

**ARTICLE XII**  
**ENVIRONMENTAL AND**  
**OPERATIONAL PERFORMANCE STANDARDS**

**SECTIONS**

- 12-101 ENVIRONMENTAL PERFORMANCE STANDARDS**
- 12-102 HILLSIDE DEVELOPMENT STANDARDS**
- 12-103 DEVELOPMENT STANDARDS FOR FLOOD HAZARD AREAS**
- 12-104 DEVELOPMENT STANDARDS FOR AREAS OF PROBLEM SOIL**
- 12-105 OPERATIONAL PERFORMANCE STANDARDS**
- 12-106 SPECIFIC STANDARDS**

**12-101 ENVIRONMENTAL PERFORMANCE STANDARDS**

**12-101.1 Purpose and Intent**

The purpose of this section is to establish development standards for environmentally sensitive land areas, in a manner that provides for reasonable use of land while retaining to the maximum extent possible the environmentally sensitive portions in a predeveloped state. These provisions are predicated on the concept that land use policy decisions are made in the context of land characteristics. Optimally, these characteristics include all physical as well as locational characteristics of a development site. The requirements and standards of this section are intended to promote low-impact development of identified environmentally sensitive areas by the use of incentives aimed at minimizing environmental disturbance.

**12-101.2 Applicability**

The provisions of this section are applicable to the following environmentally sensitive lands:

1. Steep Hillsides

The hillside development standards apply to predevelopment conditions for new development on slopes of fifteen (15) percent or greater.

2. Special Flood Hazard Areas

The floodplain development standards apply to predevelopment conditions for new development within "Areas of Special Flood Hazard" identified in Article VIII of this ordinance.

3. Problem Soil Areas

The problem soils development standards apply to predevelopment conditions for new development located within the listed soil types as identified in the Williamson County Soil Survey (U.S.D.A., Soil Conservation Service). The groundwater protection standards developed herein shall apply to any lot not served by public water and/or sewer.

#### 4. Exemptions

The provisions of this section shall not apply to the following:

- a. Any construction, development or use initiated pursuant to any valid building permit or approved Final Site Development Plan issued or approved prior to adoption of this ordinance.
- b. Any essential public utility facility, system or roadway initiated to provide utility services or access to a property.
- c. Repairs or replacement to an existing structure or building that does not increase the impervious surface area of the site more than twenty-five (25) percent.
- d. Construction of a single-family or duplex dwelling on a lot which was platted and recorded at the time of adoption of this ordinance.

#### **12-101.3 Variable Lot Size Option**

Within development sites that contain steep slopes, areas subject to flooding or problem soils the clustering of residential lots on portions of a development site that are not subject to such problems is strongly encouraged. Within such developments, the provisions of Article V, Subsection 5-104.3, (Variable Lot Residential Development) shall apply. Portions of the development site within variable lot size developments that contain slopes of twenty (20) percent or greater, are subject to flooding or are identified as wetlands shall be retained as open space.

### **12-102 HILLSIDE DEVELOPMENT STANDARDS**

#### **12-102.1 Residential Sites**

Residential development on property that includes slopes of fifteen (15) percent or greater shall minimize changes to grade, cleared area, and volume of cut and fill on the site and shall be subject to the following standards.

##### 1. Single and Two-family Dwellings

###### a. Site Plan Required

Any lot two (2) acres or less in size that is created for use as a building site for a single or two family dwelling shall be considered a "critical lot". Approval of a site development plan containing the information required by Subsection 4-102.103 (Lots Located on Steep Slopes), of the Subdivision Regulations, shall be required.

###### b. Minimum Lot Size

Within areas of steep slopes the following minimum lot size provisions shall apply.

NATURAL SLOPE	MINIMUM LOT SIZE
< 15%	SEE TABLE 5-103 A
15% < 20%	3 ACRES
> 20%	5 ACRES

2. Multi-family Development

a. Density Reductions

In all R-M, Multi-Family Zone Districts, manipulation of natural slopes shall result in the following reductions in density permitted for those portions disturbed:

**MULTI-FAMILY DENSITY ADJUSTMENT FACTORS**

NATURAL SLOPE	STANDARD DENSITY		ADJUSTMENT FACTOR		EFFECTIVE DENSITY
< 15%	SEE TABLE	X	1.0	=	EFFECTIVE
15%< 20%	5-103 A	X	.5	=	EFFECTIVE
>20%		X	0.0	=	EFFECTIVE

b. Protection of Steep Slopes

That portion of a multi-family development site that contains slopes greater than twenty (20) percent shall remain undisturbed.

**12-102.2 Nonresidential Sites**

1. Reductions in Allowable Impervious Surface Ratio (ISR)

In all nonresidential districts, manipulation of natural slopes shall result in the following reductions in allowable Impervious Surface Ratio (ISR) for those portions disturbed.

**NONRESIDENTIAL ISR ADJUSTMENT FACTORS**

NATURAL SLOPE	STANDARD ISR		ADJUSTMENT FACTOR		EFFECTIVE ISR
< 15%	SEE TABLES	X	1.0	=	EFFECTIVE
15%< 20%	6-103A & 7-103A	X	.5	=	EFFECTIVE
>20%		X	0.0	=	EFFECTIVE

2. Grading Standards for Hillside Sites in Nonresidential Zone Districts

Grading standards for hillside sites in nonresidential zone districts shall be as follows:

a. Minimal Disruptions

For lots or parcels containing natural slopes of twenty (20) percent or greater, approval of a Final Site Development Plan shall be based upon a demonstration that the development plan minimizes disturbance to these slopes. Architectural and engineering features that reduce unnecessary encroachment on steep slopes may include, but are not limited to, use of retaining walls and structural foundations to return to natural grade.

b. Slope Stabilization

Finished slopes shall be stabilized by perennial vegetative cover. Slope face stabilization by use of rip-rap or hydraulically applied concrete is prohibited.

**12-103 DEVELOPMENT STANDARDS FOR FLOOD HAZARD AREAS**

**12-103.1 Residential Sites**

Residential development on property located within an area of Special Flood Hazard shall comply with the following

1. Single and Two-family Dwellings

a. Applicability

Any lot or parcel less than five (5) acres in size that is created for use as a building site for a single or two family dwelling shall be considered a "critical lot" and no land area located within an area of Special Flood Hazard prior to manipulation shall be used to satisfy minimum lot size requirements of the district after manipulation.

b. Site Development Plan Required

Approval of a site development plan containing the information required by Article VIII, Section 8-303, shall be based upon a demonstration that the proposal complies in all respects with the provisions of Section 8-301 (Floodplain District Regulations).

c. Cluster Lot Option

Residential lots may be clustered on portions of a site outside the unmanipulated area of Special Flood Hazard. Within such developments, the provisions of Article V, Subsection 5-104.3, (Variable Lot Residential Development) shall apply. Portions of the development site that are located within an area of Special Flood Hazard shall be retained as open space.

2. Multi-Family Development

a. Density Reductions

In all R-M, Multi-Family Zone Districts, manipulation of areas of Special Flood Hazard shall result in the following reductions in density permitted for those portions disturbed:

**MULTI-FAMILY DENSITY ADJUSTMENT FACTORS**

FLOODPLAIN RELATIONSHIP	STANDARD DENSITY		ADJUSTMENT FACTOR		EFFECTIVE DENSITY
ABOVE FLOOD	SEE TABLE 5-103-A	X	1.0	=	EFFECTIVE
PREDEVELOPMENT FLOODPLAIN, UNDISTURBED	SEE TABLE 5-103-A	X	1.0	=	EFFECTIVE
PREDEVELOPMENT FLOODPLAIN, DISTURBED	SEE TABLE 5-103-A	X	.5	=	EFFECTIVE
PREDEVELOPMENT FLOODWAY, UNDISTURBED	SEE TABLE 5-103-A		1.0	=	EFFECTIVE
PREDEVELOPMENT FLOODWAY, DISTURBED	SEE TABLE 5-103-A		0.0	=	EFFECTIVE

**12-103.2 Nonresidential Sites**

1. Reductions in Allowable Floor Area Ratio (FAR)

In all nonresidential districts, manipulation of Special Flood Hazard areas shall result in the following reductions in allowable Floor Area Ratio (FAR) for those portions disturbed.

**NONRESIDENTIAL FAR ADJUSTMENT FACTORS**

FLOODPLAIN RELATIONSHIP	STANDARD FAR		ADJUSTMENT FACTOR		EFFECTIVE FAR
ABOVE FLOOD	SEE TABLES 6-103A & 7-103A	X	1.0	=	EFFECTIVE
PREDEVELOPMENT FLOODPLAIN, UNDISTURBED	SEE TABLES 6-103A & 7-103A	X	1.0	=	EFFECTIVE
PREDEVELOPMENT FLOODPLAIN, DISTURBED	SEE TABLES 6-103A & 7-103A	X	.5	=	EFFECTIVE
PREDEVELOPMENT FLOODWAY, UNDISTURBED	SEE TABLES 6-103A & 7-103A	X	1.0	=	EFFECTIVE
PREDEVELOPMENT FLOODWAY, DISTURBED	SEE TABLES 6-103A & 7-103A	X	0.0	=	EFFECTIVE

2. Reductions in Allowable Impervious Surface

In all nonresidential districts, manipulation of Special Flood Hazard areas shall result in the following reductions in maximum allowable impervious surface according to the table below.

<b><u>IMPERVIOUS SURFACE REDUCTION</u></b>	
<b><u>CATEGORY</u></b>	<b><u>REDUCTION TO MAXIMUM IMPERVIOUS SURFACE ALLOWED ABOVE THE AREA OF SPECIAL FLOOD HAZARD</u></b>
<b><u>Floodplain</u></b>	Deduct 2.0 x manipulated area of Special Flood Hazard from allowable Impervious Surface above the floodplain.
<b><u>Floodway</u></b>	Deduct 5.0 x manipulated area of Special Flood Hazard from allowable Impervious Surface above the floodplain.

**12-104 DEVELOPMENT STANDARDS FOR AREAS OF PROBLEM SOIL**

**12-104.1 Wetlands and Unstable Soils**

Lots or parcels where the following soils are indicated by the Williamson County Soil Survey (U.S.D.A., Soil Conservation Service), shall be considered a "critical lot". Any application for approval of a Master Development Plan, a Final Site Development Plan or a plat of subdivision shall be accompanied by a geotechnical report. Both the development plan and the geotechnical report shall be certified by a Geotechnical Engineer licensed by the State of Tennessee. The Geotechnical Engineer shall certify that the construction techniques adequately mitigate any potential soil hazards identified in the report.

**SOIL TYPE**

**CHARACTERISTICS TO BE  
ADDRESSED IN PLAN OR  
REPORT**

**Delrose**

**Slippage Condition**

**12-104.2 Groundwater Protection and Subsurface Sewage Disposal**

The following minimum area standards shall apply to any lot not served by public water and/or sewer. No lot shall be created that is smaller than as indicated herein:

<b><u>LOT CONDITION</u></b>	<b><u>MINIMUM LOT AREA</u></b>
<b>Without Public Water and Sewer</b>	<b>40,000 sq. ft.</b>
<b>With Public Water, but No Sewer</b>	<b>20,000 sq. ft.</b>

**12-105 OPERATIONAL PERFORMANCE STANDARDS**

**12-105.1 Purpose and Intent**

It is the purpose of this section to provide appropriate standards relating to the operation of certain activities throughout the Planning Jurisdiction. Such operations may create or maintain such excessive noise, vibration, air pollution, odor, or electromagnetic interference as to be a detriment to the public health, comfort, convenience, safety and welfare. These standards are therefore provided to protect the public interest and promote the public health and welfare.

**12-105.2 Applicability**

1. In all districts every building or other structure or tract of land that is established, developed or constructed shall comply with each and every performance standard contained in this section, as applicable.
2. When the use or building or other structure is extended, enlarged or reconstructed after the effective date of this Zoning Ordinance, the applicable performance standards shall apply with respect to such extended, enlarged, or reconstructed portion or portions of such use or building or other structure.
3. In the case of any conflict between the activity type and the performance standards, the latter shall control.
4. The provisions of this section shall apply notwithstanding the issuance after the effective date of this ordinance of any zoning permit or certification of zoning compliance.
5. In case of conflict between the performance standards set forth herein and any rules or regulations adopted by any other governmental agencies, the more restrictive shall apply.

**12-105.3 General Exemptions**

The follow activities or sources are exempt from these regulations.

1. Temporary construction, excavation and grading.

2. Demolition activities which are necessary and incidental to the development of facilities on the same lot, on another of several lots being developed at the same time, or on the public right-of-way or easement for a community facility activity.
3. Aircraft, railway and operating motor vehicles.

**12-106 SPECIFIC STANDARDS**

**12-106.1 Noise**

1. Applicability

These standards apply to noise from any machinery or equipment that is part of or operated within any development provided for in this ordinance, including continuous and intermittent noise, noise emitted by speaker boxes and any other commercial or industrial activities which are under the control of the occupant of a building site.

2. Method of measurement

Noise shall be measured with a sound level meter which meet the standards pertinent for Type 52A, meters of the American National Standards Institute specifications for sound level meters. Noise levels shall be measured using an A-weighted sound pressure level scale. Impact noises, produced when two (2) or more objects strike each other, shall be measured using the fast response of the sound level meter, and other noises using the slow response. For purposes of this ordinance, impact noises shall be considered to be those noises whose peak values are more than three (3) decibels higher than the values indicated on the sound level meter.

3. Required Performance Level

The maximum permitted sound pressure levels in decibels across lot lines and district boundaries shall be in accordance with following table. This table shall be used to determine the maximum noise level, measured in A-weighted decibels, which shall be permitted at the property line of the closest use in each of the following categories.

Receiving Land Use Category	Sound Level Limit (dBA)	
	7 a.m. - 8 p.m.	8 p.m. - 7 a.m.
Residential	55	50
Community Facility	55	50
Commercial	65	60
Manufacturing	75	75
Agricultural and Extractive	75	75



**12-106.2 Vibration**

1. Applicability

These standards are to apply to the operation of any device that creates a vibration above the "vibration threshold" (See Subpart 2, below) at or beyond the property boundary of the source if on private property or at one hundred-fifty (150) feet from the source if on public space or public right-of-way.

2. Method of Measurement

Vibration displacement shall be measured with an instrument capable of simultaneously measuring in three (3) mutually perpendicular directions. Measurements shall be made at or beyond the adjacent lot line or the nearest residential district boundary line as described herein. The maximum permitted displacements shall be determined by the following formula:

$$D = \frac{K}{F} \quad \text{Where } D = \text{Displacement (in inches)}$$

**K = A constant to be determined by reference to the tables below**

**F = The frequency of the transmitted vibration (in cycles per second)**

3. Required Performance Level

No activity or operation shall cause vibrations in excess of the maximum displacement permitted at the points described below for the district indicated. The maximum permissible displacement shall be determined by the use of the formula presented in Subpart 2, of this section, and the appropriate "K" **Constant** shown in the tables, below.

**VALUES OF K TO BE USED IN CALCULATING PERMISSIBLE VIBRATION IN THE I-R DISTRICT**

<b>LOCATION</b>	<b>K</b>
<b><u>On or Beyond Any Adjacent Lot Line</u></b>	
Continuous	<b>0.015</b>
Impulsive	<b>0.030</b>
Less Than 8 Pulses per 24-Hour Period	<b>0.075</b>
<b><u>On or Beyond Any Residential District Boundary Line</u></b>	
Continuous	<b>0.003</b>
Impulsive	<b>0.006</b>
Less Than 8 Pulses per 24-Hour Period	<b>0.015</b>

**VALUES OF K TO BE USED IN CALCULATING  
PERMISSIBLE VIBRATION IN THE I-G AND I-S DISTRICTS**

<b>LOCATION</b>	<b>K</b>
<b><u>On or Beyond Any Residential District Boundary Line</u></b>	
<b>Continuous</b>	<b>0.006</b>
<b>Impulsive</b>	<b>0.012</b>
<b>Less Than 8 Pluses per 24-Hour Period</b>	<b>0.030</b>

**12-106.3 Smoke and Particulate Matter**

Any land use or other activity which involves the emission of smoke, particulate matter, or other air pollutants shall comply with all applicable standards set forth in State and Federal Statutes and regulations regarding the emission of air pollutants. Any such land use or other activity shall also obtain and maintain all necessary licenses and permits from the appropriate State and Federal Agencies, such as the United States Environmental Protection Agency.

**12-106.4 Odor**

1. Applicability

Any use established in an industrial district shall be so operated as to comply with the performance standards governing noxious odorous materials set forth hereinafter for the district in which such use is located. No use already established on the effective date of this ordinance shall be so altered or modified as to conflict with, or further conflict with the provisions of this section. In addition, to the performance standards specified hereinafter, the emission of noxious odorous matter in such a manner or quantity as to be detrimental to or endanger the public health, safety, comfort or welfare is hereby declared to be a public nuisance and shall henceforth be unlawful/

2. Required Performance Level

a. Standards Applicable Within I-R Districts and at Any Boundary of a Residential District

Within any I-R District and along any boundary separating any industrial district from any residential district, the emission of noxious odorous matter in such quantities as to be detectable at any point along lot lines when diluted in the ratio of one volume of noxious odorous air to four (4) or more volumes of clean air is prohibited.

b. Standards Applicable Within I-G and I-S Districts

Within any I-G or I-S District, except along any residential district boundary where the provisions of Subpart a, above, shall apply,

the emission of noxious odorous matter in such quantities as to be detectable at any point along lot lines when diluted in the ratio of one volume of noxious odorous air to eight (8) or more volumes of clean air is prohibited.

### **12-106.5 Toxic, Hazardous and Radioactive Matter**

1. Applicability

The provisions of this section shall apply to all uses and activities located within any zoning district.

2. Continuous Compliance with Federal, State and Local Laws and Regulations Required

Any land use or activity which involves the use of toxic, hazardous, or radioactive materials shall comply at all times with all applicable standards set forth in local, State and Federal statutes and regulations regarding the use, storage, transportation, emission, and disposal of such materials. Any such land use or other activity shall also obtain and maintain all necessary licenses from the appropriate State and Federal Agencies, such as the United States Environmental Protection Agency.

3. Required Performance Level

In all zoning districts inclusive, no use shall for any period of time discharge across the boundaries of the lot where it is located toxic matter in such concentrations as to be detrimental to or endanger the public, safety, comfort or welfare, or cause injury or damage to property or business.

### **12-106.6 Glare**

1. Applicability

The standards contained within this section shall apply in all commercial and industrial districts and to all community facilities activities located within any district.

2. Required Performance Level

a. All site lighting shall be shielded so that substantially all directly emitted light falls within the property line. No illumination in excess of one-half (1/2) foot-candle shall be permitted within the boundaries of any adjacent residentially developed property. A foot-candle is the illumination at all points one (1) foot distance from a uniform point source of one (1) candlepower.

b. All exterior building floodlights shall be shielded so that all of the light falls upon either the surface of the structure or on the ground.

- c. No illumination shall produce direct, incident, or reflected light that interferes with the safe movement of motor vehicles on public streets. Lighting prohibited by this provision shall include, but not be limited to:
  - i. Any light that may be confused with or construed as a traffic control device;
  - ii. Any animated, flashing, or changing intensity lights, except for temporary holiday displays.

## **12-106.7 Fire and Explosive Hazards**

### **1. Applicability**

The standards contained within this section shall apply in all commercial and industrial districts and to all community facility activities located within any district.

### **2. Required Performance Level**

- a. All flammable solid, liquid and gaseous substances shall be stored and used in accordance with all applicable Federal , State, and local statutes and regulations.
- b. In all nonresidential zoning districts, the storage or use of solid materials or products ranging from incombustible to moderate burning is permitted.
- c. In all nonresidential zoning districts, the storage or use of solid materials or products ranging from free or active burning to intense burning is permitted, provided that either of the following conditions is met. Free or active burning to intense burning is a rate of combustion described by material that burns with a high degree of activity and is consumed rapidly. Examples include sawdust, powdered magnesium, pyroxylin, and other solids deemed by the fire marshal to have equivalent burning characteristics.
  - i. Solid materials or products shall be stored or used within completely enclosed buildings having no less than two (2) hour fire-resistant exterior walls and protected with an automatic fire extinguishing system; or
  - ii. Said material, if stored outdoors, shall be no less than fifty (50) feet from the nearest lot line.
- d. Storage tanks for flammable liquids and gasses shall be located no closer than fifty (50) feet to any lot line.

**12-106.8 Electromagnetic Interference**

In all districts, no use, activity or process shall be conducted which produces electromagnetic interference with radio and television reception on an property beyond the lot line on which such activity exists.

**12-106.9 Nonconforming by Reason of Operational Performance Standards**

Any use existing on the effective date of this ordinance, or subsequent amendment as applicable, and permitted by right that does not meet the requirements of one (1) or more of the operational performance standards established explicitly in this section or by reference shall be subject to the provisions of Article XIII, Subsection 13-102.11, (Special Provisions Pertaining to Uses Not Conforming to Performance Standards).