noise level standard of 45 dB does not change). Where a lower local noise standard is adopted outside of the Part 150 process, 49 USC 47141 requires that the land use compatibility plan be developed cooperatively by the airport sponsor and local jurisdiction to be eligible for a grant. Additional information on these requirements is addressed in Paragraph 810.b. **Noise Exposure Maps used for Noise Insulation Programs must be Current.**

Noise contours change for many reasons, such as changes to aviation activity and changes to air traffic procedures. By law, FAA must rely on only those noise exposure maps that reflect current or reasonably projected conditions[7]. In 2005, FAA published Program Guidance Letter 05-04[8] which addressed the requirement for currently valid noise contours. In general, NEM's less than 5 years old are considered current, unless conditions have created a significant change that would affect noise contours.

NEM older than 5 years old must be certified by the sponsor and updated as required as discussed in the PGL.

The ADO must verify that the NEM showing the DNL 65 dB contour reflects the current or projected operational conditions at the airport and associated

[5] Codified in 49 USC 47141.
[6] 14 CFR Part 150, Table 1 in Appendix A.
[7] 49 USC 47503
[8] Program Guidance Letter 05-04, About §§189, 322, and 324 in Vision 100-Century of Aviation Reauthorization Act: Guidance For Funding Mitigation Projects for Aircraft Noise less than 65 DNL, Public Availability of Noise Exposure Maps, and Determining Eligibility Of Airport Noise Compatibility Projects In Areas of Significantly Reduced Noise Exposure, June 3, 2005. Available online at http://www.faa.gov/airports/aip/guidance_letters/

noncompatible land uses.[9] The ADO must place a copy of the verification in the project files.

3. Only Eligible Sponsors can participate in Noise Insulation Programs.

Eligible sponsors include units of local government having jurisdiction over the project location, airport sponsors, and special purpose units of local government (e.g., school districts and hospitals).

4. Acquisition of Noise Easements is not required.

Sponsors are encouraged to obtain a noise easement in return for the noise insulation provided by the project, but it is not an AIP requirement. (See Paragraph 808).

c. Specific Eligibility and Justification Requirements and Limitations for a Noise Insulation Projects.

1. Specific Eligibility and Justification Requirements for Projects.

In order for a structure to be funded with AIP grant funding, the sponsor must demonstrate that the structure meets all of the criteria listed in Table 1.

Table 1 Structure-Specific Eligibility and Justification Requirements

The following requirement …	**As described further …**
The structure must be in the 65 dB or higher contour.	The structure must be located in a noise contour as described in paragraph b-1 and be current as described in b-2.
The interior noise level must be 45 dB or greater.	The windows-closed interior noise level of the structure must be 45 dB or greater. The measurement of interior noise levels is an average for all habitable spaces in a particular residential unit, or educational spaces in a school. A structure may have interior noise levels that are already below 45 dB. This depends on the type of construction (i.e., predominant building cladding and roofing materials, type of

[9] 49 USC 47503 (b) requires submission of revised noise maps if a change in the operation of the airport would establish a substantial new noncompatible use, or would significantly reduce noise over existing noncompatible uses that is not reflected in the existing conditions map or forecast map currently on file with the FAA. The requirement for determining currency of an NEM is addressed in 14 CFR Part 150.

The following requirement …	As described further …
	thermal insulation, type of doors and windows, etc.) Structures with an interior noise level that is less than 45 dB are not eligible for noise insulation even though they may be within the DNL 65 or higher dB contour.
Interior Noise Testing is based on Windows Closed.	All testing is done with the windows closed. This requirement applies whether or not the structure has a ventilation system or not.
Noise Insulation Measures are Limited to Specific Items.	Noise insulation measures are limited to window and door replacement, ceiling insulation, caulking, weather-stripping, and central air ventilation systems if the structure does not already have a central air ventilation system. The use of other measures is not allowable unless the ADO has approved the use of the measures in advance. In this case, the ADO must keep a copy of the Sponsor's request for use of other measures and a copy of the ADO approval of the request in the project files
The structure must have been constructed before October 1, 1998.	The structure must have been built prior to October 1, 1998[10] unless the sponsor has demonstrated to the ADO that no published noise contours existed at that time[11]. New incompatible land uses created by subsequent airport development may also be eligible for funding consideration.

[10] October 1, 1998 is the date included in the publication of the FAA Final Policy on Part 150 Approval of Noise Mitigation Measures: Effect on the Use of Federal Grants for Noise Mitigation Projects, Federal Register: April 3, 1998 (Volume 63, Number 64), Rules and Regulations, Page 16409-16414 "As of October 1, 1998, the FAA will approve under 14 CFR part 150 (part 150) only remedial noise mitigation for existing noncompatible development and only preventative noise mitigation in areas of potential new noncompatible development"

[11] Per the Federal Register FR Volume 63, Number 64, Page 16409-16414.

The following requirement …	As described further …
There must be at least a 5 dB noise level reduction.	Because the design objective for using AIP funds is to provide a discernable benefit to residents, the sponsor must demonstrate that a least 5 dB[12] noise level reduction will be achieved. If for any reason the 5 dB reduction cannot be achieved, the sponsor must provide a written request to the ADO. The ADO must receive APP-1 concurrence to proceed with the work. APP-1 concurrence will generally be limited to ventilation packages and cases of neighborhood equity or for older or poorly maintained residences where the 5 dB reduction may be difficult to achieve. These special circumstances are discussed in Table 4.
All building code requirements must be met.	Sponsors must certify to the ADO that the engineering plans and specifications for the noise insulation project conform to the local building code.
All required federal contract provisions must be met.	As required by all projects funded with AIP, the noise mitigation measures must meet all federal procurement and contract requirements, including the Buy American Preference requirements of Title 49 United States Code §50101.

2. Specific Sampling and Testing Requirements for Projects.

In order for a structure to be funded with AIP grant funding, the sponsor must follow the sampling and testing criteria listed in Table 2.

[12] Handbook of Environmental Acoustics, 1994. By James P. Cowan

Table 2 Sampling and Testing Requirements

For the following…	The requirement is…
Published Guidance	In 1992, FAA adopted guidance on testing frequency, sampling and other statistical measures that can be applied to a neighborhood to estimate the interior noise levels in the residences that are in the 65 dB contour[13]. This information is compiled into the Acoustical Testing Plan. Long standing agency policy is that an airport sponsor must use the 1992 guidance to establish the existing interior noise levels to determine whether or not the building qualifies for sound insulation using AIP.
Sponsor Requirements for submitting Testing Protocol to the ADO	The Sponsor must submit the proposed testing phase protocol to the ADO. The ADO has the option to review the sampling protocol. After ADO review or after the ADO has indicated that the protocol will not be reviewed, the Sponsor will then noise insulate the residences in the testing phase.
First Step – initial testing	The first step of a noise insulation program is generally the initial testing phase. In this phase, the Sponsor characterizes the neighborhood by characterizing the housing types and locations. The Sponsor will also describe the acoustical issues, number of residences to be tested and describe the acoustical criteria and testing methodology. Example: A Sponsor is starting a sound insulation program in a community near the airport. The Sponsor first conducts a windshield survey of the types of residences that are in the current phase. The windshield survey catalogs the types of residences in the neighborhood, notes similarities and differences in the age, construction type, size, number of levels, and types of housing (single family or multi-family). Once the Sponsor has characterized the diversity of the residences in the noise contour, it will select a representative sample of each type of residence for testing, which based on industry review is typically 10 to 30 percent. Testing in this case means that the sponsor develops a sound insulation package that the sponsor believes will reduce the interior

[13] Guidelines for Sound Insulation of Residences Exposed to Aircraft Noise, Oct. 1992. This document may be found on the FAA Airport Noise web site at : http://www.faa.gov/airports/resources/advisory_circulars/index.cfm/go/document.information/documentNumber/150_5000-9A

For the following…	The requirement is…
	noise level in the residence for each type of construction. Therefore, in a neighborhood where the residences are made of either brick or wood siding, the Sponsor will develop 2 different packages – one for the brick residences and one for the siding residences. The sponsor will then measure the interior noise levels and prepares a summary report detailing the effectiveness of the design package, make recommendations for any changes to the package, lists the before and after interior noise level data, and submits the package to the ADO. Reimbursement for initial and subsequent phase testing is limited to 10% of the residences of a particular type unless the Sponsor has provided the justification for the request to the ADO and the ADO has approved the request. The ADO must approve or disapprove a Sponsor request for reimbursement for testing more than 10%, but not more than 30%, of the residences of a particular construction type. The ADO may request APP-400 assistance in evaluating Sponsor requests. A copy of the Sponsor's written request and the ADO approval or disapproval must be kept in the project file. For requests for reimbursement for more than 30% of the residences of a particular type, the ADO must receive APP-400 approval. The request to APP-400 from the ADO must contain unless the Sponsor's justification for the request, and the ADO's recommendation for approval or disapproval.
Second Step - ADO and Sponsor Review of Initial Testing Results	The Sponsor should review the results to determine if additional residences should be tested. The ADO has the option to review and approve or disapprove all Sponsor revisions to the sampling program.

For the following…	The requirement is…
Special Circumstance – Resident Requests Specific Testing	Occasionally a resident may request that their residence be tested specifically. This may be because of the condition of the home, or because the resident believes that their residence will test differently than others. These additional tests are generally allowable. However if an additional residence is tested, it must be tested both before and after any noise insulation work to ensure the 5 dB NLR is achieved.
Final Step – Completing the Testing Phase	After the completion of the testing phase, the sound insulation program will begin for the neighborhood. In these later phases, the sponsor is still expected to test from 10 to 30 percent of each different category of residences in the phase to revalidate the design assumptions. The results of the revalidation testing must be submitted by the Sponsor to the ADO. The ADO has the option to review these test reports.

3. Limitations on Eligible Projects.

Noise insulation projects are designed to reduce interior noise due to aircraft noise in habitable rooms or classroom areas. These projects are also called noise attenuation, noise mitigation, noise compatibility, sound insulation or soundproofing projects.

These projects are not intended to compensate for inadequate maintenance, to bring nonconforming structures up to building code standards, or to improve the comfort or attractiveness of a building.

Table 3 Eligibility Limitations for Specific Circumstances

For the following specific circumstance...	The requirements for eligibility or allowability of costs are…
Mechanical, Electrical, Structural and Building Code Deficiencies	If it is determined in the course of designing a sound insulation project that a building needs improvements in order to conform to local building codes, only the costs of the sound insulation are allowable. The costs of the improvements that are not related to the sound insulation are not allowable. For example, if a resident constructed unpermitted work on a residence. In order to obtain a building permit for the sound insulation project, the local

For the following specific circumstance...	The requirements for eligibility or allowability of costs are…
	building code inspectors require that the resident must install a railing around a deck. The cost of installing the deck railing is not allowable because the residence did not meet building code requirements before the sound insulation project was started.
Residential Habitable Areas	Eligible projects may include noise insulation of only the habitable areas of residences such as living, sleeping, eating or cooking areas (single family and multifamily)[14]. Bathrooms, closets, halls, vestibules, foyers, stairways, unfinished basements storage or utility spaces are not considered to be habitable. Areas that are not allowed under local building code are not considered habitable. For example, a resident has converted part of a basement to a bedroom and the bedroom conversion does not meet the building code requirements to be categorized as a bedroom. The converted bedroom is not considered habitable space.
School Classrooms and Libraries.	Eligible projects may only include noise insulation of the parts of a school that are used for educational instruction. For schools, noise insulation is limited to classrooms and libraries. Areas that are used for incidental instruction, such as hallways, gymnasiums or cafeterias are not allowable. For schools, the usual design objective for classroom environment is a time-average A-weighted sound level of 45 dB resulting from aircraft operations during normal school hours. As with residential noise insulation, a school project must reduce existing noise levels by at least 5 dB for the same time-average school hour time frame.
Structures within the DNL 75 dB and higher noise contour	The ADO should not normally consider sound insulation projects for residences, schools, hospitals, places of worship, auditoriums, and concert halls within a DNL 75 dB or greater noise contour since these uses are never compatible in these noise contours. If a sponsor requests sound insulation in the

[14] Guidelines for Sound Insulation of Residences Exposed to Aircraft Noise, Oct. 1992. This document may be found on the FAA Airport Noise web site at : http://www.faa.gov/airports/resources/advisory_circulars/index.cfm/go/document.information/documentNumber/150_5000-9A

For the following specific circumstance...	The requirements for eligibility or allowability of costs are…
	DNL 75 dB contour, the ADO may consider consulting with APP-400 for guidance. The ADO must document any determination to sound insulate within the DNL 75 dB contour, including reasons for *not* seeking APP-400 guidance must be included in the project file. Where APP-400 was coordinated with, the results of that coordination must be included in the project file.
Mobile Homes or Mobile Classrooms	Mobile homes and Mobile Classrooms are not viable noise compatibility projects since their design and construction do not lend themselves to effective noise reduction measures.
Permanent Modular Buildings.	Some modular structures may be classified as permanent if they meet construction guidelines applied to permanent structures. The ADO must make a determination whether or not to noise insulate these structures on a case-by-case basis by the ADO. The ADO must coordinate the review of the structures with APP-400. The ADO must document any determination to sound insulate permanent modular buildings in the project files.
Ineligibility of Previously Insulated Residences.	It is important that a Sponsor ensure that people in sound insulated residences understand that ongoing maintenance and eventual replacement of the sound insulating measures become the resident's responsibility. AIP funds may only be applied to noise insulate residences a single time. While it is recognized that windows, ventilation systems, and noise insulation improvements will deteriorate over time, noise insulating a residence more than once is not an allowable AIP cost. Therefore, replacement of such components represents a normal home maintenance expense. This provision is reflected in Grant Special Condition K, Noise Projects on Privately Owned Property.

d. Special Circumstances.

The Part 150 regulation provides for special circumstances where residences that do not meet the requirements in Table 1 may be considered eligible for noise attenuation.

The ADO must receive APP-1 concurrence for the proposed treatment of the special circumstances. The ADO must document these special circumstances, including APP-1 approval, in the project file.

Table 4 Special Circumstances for Noise Insulation in Residences

For the following Special Circumstances…	**The Sponsor must determine and the ADO must concur…**
Block Rounding – *Residences that extends beyond the DNL 65 dB*	In determining the reasonable end point for noise insulation projects, the ADO must ensure that the end point is a logical breakpoint (e.g., neighborhood boundary, significant arterial surface street, highway, river, other physical or natural barrier or feature) or whether the end point extends unreasonably beyond a natural break. In these cases, the Sponsor must provide the ADO the proposed end point information. The sponsor must provide the ADO with a list of the specific residences (by address) that will be included in the program. These residences must be noted as "Included due to block rounding." The ADO must review and either approve or disapprove including the residences in the noise insulation program. Note: The airport sponsor may elect not to employ the "block rounding" concept. In such a case it is recommended that the ADO notify APP-1 of the Sponsor's decision not to block round. Once a residence is approved for block rounding, its interior noise levels will determine whether the residence qualifies for noise insulation or whether the residence is considered under the neighborhood equity provisions, below.
Neighborhood Equity – *Residence is in the DNL 65 dB contour, but is not experiencing interior noise levels 45 dB or greater.*	When a *few* residences that do not meet the interior noise level requirements are scattered among residences that do meet the interior noise level criteria, there will be confusion among the homeowners as to why one home is being insulated and another is not. The success of a noise compatibility program in a neighborhood relies on the support of the community. This community support may be lost if there is a sense that some residences are being denied noise insulation. To ensure community support, it may be reasonable to include provisions for neighborhood equity in a noise insulation project. In these cases, the Sponsor develops two sets of noise insulation packages. The standard noise insulation package will be prepared for residences that meet the interior noise criteria. A second package will be prepared consisting of other improvements such as caulking, weather stripping, installation of storm doors or ventilation packages for residences that are

For the following Special Circumstances…	The Sponsor must determine and the ADO must concur…
	not experiencing interior noise 45 dB or greater. In order for grant funding to be available for the secondary package, participation must be limited by FAA policy to less than 10 percent of the residences in the neighborhood, (as logically bounded by either streets or other geographic delineation), but by FAA policy in no case more than 20 residences total in a phase of the noise insulation program. Where there are more than 10 percent or 20 residences proposed for neighborhood equity packages, the costs of this work must be funded with other, non-federal, sources of funds. If a sponsor proposes the use of secondary packages for neighborhood equity, the Sponsor must provide a list to the ADO that outlines the number of residences that are proposed for noise insulation, breaking down the residences that meet criteria and those that do not. The Sponsor's report must also provide detailed information about the proposed neighborhood equity package including costs of the secondary package compared to the cost of a standard noise insulation package. The ADO must review and approve/disapprove the Sponsor's proposed neighborhood equity package to ensure that the use of the minimal neighborhood equity packages on non-eligible residences is required to allow successful completion of the overall noise insulation program in the neighborhood, thus allowing these residences to be noise insulated within the guidelines of AIP eligibility. The ADO must document the approval of the noise insulation package in the project files. In extremely rare cases, ADO may determine that the program will benefit by providing noise equity packages to more than the 10 percent/no more than 20 residence limit. In this instance, the ADO must receive APP-1 approval to exceed this limit. Use of the standard noise insulation package that is designed for residences experiencing noise levels 45 dB or greater for neighborhood equity is not allowable.
Noise Mitigation Package Consisting of Ventilation Only (Continuous Positive Ventilation System) -*For*	Because the interior noise measurements are conducted with "windows closed", there may be situations where a residence does not have an existing ventilation system, but relies on keeping the windows open for air circulation. A Continuous Positive Ventilation System is the allowable package for these residences. The sponsor

For the following Special Circumstances…	The Sponsor must determine and the ADO must concur…
Residences that do not have Continuous Positive Ventilation and when tested, demonstrate interior noise levels less than 45 dB.	must also provide detailed information about the ventilation package including costs of the package compared to the cost of a standard noise insulation package. The sponsor may recommend an air conditioning system in lieu of ventilation- only. Because a ventilation system is likely to increase utility and maintenance costs for the residence, the sponsor should provide information about utility and maintenance costs for the installed equipment to the residence owners.