

**ORDINANCE NUMBER 17681-08-2007**

**AN ORDINANCE AMENDING THE FORT WORTH RESIDENTIAL CODE, BY PROVIDING FOR SOUND ATTENUATION CONSTRUCTION REQUIREMENTS NEAR THE NAVAL AIR STATION JOINT RESERVE BASE; PROVIDING PENALTIES FOR THE VIOLATION THEREOF; PROVIDING THAT THIS ORDINANCE SHALL BE CUMULATIVE; PROVIDING A SEVERABILITY CLAUSE; PROVIDING A SAVINGS CLAUSE; PROVIDING FOR PUBLICATION IN PAMPHLET FORM; PROVIDING FOR PUBLICATION IN THE OFFICIAL NEWSPAPER; AND PROVIDING AN EFFECTIVE DATE.**

**WHEREAS**, the City of Fort Worth has determined that it is appropriate to protect persons within designated noise sensitive buildings from excessive exterior noise near airports through regulations of design and construction of such new buildings in the vicinity of the designated airports;

**NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF FORT WORTH, TEXAS, AS FOLLOWS:**

**SECTION 1.**

Section 7-61 (b) of the Code of the City of Fort Worth (1986) is amended to read as follows:

(b) The following provisions of the Appendix to the 2003 International Residential Code are hereby specifically adopted as amended as part of the Residential Code of the City of Fort Worth:

Appendix Chapter G, Swimming Pools, Spas and Hot Tubs  
Appendix Chapter J, Existing Buildings and Structures  
Appendix Chapter K, Sound Transmission

**SECTION 2.**

Section 7-62 of the Code of the City of Fort Worth (1986) is amended by adding a new Appendix K as follows:

**APPENDIX K**

**SOUND INSULATION REQUIREMENTS FOR NOISE**

## SENSITIVE USES NEAR AIRPORTS

### SECTION AK101 GENERAL

**AK101.1 Scope.** The regulations and requirements shall apply to all new residential buildings and new noise-sensitive non-residential buildings, as defined herein, that are located wholly or partially within the boundaries of the 65 DNL or greater noise contours as designated in Figure AK101.1(1).

The term “new” shall apply to new detached buildings built after the effective date of this ordinance, and shall include later additions or modifications to those same buildings. The term shall also include a Change of Occupancy in existing buildings from a non-protected occupancy to one of the protected occupancies listed herein.

Buildings in existence prior to the effective date, and additions to or modifications of those same buildings, shall not be required to comply, except when a Change of Occupancy from a non-protected occupancy to one of the protected uses is involved.

### SECTION AK102 DEFINITIONS

**AK102.1 General.** The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

**Aircraft noise** – is generally expressed in terms of its A-weighted sound level, in units called “decibels.” Strictly speaking, the decibel unit should be abbreviated only by “dB”; however, for clarity “dBA” and “dB(A)” are often used to highlight the fact that the sound level measurement has been A-weighted.

**Noise exposure** – in areas around airports is expressed in terms of the Day-Night Average Sound Level, which is abbreviated by “DNL” in text and “ $L_{dn}$ ” in equations.

#### **NOISE-SENSITIVE NON-RESIDENTIAL BUILDINGS –**

1. Nursing homes and hospitals, generally classified as Group I; and
2. Child day care centers, Adult day care centers and schools, generally classified as Group E and Group I-4.

**RESIDENTIAL STRUCTURES:** Single-family, Two-family, Townhouse, Multi-family, and Assisted Living uses, generally classified as Group R, whether in a single occupancy or mixed occupancy.

**Sound insulation properties** – of building construction materials are described by Sound Transmission Loss (TL) or Sound Transmission Class (STC). The higher the TL or STC value, the less sound will be transmitted through the building material.

### **SECTION AK103 PURPOSE**

**AK103.1 General.** All buildings and structures with protective uses, as applicable under this chapter, shall be required to have minimum sound insulation standards and requirements to protect the persons within designated noise sensitive buildings from excessive exterior noise through regulation of design, construction and modification of such buildings. After proper sound insulation measures are taken, the interior sound level, attributable to exterior sources, shall not exceed 45 dB.

With the request for a building permit application, or Change of Use permit application, submitted plans shall show evidence of compliance with the sound insulation requirements. Compliance shall consist of submittal of an acoustical analysis report as follows:

1. In accordance with the prescriptive requirements of Section AK104 or the default ratings of Section AK105; or
2. Any qualified design prepared under by a person experienced in the field of acoustical engineering or a registered architect.

### **SECTION AK104 BUILDING REQUIREMENTS**

**AK104.1 General.** Compliance with the following prescriptive provisions shall be deemed to be in compliance with this chapter.

**AK104.2 Building requirements for construction in the 65 dB zone.**

**1. Exterior Walls.**

Walls that form the exterior envelope may be as listed below and shall be constructed as follows:

- a. Wood walls with studs at least 4 inches in nominal depth. Exterior finish shall be stucco, minimum 7/8-inch thickness, brick veneer, masonry, or any siding material allowed by this code. Wood, metal or cementitious fiber siding shall be installed over ½-inch solid sheathing.

Wall insulation shall be at least R-13 glass fiber, or mineral wool or equal and shall be installed continuously throughout the stud space. Foam insulation, as permitted by this code, shall be accepted provided it solidifies to a spongy state and not solid or rigid.

Interior wall finish shall be at least ½” gypsum wallboard

- b. Masonry or concrete load bearing walls. Masonry walls with a surface weight of less than 40 pounds per square foot will require an interior supporting studwall that is finished as required by Item a above.
- c. Or, it is permitted to use any wall designated in Section AK105 with a default STC value of 25\* or greater.

## **2. Exterior Windows**

Windows in the exterior envelope shall be constructed as follows:

- a. All operable windows in the exterior walls shall have a laboratory sound transmission class rating of at least STC 30 dB and shall have air infiltration rate of no more than 0.5 cubic feet per minute when tested according to ASTM E-283; or, shall be double thermopane windows meeting the requirements of the Energy Code.
- b. All fixed windows in the exterior walls shall be at least ¼-inch thick and shall be set in non-hardening glazing materials; or, shall be double thermopane windows meeting the requirements of the Energy Code.
- c. Or, it is permitted to use any window designated in Section AK105 with a default STC value of 25\* or greater.
- d. The total area of glazing in rooms used for sleeping shall not exceed 20 percent of the floor area.

## **3. Exterior Doors**

- a. Exterior hinged doors shall be as follows:
  - 1. a door and edge seal assembly that has a laboratory sound transmission class rating of at least STC 30 dB; or
  - 2. a door, other than a hollow core wood door, that complies with the Energy Code; or,
  - 3. any door installed with a storm door; or,
  - 4. doors installed as part of a vestibule.
- b. Sliding glass doors shall have glass that has a laboratory sound transmission class rating of at least STC 30 dB; or, shall be a sliding glass door that complies with the Energy Code.
- c. Access doors from a garage to a room within a dwelling shall have a laboratory sound transmission rating of at least STC 30 dB; or, shall comply with the Energy Code as a door in the exterior envelope.
- d. Or, it is permitted to use any door designated in Section AK105 with a default STC value of 25\* or greater.
- e. View windows in doors and sidelights shall comply with item 2 above, unless used in a door as listed in 3a above.

## **4. Roof/Ceiling Construction**

- a. Roof rafters shall have a minimum slope of 4:12 and shall be covered on their top surface with ½-inch solid sheathing and any roof covering allowed by this code. An accessible attic space shall be provided above rooms on the uppermost level of Group R buildings.
- b. Commercial type flat roofs are permitted if insulated as required by the Energy Code and a separate lay-in ceiling is added below with an airspace between the two.
- c. Cathedral ceilings are discouraged but, if installed, must have enough space to install the insulation of Item d below, with a minimum of 6" air space between the insulation and the roof deck.
- d. Attic insulation shall be batt or blown-in glass fiber or mineral wool with a minimum R-30 rating applied between the ceiling joists.
- e. Attic ventilation, when installed, shall be:
  - 1. Gable vents or other attic vents that penetrate the attic enclosure shall be fitted with a ½" plywood panel, with 1" semi-rigid insulation attached to the surface facing the vent, so that the panel is at least six inches larger than the vent opening on all sides and is attached to prevent direct line-of-site perpendicular to the vent. The new panel shall also be positioned so that the amount of ventilation is not reduced. Or,
  - 2. Eave vents that are located under the roof overhang.
- f. Ceilings shall be finished with gypsum board or plaster that is at least 5/8-inch thick;
  - or,
  - ½" gypsum board on resilient channels (RC) installed 16" o.c. perpendicular to the joists. Gypsum screws into the RC shall not be long enough to penetrate the wood stud by more than ¼" if occurring over the stud location;
  - or,
  - a lay-in ceiling with an airspace.
- g. Skylights shall penetrate the ceiling by means of a completely enclosed light well that extends from the roof opening to the ceiling opening. A secondary openable glazing panel shall be mounted at the ceiling line and shall be glazed with at least 3/16-inch plastic, tempered or laminated glass. The weather-side skylight shall be any type that is permitted by this code. The total size of skylights shall be no more than 20 percent of the roof area of the room.

## 5. Floors

The floor of the lowest occupied rooms shall be slab on fill, below grade or over a fully enclosed basement or crawlspace. All door and window openings in the fully enclosed basement shall be tightly fitted. All crawlspace vents must be fitted with a ½" plywood panel, with 1" semi-rigid insulation attached to the surface facing the vent, so that the panel is at least six inches larger than the vent opening on all sides and is attached to prevent direct line-of-site perpendicular to the vent. The new panel shall also be positioned so that the amount of ventilation is not reduced.

## 6. Ventilation

- a. A ventilation system shall be provided that will provide at least the minimum air circulation and fresh air supply requirements of the Mechanical Code, in each

room without opening any windows, door or other opening to the exterior.

Openable windows or doors will not be counted for compliance with the fresh air provisions. Fresh air must be brought in through the HVAC system.

- b. Window and/or through-the-wall ventilation or air-conditioning units shall not be used.
- c. All vent ducts connecting the interior space to the outdoors shall contain at least a ten-foot length of internal sound-absorbing duct lining. Each duct shall be provided with a ninety-degree (right angle) 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. Residential bathroom vents discharging at an eave vent need only to have two ninety-degree (right angle) bends.
- d. Kitchen cooktop vent hoods shall be the non-ducted recirculating type with no ducted connection to the exterior.

#### **7. Fireplaces**

Each fireplace constructed of masonry units shall be fitted with a spark arrestor, a damper as required by code and shall have glass doors across the front of the firebox.

#### **8. Wall and Ceiling Openings**

Openings in the exterior that degrades its ability to achieve an interior rating of 45 dB or less when all doors and windows are closed are prohibited. Any access panels, pet doors, mail delivery drops, air conditioning, or other openings must be designed to maintain the 45 dB or less standard in the room to which they provide access.

At the penetration of exterior walls by pipes, ducts, or conduits, the space between the wall and pipes, ducts, or conduits shall be caulked at the pipe duct or conduit or filled with mortar to the wall.

\*STC ratings may overstate the actual attenuation provided by as much as 3 dB, therefore, 25 STC rating in lieu of 20 is mandated.

### **AK104.3 Building requirements for construction in the 70 dB zone.**

#### **1. Exterior Walls**

Walls that form the exterior envelope may be as listed below and shall be constructed as follows:

- a. Wood walls with studs at least 4 inches in nominal depth. Exterior finish shall be stucco, minimum 7/8-inch thickness, brick veneer, masonry, or any siding material allowed by this code. Wood, metal or cementitious fiber siding shall be installed over 1/2-inch solid sheathing.

Wall insulation shall be at least R-13 glass fiber, or mineral wool or equal and shall be installed continuously throughout the stud space. Foam insulation, as permitted by this code, shall be accepted provided it solidifies to a spongy state and not solid or rigid.

Interior wall finish shall be at least 5/8-inch gypsum wallboard or plaster;  
or,  
1/2" gypsum wallboard installed on resilient channels (RC) installed 16" o.c.  
perpendicular to the studs. Gypsum screws into the RC shall not be long enough  
to penetrate the wood stud by more than 1/4" if occurring over the stud location.

- b. Masonry or concrete load bearing walls. Masonry walls with a surface weight of less than 40 pounds per square foot will require an interior supporting studwall that is finished as required by Item a above.
- c. Or, it is permitted to use any wall designated in Section AK105 with a default STC value of 30\* or greater. When using door/window openings with a default STC value of less than 30 STC but not less than 25 STC, the STC of the wall shall be downrated by 20%.

## 2. Exterior Windows

Windows in the exterior envelope shall be constructed as follows:

- a. All operable windows in the exterior walls shall have a laboratory sound transmission class rating of at least STC 35 dB and shall have air infiltration rate of no more than 0.5 cubic feet per minute when tested according to ASTM E-283.
- b. All fixed windows in the exterior walls of rooms shall:
  - 1. Have a laboratory sound transmission class rating of at least STC 35 db, or
  - 2. Be 5/8-inch laminated glass with a laboratory sound transmission class rating of at least STC 35 db and shall be set in non-hardening glazing materials, or
  - 3. Be glass block at least 3-1/2 inches thick.
- c. Or, it is permitted to use any window designated in Section AK105 with a default STC value of 30\* or greater.
- d. The total area of glazing in rooms used for sleeping shall not exceed 20 percent of the floor area.

## 3. Exterior Doors

- a. Exterior hinged doors shall be as follows:
  - 1. a door and edge seal assembly that has a laboratory sound transmission class rating of at least STC 35 dB; or
  - 2. a door, other than a hollow core wood door, that complies with the Energy Code and installed with a storm door; or,
  - 3. doors installed as part of a vestibule.
- b. Sliding glass doors shall have glass that has a laboratory sound transmission class rating of at least STC 35 dB.
- c. Access doors from a garage to a room within a dwelling shall have a laboratory sound transmission rating of at least STC 30 dB; or, shall comply with the Energy Code as a door in the exterior envelope.
- d. Or, it is permitted to use any door designated in Section AK105 with a default STC value of 30\* or greater.
- e. View windows in doors and sidelights shall comply with item 2 above, unless used in a door as listed in 3a above.

#### 4. Roof/Ceiling Construction

- a. Roof rafters shall have a minimum slope of 4:12 and shall be covered on their top surface with ½-inch solid sheathing and any roof covering allowed by this code. An accessible attic space shall be provided above rooms on the uppermost level of Group R buildings.
- b. Commercial type flat roofs are permitted if insulated as required by the Energy Code and a separate lay-in ceiling is added below with an airspace between the two.
- c. Cathedral ceilings are discouraged but, if installed, must have ¾" solid decking above, enough space to install the insulation of Item d below, with a minimum of 6" air space between the insulation and the roof deck.
- d. Attic insulation shall be batt or blown-in glass fiber or mineral wool with a minimum R-30 rating applied between the ceiling joists.
- e. Attic ventilation, when installed, shall be:
  1. Gable vents or other attic vents that penetrate the attic enclosure shall be fitted with a ½" plywood panel, with 1" semi-rigid insulation attached to the surface facing the vent, so that the panel is at least six inches larger than the vent opening on all sides and is attached to prevent direct line-of-site perpendicular to the vent. The new panel shall also be positioned so that the amount of ventilation is not reduced. Or,
  2. Eave vents that are located under the roof overhang.
- f. Ceilings shall be finished with gypsum board or plaster that is at least 5/8-inch thick. Ceiling materials shall be mounted on resilient channels;  
or,  
a lay-in ceiling with an airspace.
- g. Skylights shall penetrate the ceiling by means of a completely enclosed light well that extends from the roof opening to the ceiling opening. A secondary openable glazing panel shall be mounted at the ceiling line or at a point that provides at least a 4-inch space between the skylight glazing and the secondary glazing and shall be glazed with at least 3/16-inch plastic or laminated glass. The weather-side skylight shall be any type that is permitted by this code. The total size of skylights shall be no more than 20 percent of the roof area of the room.

#### 5. Floors

The floor of the lowest occupied rooms shall be slab on fill, below grade or over a fully enclosed basement or crawlspace. All door and window openings in the fully enclosed basement shall be tightly fitted. All crawlspace vents must be fitted with a ½" plywood panel, with 1" semi-rigid insulation attached to the surface facing the vent, so that the panel is at least six inches larger than the vent opening on all sides and is attached to prevent direct line-of-site perpendicular to the vent. The new panel shall also be positioned so that the amount of ventilation is not reduced.

#### 6. Ventilation

- a. A ventilation system shall be provided that will provide at least the minimum air circulation and fresh air supply requirements of the Mechanical Code, in each



room without opening any windows, door or other opening to the exterior.

Openable windows or doors will not be counted for compliance with the fresh air provisions. Fresh air must be brought in through the HVAC system.

- b. Window and/or through-the-wall ventilation or air-conditioning units shall not be used.
- c. All vent ducts connecting the interior space to the outdoors shall contain at least a ten-foot length of internal sound-absorbing duct lining. Each duct shall be provided with a ninety-degree (right angle) 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. Residential bathroom vents discharging at an eave vent need only to have two ninety-degree (right angle) bends.
- d. Kitchen cooktop vent hoods shall be the non-ducted recirculating type with no ducted connection to the exterior.

#### **7. Fireplaces**

Each fireplace constructed of masonry units shall be fitted with a spark arrestor, a damper as required by code and shall have glass doors across the front of the firebox.

#### **8. Wall and Ceiling Openings**

Openings in the exterior that degrades its ability to achieve an interior rating of 45 dB or less when all doors and windows are closed are prohibited. Any access panels, pet doors, mail delivery drops, air conditioning, or other openings must be designed to maintain the 45 dB or less standard in the room to which they provide access.

At the penetration of exterior walls by pipes, ducts, or conduits, the space between the wall and pipes, ducts, or conduits shall be caulked at the pipe duct or conduit or filled with mortar to the wall.

\*STC ratings may overstate the actual attenuation provided by as much as 3 dB, therefore, 30 STC rating in lieu of 25 is mandated.

### **AK104.4 Building requirements for construction in the 75 dB or greater areas.**

#### **1. Exterior Walls**

Walls that form the exterior envelope may be as listed below and shall be constructed as follows:

- a. Wood walls with studs at least 4 inches in nominal depth. Exterior finish shall be stucco, minimum 7/8-inch thickness, brick veneer, masonry, or any siding material allowed by this code. Wood, metal or cementitious fiber siding shall be installed over 3/4-inch solid sheathing.

Wall insulation shall be at least R-13 glass fiber, or mineral wool or equal and shall be installed continuously throughout the stud space. Foam insulation, as permitted by this code, shall be accepted provided it solidifies to a spongy state and not solid or rigid.

Interior wall finish shall be at least 5/8-inch gypsum wallboard installed on resilient channels (RC) installed 16" o.c. perpendicular to the studs. Gypsum screws into the RC shall not be long enough to penetrate the wood stud by more than 1/4" if occurring over the stud location.

- b. Masonry or concrete load bearing walls. Masonry walls with a surface weight of less than 40 pounds per square foot will require an interior supporting studwall that is finished as required by Item a above.
- c. Or, it is permitted to use any wall designated in Section AK105 with a default STC value of 35\* or greater. When using door/window openings with a default STC value of less than 35 STC but not less than 30 STC, the STC of the wall shall be downrated by 20%.

## 2. Exterior Windows

Windows in the exterior envelope shall be constructed as follows:

- a. All operable windows in the exterior walls shall have a laboratory sound transmission class rating of at least STC 40 dB and shall have air infiltration rate of no more than 0.5 cubic feet per minute when tested according to ASTM E-283.
- b. All fixed windows in the exterior walls of rooms shall:
  - 1. Have a laboratory sound transmission class rating of at least STC 40 db, or
  - 2. Be 5/8-inch laminated glass with a laboratory sound transmission class rating of at least STC 40 db and shall be set in non-hardening glazing materials, or
  - 3. Be glass block at least 3-1/2 inches thick.
- c. Or, it is permitted to use any window designated in Section AK105 with a default STC value of 35\* or greater.
- d. The total area of windows and doors in rooms used for sleeping shall not exceed 20 percent of the floor area.

## 3. Exterior Doors

- a. Exterior hinged doors shall be as follows:
  - 1. a door and edge seal assembly that has a laboratory sound transmission class rating of at least STC 40 dB; or
  - 2. a solid-core wood or insulated metal door at least one (1) inch thick separated by an airspace of at least four (4) inches from another door, which can be a storm door. Both doors shall be tightly fitted and weather-stripped; or,
  - 3. doors installed as part of a vestibule.
- b. Sliding glass doors shall have glass that has a laboratory sound transmission class rating of at least STC 40 dB;  
or,  
a double sliding glass door, separated by a minimum four-inch airspace. Each door shall comply with the air leakage rate of the Energy Code. Glass shall be at least three-sixteenths (3/16) inch thick but not equal in thickness between the two doors, and tempered or laminated.

- c. Access doors from a garage to a room within a dwelling shall have a laboratory sound transmission rating of at least STC 30 dB; or, shall comply with the Energy Code as a door in the exterior envelope.
- d. Or, it is permitted to use any door designated in Section AK105 with a default STC value of 35\* or greater.
- e. View windows in doors and sidelights shall comply with item 2 above, unless used in a door as listed in 3a above.
- f. The joint between the wall opening and the door frame shall be continuously filled with glass fiber insulation and the exterior cover trim shall be continuously caulked to seal the joint.

#### 4. Roof/Ceiling Construction

- a. Roof rafters shall have a minimum slope of 4:12 and shall be covered on their top surface with ½-inch solid sheathing and any roof covering allowed by this code. An accessible attic space shall be provided above rooms on the uppermost level of Group R buildings.
- b. Commercial type flat roofs are permitted if insulated as required by the Energy Code and a separate lay-in ceiling is added below with an airspace between the two.
- c. Cathedral ceilings are discouraged but, if installed, must have 1" solid decking above, have enough space to install the insulation of Item d below, with a minimum of 6" air space between the insulation and the roof deck. Structural information shall be provided confirming adequate support of the decking.
- d. Attic insulation shall be batt or blown-in glass fiber or mineral wool with a minimum R-30 rating applied between the ceiling joists.
- e. Attic ventilation, when installed, shall be:
  - 1. Gable vents or other attic vents that penetrate the attic enclosure shall be fitted with a ½" plywood panel, with 1" semi-rigid insulation attached to the surface facing the vent, so that the panel is at least six inches larger than the vent opening on all sides and is attached to prevent direct line-of-site perpendicular to the vent. The new panel shall also be positioned so that the amount of ventilation is not reduced. Or,
  - 2. Eave vents that are located under the roof overhang.
- f. Ceilings shall be finished with gypsum board or plaster that is at least 5/8-inch thick. Ceiling materials shall be mounted on resilient channels; or, a lay-in ceiling with an airspace.
- g. Skylights shall penetrate the ceiling by means of a completely enclosed light well that extends from the roof opening to the ceiling opening. A secondary openable glazing panel shall be mounted at the ceiling line or at a point that provides at least a 4-inch space between the skylight glazing and the secondary glazing and shall be glazed with at least 3/16-inch plastic or laminated glass. The weather-side skylight shall be any type that is permitted by this code. The total size of skylights shall be no more than 20 percent of the roof area of the room.

#### 5. Floors

The floor of the lowest occupied rooms shall be slab on fill, below grade or over a fully enclosed basement or crawlspace. All door and window openings in the fully enclosed basement shall be tightly fitted. All crawlspace vents must be fitted with a ½" plywood panel, with 1" semi-rigid insulation attached to the surface facing the vent, so that the panel is at least six inches larger than the vent opening on all sides and is attached to prevent direct line-of-site perpendicular to the vent. The new panel shall also be positioned so that the amount of ventilation is not reduced.

## **6. Ventilation**

- a. A ventilation system shall be provided that will provide at least the minimum air circulation and fresh air supply requirements of the Mechanical Code, in each room without opening any windows, door or other opening to the exterior. Openable windows or doors will not be counted for compliance with the fresh air provisions. Fresh air must be brought in through the HVAC system.
- b. Window and/or through-the-wall ventilation or air-conditioning units shall not be used.
- c. All vent ducts connecting the interior space to the outdoors shall contain at least a ten-foot length of internal sound-absorbing duct lining. Each duct shall be provided with a ninety-degree (right angle) 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. Residential bathroom vents discharging at an eave vent need only to have two ninety-degree (right angle) bends.
- d. Kitchen cooktop vent hoods shall be the non-ducted recirculating type with no ducted connection to the exterior.

## **7. Fireplaces**

Each fireplace constructed of masonry units shall be fitted with a spark arrestor, a damper as required by code and shall have glass doors across the front of the firebox.

## **8. Wall and Ceiling Openings**

Openings in the exterior that degrades its ability to achieve an interior rating of 45 dB or less when all doors and windows are closed are prohibited. Any access panels, pet doors, mail delivery drops, air conditioning, or other openings must be designed to maintain the 45 dB or less standard in the room to which they provide access.

At the penetration of exterior walls by pipes, ducts, or conduits, the space between the wall and pipes, ducts, or conduits shall be caulked at the pipe duct or conduit or filled with mortar to the wall.

\*STC ratings may overstate the actual attenuation provided by as much as 3 dB, therefore, 35 STC rating in lieu of 30 is mandated.

## **SECTION AK105 DEFAULT COMPONENT RATINGS**

**AK105.1 General.** The acoustical performance of the building depends on the combined performances of each of the elements. The final result depends on the transmission loss (or STC) and the relative surface areas of the elements. If any of the components has poor insulation properties the overall performance can be seriously weakened. Windows are usually one of the weakest elements in the dwelling's sound insulation performance.

The following default STC ratings may be used in determining the sound envelope of the building. The required combined default values are as follows:

**Zone 65 dB** – The sound enclosure must be comprised of all components, wall, window, doors and roof that each have a default STC rating of 25\* or higher.

**Zone 70 dB** – The sound enclosure must be comprised of all components, wall, window, doors and roof that have a default STC rating of 30\* or higher. It is permitted to use windows and doors of less than 30 STC but not less than 25 STC rating, provided the wall STC shall be downrated by 20% and the non-compliant window/door area shall not exceed 20% of the floor area per room.

**Zone 75 or higher dB** – The sound enclosure must be comprised of all components, wall, window, doors and roof that have a default STC rating of 35\* or higher. It is permitted to use windows or doors with less than 35 STC but not less than 30 STC rating, provided the wall STC shall be downrated by 20% and the non-compliant window/door area shall not exceed 20% of the floor area per room.

\*STC ratings may overstate the actual attenuation provided by as much as 3 dB, therefore, all STC rating requirements are upgraded by 5.

<b>Walls</b>	<b>STC</b>	<b>STC when under-rated windows or doors are used</b>
Exterior siding, 1/2" solid sheathing, 2 x 4" nominal stud 16" o.c., fiberglass insulation, 1/2" interior gypsum attached directly to studs	39	31
7/8" stucco, No. 15 felt building paper and 1" wire mesh, 2 x 4" nominal stud 16" o.c., fiberglass insulation, 1/2" gypsum board attached directly to stud.	46	37
Face Brick, 1/2" air space with metal ties, 3/4" insulation board sheathing, 2 x 4" nominal studs 16" o.c., fiberglass building insulation, 1/2" gypsum board attached directly to studs	56	45
1" stucco, 8" thick hollow concrete block, 1/2" gypsum attached to furring strips	49	39
Exterior siding, 7/16" solid sheathing, 2 x 4" nominal stud 16" o.c., batt insulation, resilient channels, 1/2" gypsum board	43	34

Exterior siding, 7/16" solid sheathing, 2 x 6" nominal stud 16" o.c., batt insulation, resilient channels, 1/2" gypsum board	47	37
Exterior siding, 7/16" solid sheathing, 2 x 4" staggered studs 16" o.c. on 2 x 6" base plate, batt insulation, 1/2" gypsum attached directly to studs	50	40

<b>Windows</b>	<b>STC</b>
Wood double hung, closed but unlocked, single glazing	23
Aluminum sliding, latched, single glazing	24
Wood double hung, closed but unlocked, glazed with 7/16" insulating glass	22
1/8" double glazed window with 1/4" air space	26
1/4" single glazed window	30
1/4" laminated glass single glazed window	34
1/4" + 1/8" double glazed window with 2" airspace	39
1/4" + 1/8" double glazed window with 4 3/4" airspace	43

<b>Doors</b>	<b>STC</b>
Wood, flush solid core, with brass weather stripping	27
Wood, flush solid core, plastic weather stripping, aluminum storm door	34
Wood, French door, brass weather stripping	26
Steel, flush, with urethane foam core, with magnetic weather stripping	28
Wood, solid core	26
Steel or fiberglass	25
Sliding glass	27

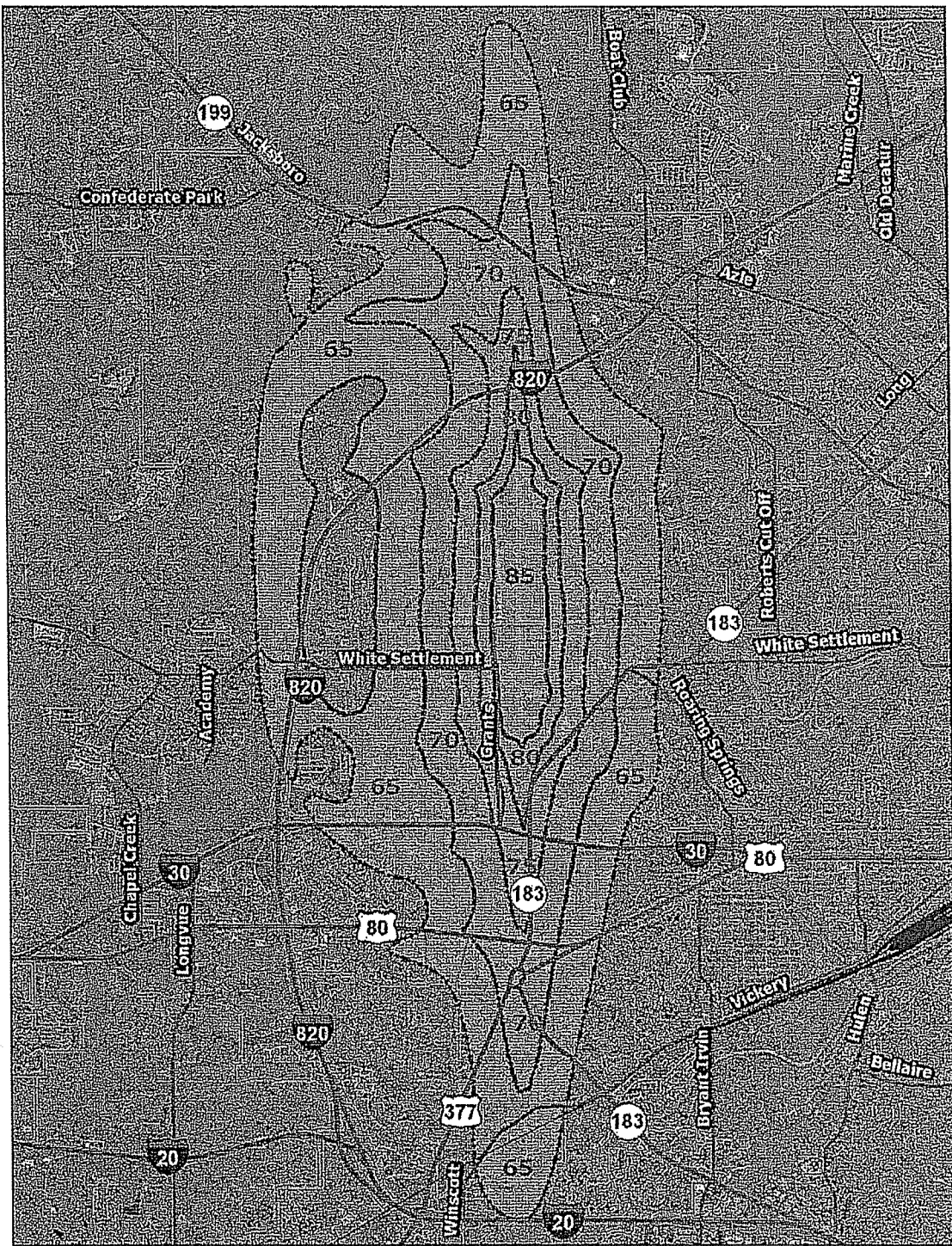


Figure AK101.1(1)

### **SECTION 3.**

This article shall be cumulative of all provisions of ordinances and of the Code of the City of Fort Worth, Texas (1986), as amended, except where the provisions of this article are in direct conflict with the provisions of such ordinances and such Code, in which event conflicting provisions of such ordinances and such Code are hereby repealed.

### **SECTION 4.**

It shall be unlawful for any person to erect, construct, enlarge, alter, repair, move, improve, remove, convert, demolish, equip, use, occupy, or maintain any building or structure in the City or cause the same to be done contrary to or in violation of any of the provisions of this Code. Any person, firm or corporation violating any of the provisions of this ordinance shall be deemed guilty of a misdemeanor and upon conviction thereof shall be punishable by a fine not to exceed Two Thousand Dollars (\$2,000.00) for all violations involving fire safety, or public health and sanitation and shall be fined not more than Five Hundred Dollars (\$500.00) for all other violations of this ordinance. Each day or any portion thereof during which any violation of this ordinance occurs or continues shall be deemed a separate offense and upon conviction thereof shall be punishable as herein provided.

### **SECTION 5.**

It is hereby declared to be the intention of the City Council that the sections, paragraphs, sentences, clauses, and phrases of this ordinance are severable, and, if any phrase, clause, sentence, paragraph, or section of this ordinance shall be declared void, ineffective, or unconstitutional by the valid judgment or final decree of any court of competent jurisdiction, such voidness, ineffectiveness, or unconstitutionality shall not affect any of the remaining phrases, clauses, sentences, paragraphs, and sections of this ordinance, since the same would have been enacted by the City Council without the incorporation in this ordinance of any such void, ineffective, or unconstitutional phrase, clause, sentence, paragraph, or section.

### **SECTION 6.**

This ordinance constitutes a digest and revision of the Building Code of the City of Fort Worth, as provided in Section 2, Chapter XXV, and Section 9, Chapter XXVII, of the Charter of the City of Fort Worth. The Development Department of the City of Fort Worth, Texas, is hereby authorized to publish this ordinance in pamphlet form for general distribution among the public, and the operative provisions of this ordinance, as so published, shall be admissible in evidence in all courts without further proof than the production thereof, as provided in Chapter XXV, Section 3, of the Charter of the City of Fort Worth, Texas.



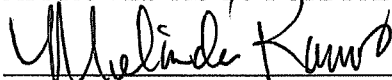
**SECTION 7.**

The City Secretary of the City of Fort Worth, is hereby directed to publish the caption, penalty clause, and effective date of this ordinance for two (2) days in the official newspaper of the City of Fort Worth, Texas as authorized by Section 2, Chapter XXV of the Charter of the City of Fort Worth, Texas and by Section 52.013 (a) of the Texas Local Government Code.

**SECTION 8.**

This ordinance shall take effect upon adoption and publication as required by law.

APPROVED AS TO FORM AND LEGALITY:

  
\_\_\_\_\_  
Assistant City Attorney

Adopted: August 9, 2007

Effective: August 24, 2007

*City of Fort Worth, Texas*  
**Mayor and Council Communication**

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**COUNCIL ACTION: Approved on 8/9/2007 - Ord. Nos. 17680-08-2007 and 17681-08-2007**

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**DATE:** Thursday, August 09, 2007

**LOG NAME:** 06AIRPORT NOISE

**REFERENCE NO.:** PZ-2747

**SUBJECT:**

Adopt Ordinances Amending the Building Code and Residential Code to Add Noise Attenuation Provisions for Noise-Sensitive Uses in the Naval Air Station Joint Reserve Base Noise Impact Areas

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**RECOMMENDATION:**

It is recommended that the City Council adopt the attached ordinances amending the Building Code and the Residential Code by adding construction provisions for attenuation of airport noise for certain uses in the Naval Air Station Joint Reserve Base noise impact areas.

**DISCUSSION:**

The City of Fort Worth, other adjacent municipalities, and Tarrant County are participating in a Joint Land Use Study (JLUS) associated with the Naval Air Station Joint Reserve Base. The purpose of the JLUS is to promote compatible community growth that supports military training and operational missions at the Joint Reserve Base. A JLUS Policy Committee is overseeing the study and will issue recommendations in October 2007. The recommendations will seek to minimize incompatible development in the noise impact areas, which are depicted in the attached ordinances. Each municipality will then review the recommendations and revise their development regulations on an individual basis.

Given the potential for incompatible development while the study recommendations are prepared and implemented, the City Council authorized staff to prepare building code amendments for noise sensitive uses in the noise impact areas. These uses include residences, nursing homes, hospitals, day care centers, and schools. The code amendments would require noise attenuation in the construction of new buildings to achieve an interior noise level of 45 DNL. The requirements will apply to exterior walls, exterior windows, exterior doors, roof/ceiling construction, wall and ceiling openings, floors, ventilation and fireplaces. The attached ordinances would amend the Building Code and the Residential Code.

In June and July, City staff briefed affected property owners, the Development Advisory Committee, and representatives of the Fort Worth Builders Association, Greater Fort Worth Association of Realtors, and the Fort Worth Chamber of Commerce. The City Council endorsed the proposed code amendments at the pre-Council meeting on July 31.

The ordinance amendments would affect property in COUNCIL DISTRICTS 3 and 7.

**FISCAL INFORMATION/CERTIFICATION:**

The Finance Director certifies that this action will have no material effect on City funds.

**TO Fund/Account/Centers**

**FROM Fund/Account/Centers**

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**Submitted for City Manager's Office by:**

Dale Fisseler (6266)

**Originating Department Head:**

Fernando Costa (8042)

**Additional Information Contact:**

Al Godwin (7825)

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