

Article 18
Aircraft Noise Overlay Zoning

ARTICLE 18 AIRCRAFT NOISE OVERLAY ZONING

18.01 INTENT

The Aircraft Noise Overlay Zone (ANOZ) is hereby created with the following purposes.

- To protect the public health, safety, and welfare by regulating development and land use within noise sensitive areas; and
- To encourage and promote compatibility between surrounding land uses and the aircraft activity around the Dayton International Airport

The Aircraft Noise Overlay Zone shall serve as an overlay zone that applies additional noise level reduction requirements to new regulated structures as defined herein that are located within the underlying zoning district. In the case of conflicting requirements, the more stringent requirements shall apply.

18.02 ZONING DISTRICTS

A. There is hereby established a map entitled the Aircraft Noise Overlay Zoning District Map which indicates the boundaries of the districts hereinafter described. The geographic locations of these districts are indicated on the Miami County Zoning Map, having been duly adopted by the Board of Miami County Commissioners as per the requirements of the Miami County Zoning Resolution and the Ohio Revised Code. Said map shall be maintained in the Miami County Planning and Zoning office. The map, with all explanatory material thereon, is hereby made part of this resolution, and all amendments to the aforementioned map shall be part of this resolution.

B. For the purposes of this section, the Aircraft Noise Overlay Zoning is divided into zoning districts which represent differing levels of aircraft noise impacts. These districts are noted on the official Aircraft Noise Overlay Zoning District Map and designated throughout these regulations by the following numbers:

District A – Includes the areas in which aircraft noise levels (DNL) may be objectionable to new residential building.

18.03 DEFINITIONS

A. Aircraft Noise Overlay Zoning (ANOZ) – The geographic area that is affected by the airport air traffic noise and defined on the basis of those areas immediately affected by the 65 DNL and greater noise exposure are from the 2009 Projected, without abatement, noise contours as shown in the Noise Exposure Maps (NEM's) of the Dayton International Airport 2004 Part 150 Noise Compatibility Plan Update.

Article 18
Aircraft Noise Overlay Zoning

The area is represented as the Aircraft Noise Overlay Zoning (ANOZ) and contains one district based on day-night sound levels (DNL).

B. Day-Night Average Sound Level (DNL) – The estimated cumulative aircraft or other noise exposure in decibels as measured by an A-weighted sound level meter. In calculating the DNL metric, noise exposures are accumulated for a typical 24-hour period and averaged over 365 days. A weighting factor equivalent to a penalty of 10 decibels is applied to aircraft operations or other noise sources between 10:00 p.m. and 7:00 a.m. to account for the increased sensitivity of people to nighttime noise.

C. Decibel (dBA) – A unit of measure of a sound expressed from a calibrated sound level meter utilizing an A-weighting scale.

D. DNL contour – A line linking together a series of points of equal cumulative noise exposure based on the DNL metric. Such contours are developed based upon aircraft flight patterns, number of flights by types of aircraft and time of day, noise characteristics of each aircraft, and typical runway usage patterns.

E. Exterior Doors – All doors with one side exposed to the exterior of the structure or a room or part of the structure that has not been constructed to meet noise level reduction requirements of this regulation that connect to an interior habitable room.

F. Floor Area – The sum of gross areas of all floors of a building or structure exclusive of areas used for off-street parking and loading facilities, whether or not such area is enclosed by walls on each side or a roof. Floors or parts of floors used for purposes incidental or accessory to principal uses such as utility rooms shall be included as part of the floor area of the building or structure within which they are located.

G. Habitable Rooms – Those rooms within an enclosed structure which are, or may reasonably be expected to be utilized as living quarters, such as bedrooms, kitchens, living rooms, family rooms, and dining rooms.

H. Interior Noise Level – The sound level in any habitable room with windows and/or doors closed

I. Modular/Industrialized Unit – A modular structure which complies with the standards and specifications for Industrial Units of Closed Construction, as provided for by the Ohio Building Code as amended and as authorized by the Board of Building Standards pursuant to Ohio Revised Code Section 3781.01 *et seq.*

J. Noise – Aircraft or other noise which interferes with speech and hearing and is unwanted or otherwise annoying.

K. Noise Level Reduction (NLR) – The difference between interior and exterior single event noise levels (SEL's).

Article 18
Aircraft Noise Overlay Zoning

L. Non-Habitable Rooms – Those rooms within an enclosed structure such as bathrooms, garages, furnace, equipment, and/or utility rooms and unfinished basements that are not defined as habitable rooms and are not normally used for sleeping, eating and living activities.

M. Regulated Structures – All proposed new residential type structures and all other non-transient, dwelling type structures, including nursing homes and assisted living structures, wherein person(s) would be domiciled for periods beyond 30 days.

N. Single Event Level (SEL) – The total sound energy of a single sound event that takes into account both its intensity and durations normalized to duration of one second.

O. Sound Transmission Classification (STC) – A classification system adopted by acoustical engineers as a measure of the resistance of a building element such as a door or wall to the passage of audible sounds. STC is measured in a laboratory according to ASTM E90, Standard Test Method for Laboratory measurement of Airborne Sound Transmission Loss of Building Partitions. Audible sounds are defined as voice, music, or any other noises not related to impact sound.

18.04 APPLICATION OF ZONING RESOLUTION

Within the Aircraft Noise Overlay Zoning District (ANOZD), any proposed new regulated structure wherein persons would be domiciled for periods beyond 30 days will be subject to the requirements described herein.

18.05 EXEMPTIONS

The provisions of this section shall not apply to the following when existing or already permitted within the underlying district.

A. Existing Uses: Uses existing on or before the effective date of the section shall not be required to change in order to comply with this section. Any residential building or structure that has been issued zoning approval prior to the adoption of this section shall be exempt. The nonconforming use requirements of this zoning resolution shall apply to the future applicability of the standards and requirements contained herein.

B. Other Uses: Other uses are determined by Miami County to be minor or incidental and within the intent, purposes or objectives of this section.

Article 18
Aircraft Noise Overlay Zoning

18.06 NONCONFORMING STRUCTURES

A. Enlargement, Repair, Alterations: Any residential structure lawfully existing on or prior to the effective date of this section may be enlarged, maintained, repaired or structurally altered.

B. Damage or Destruction: In the event that any residential structure lawfully existing on or prior to the effective day of this section is damaged or destroyed, such replacement or repair of the structure is exempt from this section.

18.07 RIGHT TO APPEAL

An appeal from a decision of the Zoning Inspector with respect to the interpretation or application of the provisions of this section may be taken to the Board of Zoning Appeals by any persons aggrieved by such decision of the Zoning Inspector.

18.08 DEVELOPMENT STANDARDS

The following development standards shall apply to all proposed uses and structures

A. Uses and Structures: Table 1, Aircraft Noise Overlay Zoning Summary Uses and Structures, contained herein, identify standards that apply to proposed uses and structures within the Aircraft Noise Overlay Zoning (ANOZ). All proposed regulated uses and structures must comply with these standards

B. Noise Level Reduction (NLR): All proposed uses and structures must comply with the Noise Level Reduction (NLR) standards as provided in Table 1. Compliance with NLR requirements shall be required prior to issuance of an Occupancy Permit.

18.09 FIELD TESTING OF INTERIOR SOUND LEVELS

Field testing of interior sounds levels may be requested by Miami County as a condition of approval. Where a complaint as to noncompliance with this chapter requires a field test to resolve the complaint, the complainant shall post a bond or adequate funds in escrow for the cost of said testing. Such costs shall be chargeable to the complainant when such field tests show that compliance with this section is in fact present. If such tests show noncompliance, then such testing costs shall be borne by the owner or builder. Actions shall then be immediately undertaken or provided for by the owner or builder to comply with the sound attenuation provisions of this section. All field testing must be performed using appropriate sound measuring devices by technicians trained in their use.

Article 18
Aircraft Noise Overlay Zoning

Table 1
Aircraft Noise Overlay Zone
Summary Uses & Structures

Proposed Uses and Structures	< 65 DNL	District A
Residential Use – includes modular / industrialized units	Y	N (1)
Nursing Homes, extend care facilities	Y	N (1)
Manufactured Homes	Y	N
Key To Table 1 Standards		
Y (Yes)	Land use and related structures are compatible without restrictions	
N (No)	Land use and related structures are not compatible and should be prohibited without restrictions	
(1)	Where Miami County determines that residential uses shall be allowed, measures to achieve outdoor to indoor NLR of at least 25 decibels (dBA) shall be incorporated into building and design specifications. The use of NLR criteria will not eliminate outdoor noise annoyances.	
(2)	New residential building and uses are not permitted.	

18.10 NOISE LEVEL REDUCTION (NLR) DESIGN REQUIREMENTS

A. Purpose: The purpose of this Section is to establish uniform noise level reduction design standards to mitigate the effects of aircraft noise on persons within those regulated structures as defined herein that are located within District A of Aircraft Noise Overlay Zoning District Map. Effects of airborne noise include persistent interference with speech and sleep.

B. Scope: The performance standards in this section are intended to achieve an exterior to interior Noise Level Reduction (NLR) of 25 dBA. The goal is to reduce exterior noise levels by 25 dBA within new regulated structures with doors and windows closed. The standards shall be applied to the construction of new regulated structures within the Aircraft Overlay Zone, District A.

C. Applicability: Structures to be protected shall include all regulated structures defined within the Aircraft Noise Overlay Zoning District and herein, that will be either be wholly or partially within District A of the Aircraft Noise Overlay Zone.

Article 18
Aircraft Noise Overlay Zoning

18.11 NOISE LEVEL REDUCTION STANDARDS

A. The requirements to achieve a minimum noise level reduction (NLR) of 25 dBA as specified herein may be achieved by any suitable combination of building designs, choices of materials, and execution of construction details in accordance with established architectural and acoustical principles. The noise level reduction should be applied to all rooms having one or more exterior walls or ceilings. Compliance with construction standards herein are sufficient to comply with the NLR requirements specified for District A of the Aircraft Noise Overlay Zone.

B. The standards shall be applied to plan and specification for any proposed residential structure or use submitted for zoning approval. If the plans and specifications do not indicate compliance with the standards contained herein, a written statement from a qualified acoustical consultant shall accompany the plans and specifications certifying that the construction of the building as indicated in the plans and specifications will result in a NLR at least as great as the NLR value specified for District A within the Airport Noise Overlay Zone.

C. Sound Transmission Class (STC) rating for windows and door assemblies are valid only if they are determined by laboratory test performed by an independent laboratory for the product manufacturer. A rating estimated for glass alone is not acceptable substitute for STC tests for window assemblies. Likewise, ratings estimated for door leafs along are not acceptable substitute for STC ratings of door assemblies. The installed products must have the same accessories such as storm panels, glazing thickness, glazing size, gaskets, bottom door seals, threshold, etc., as the tested assembly.

D. In order to achieve the STC treating specified herein special measures are necessary to install doors and windows. These include the use of non-hardening (acoustical) caulk at all hidden surfaces, flexible caulk at all exposed surfaces, and the filling of all voids around door and window assemblies in such a manner that voids are completely filled and the perimeter of the door and window assemblies are sealed airtight to the exterior wall construction with a resilient sealant.

E. Non-habitable rooms as defined herein that have not met the prescribed noise level reductions of these regulations, shall be capable of being isolated form other habitable area of the residence by solid core doors with minimum nominal thickness of 1 3/8" with no air vents or openings and an airtight seal and threshold. The perimeter of door frames shall be sealed airtight to the wall construction with resilient sealant conforming to one of the following federal specifications: TT-S-00227, TT-S-00230, or TT-S011-53.

F. Additionally, stud walls common to the habitable and non-habitable rooms shall be at a minimum nominal thickness of four inches, cavity spaces insulated and both sides finished with drywall with no opening to habitable areas.

Article 18
Aircraft Noise Overlay Zoning

G. Compliance with this standards shall require inspection of all exterior walls, door and window assemblies prior to covering or insulating.

18.12 BUILDING REQUIREMENTS – 25 DBA NLR

A. General: All structures regulated under this chapter shall meeting the following criteria:

1. Brick veneer, masonry walls, or stucco exterior walls shall be constructed airtight, except for weep holes.
2. All joints shall be grouted or caulked airtight.
3. At the penetration of the exterior wall by pipes, ducts, or conduits, the space between the wall and pipes, ducts or conduits shall be caulked or filled with mortar.
4. Window and/or through-wall type HVAC units shall not be used.
5. Operational, vented fireplaces shall have air-tight dampers or be enclosed with sealable glass fireplace enclosure/doors.
6. Through-the-wall or door devices such as mailboxes, pet doors, or mail slots shall not be permitted.

18.13 EXTERIOR WALLS

A. Exterior walls other than as described in this section shall have a laboratory sound transmission class rating of at least STC-39.

B. Masonry walls having a surface weight of at least 25 pounds per square foot do not require a furred interior wall. At least one surface of concrete block wall shall be plastered or painted with heavy “bridging” paint.

C. Stud walls shall be at least four inches in nominal depth and shall be finished on the outside with siding on sheathing, stucco, or brick veneer.

1. Interior surface of the exterior stud walls shall be of gypsum board or plaster at least 5/8-inch thick, installed on the studs.
2. Continuous OSB board, plywood, or gypsum board sheathing at least 7/16-inch thick shall cover the exterior side of the wall studs behind wood or other siding. Asphalt wood shake shingles are acceptable forms of siding.

Article 18
Aircraft Noise Overlay Zoning

3. Sheathing panels shall be butted tightly and covered on the exterior with overlapping building paper. The top and bottom edges of the sheathing shall be sealed airtight. All edges of the sheathing shall be sealed with resilient caulking.
4. Insulation material shall be installed continuously throughout the cavity space behind exterior sheathing and between the wall studs. Insulations shall be glass fiber or mineral wool. Batts or blankets shall be held firmly in place between studs, with fasteners if necessary, to prevent sagging; however, packing the insulation such that it is compressed may slightly reduce its acoustical (and thermal) performance.

18.14 WINDOWS

- A. Window assemblies shall have a laboratory sound transmission class rating of at least STC-30
- B. All operable windows shall be weather-stripped and airtight when closed so the air infiltration will not exceed 0.5 cubic foot per minute per foot of crack length in accordance with ASTM E-282-65-T.
- C. Glass of fixed-sash windows shall be sealed in an airtight manner with non-hardening sealant, or equivalent airtight adhesive.
- D. The perimeter or the window frames shall be sealed airtight to the exterior wall construction with a resilient sealant conforming to one of the following federal specifications: TT-S-00227, TT-S-00230, or TT-S001-53.
- E. The total area of the glass for all windows, including skylights and exterior doors in sleeping spaces shall not exceed 20% of the floor area.
- F. Skylights shall have laboratory sound transmission class rating of at least STC-28.

18.15 DOORS

- A. Exterior doors, or door and storm composite assemblies, other than as described in the section shall have a laboratory sound transmissions class rating of at least STC-28
- B. All exterior side-hinged doors shall be solid-core wood or insulated hollow metal at least 1 3/4 –inch thick and shall be fully weather-stripped.
- C. Exterior sliding doors shall be weather-stripped with an efficient airtight gasket

Article 18
Aircraft Noise Overlay Zoning

system that is airtight when closed so that air infiltration will not exceed 0.5 cubic foot per minute per foot of crack length in accordance with ASTM E-282-65-T.

D. Interior doors between non-habitable space and habitable areas shall be solid core doors with minimal nominal thickness of 1 3/8-inch with no vents or openings and an airtight seal and threshold. The perimeter of the door frames shall be sealed airtight to the wall construction with resilient sealant.

E. Glass in doors shall be sealed in an airtight non-hardening sealant or in a soft elastomer gasket, or glazing tape, or equivalent airtight adhesive.

F. The perimeter of door frames shall be sealed airtight to exterior wall construction with a resilient sealant conforming to one of the following federal specifications: TT-S-00227, TT-S-002230, or TT-S001-53.

18.16 ROOFS

A. Combined roof and ceiling construction other than as described in this and the following subsection shall have a laboratory sound transmission class rating of at least STC-39.

B. With an attic or rafter space at least six inches deep, and a ceiling below, the roof shall consist of at least 7/16-inch thickness closely butted OSB board or plywood topped by roofing as required.

C. If the underside of the roof is exposed over a habitable room (as with a cathedral ceiling), or if the attic or rafter space is less than 6-inch, the roof construction shall have a surface weight of at 25 pounds per square foot. Rafters, joists, or other framing may not be included in the surface weight calculation.

18.17 CEILING BELOW ATTICS

A. Gypsum board or plaster ceilings shall be at least 5/8-inch thick. Ceilings shall be substantially airtight, with minimum numbers of penetrations.

B. Glass fiber or mineral wool insulation at least R-38 shall be provided above the ceiling between joists.

C. Recessed light fixtures shall be IC rated and covered with insulation.

Article 18
Aircraft Noise Overlay Zoning

18.18 FLOORS

- A. Openings through the wall to any crawl spaces below the floor of the lowest occupied rooms shall not exceed 2% the floor area of the occupied rooms.
- B. All door and window openings in the fully enclosed basement shall be tightly fitted.
- C. All floors above crawl spaces shall be insulated between joists.
- D. Ventilated crawl spaces that are insulated along the foundation wall are not required to have floor insulation per this requirement.

18.19 VENTILATION

- A. A mechanical ventilation system shall be installed that will provide that the minimum air circulation and fresh air-supply requirements for the various uses in the occupied rooms as specified in the Residential Code Ohio (RCO), without need to open windows, doors, or other openings to the exterior.
- B. Gravity vent openings in the attic shall not exceed code minimum in number and size.
- C. If a fan is used for forced ventilation, the attic inlet and discharge opening shall be fitted with sheet metal transfer ducts of at least 20-gauge steel, which shall be lined with approved one-inch thick glass fiber and shall be at least five feet long with at least one 90-degree bend.
- D. All vent ducts and combustion air ducts connecting the interior space to the outdoors, attics and crawl spaces, excepting domestic range and drier exhaust ducts, shall contain at least a 5-foot length of approved internal sound-absorbing duct lining. Each duct shall be provided with a bend in the duct such that there is no direct line-of-sight through the duct from the venting cross-section to the room opening cross-section.
- E. Duct lining shall be coated glass fiber duct liner at least one-inch thick, approved and suitable for the intended use.
- F. Domestic range and drier exhaust ducts connecting the interior space to the outdoors shall contain a baffle plate across the exterior termination that allows proper ventilation. The dimensions of the baffle plate should extend at least one diameter beyond the line-of-sight into the vent duct. The baffle plate shall be of the same material and thickness as the vent duct material.

Article 18
Aircraft Noise Overlay Zoning

G. Building heating units with flues or combustion air vents shall be located in a closed or room closed off from the occupied space by doors. There shall be no louvers communication between HVAC unit room and habitable rooms.

18.20 SUBSTITUTIONS

Building materials that have been specified in this section may be substituted with other materials that achieve that same or greater noise level reduction as the specified manner.