

## ARTICLE 13

### LANDSCAPING, TREE PROTECTION, AND EROSION CONTROL

#### DIVISION 13.000 PURPOSE

This Article provides the detailed landscaping standards for installing and maintaining landscaping materials and protecting specimen trees. Also, this Article provides the requirements for erosion control.

#### DIVISION 13.100 PLANT UNITS AND MATERIALS

This Division establishes a standard landscaping element called a "plant unit". The plant unit serves as a basic measure of plant material required for all landscaping except natural areas, pedestrian precincts, or mitigation. The plant unit provides a balance of vegetation.

#### SECTION 13.110 STANDARD PLANT UNITS

Each plant unit alternative in Table 13.110 is generally interchangeable with the standard plant unit. The developer is free to use any one or a combination of alternatives. However, some alternatives are preferred given certain objectives. For example, Alternative Unit D is best suited for the interior of parking lots or other places where clear, low-level views are desired or fences exist. Where year-round screening is required, Alternative Unit B or C is preferred. In some cases, this Ordinance may specify a specific plant unit, or an alternative plant unit may be required during subdivision or site plan review.

#### SECTION 13.120 ON-LOT LANDSCAPING

In general the on-lot landscaping shall be distributed around the lot, planted close to the buildings, or in some combination of these planting schemes. However, front yards are particularly important to preserving community character. Certain unit types require additional planting material to be planted between front load garages and the right-of-way or as indicated in Section 13.121.

<b>PLANT UNIT ALTERNATIVES</b>	<b>SIZE &amp; TYPE OF PLANTS REQUIRED</b>	<b>QUANTITY</b>
<b>STANDARD PLANT UNIT</b>	2.5" caliper canopy tree	1
	1.5" understory tree	2
	3 gallon shrubs	13
<b>ALTERNATIVE UNIT A*</b>	2.5" caliper canopy tree	1
	1.5" understory tree	1
	6' high evergreen trees	1
	3 gallon shrubs	11
<b>ALTERNATIVE UNIT B*</b>	1.5" understory tree	2
	6' high evergreen trees	3
	3 gallon shrubs	7
<b>ALTERNATIVE UNIT C*</b>	6' high evergreen trees	4
	3 gallon shrubs	15
<b>ALTERNATIVE UNIT D*</b>	2.5" caliper canopy tree	2
	3 gallon shrubs	3
* Preferred for year-round screen.		
** May be required where visibility is required for automobile operation.		

**SECTION 13.121 SPECIAL RESIDENTIAL LANDSCAPING**

Village House and units using side-load garages shall install special landscaping in addition to the landscaping required by Table 04.110 A.

- A. Village House street yards shall be landscaped with two additional items. Select one from each of three following categories. These additions shall be included in one of two ways. The plan shall identify the techniques on each lot or options can be included in the house price and selected by the home purchaser.
  - 1. **Property-line Border.**
    - a. Stone wall or wood or wrought-iron fence at least three (3) feet in height; or
    - b. Hedge with shrubs planted at a maximum of three (3) feet on center; or
    - c. A grade change of at least two (2) feet, raising the street yard above the sidewalk grade. This option is available only where the natural topography slopes up from

the sidewalk on that side of the street. This option must run across at least three (3) consecutive lots and be identified on grading plans to ensure adequate drainage.

2. **Additional Landscaping.**

- a. Two (2) flowering understory trees at one and one-half (1.5) inch caliper.
- b. Two (2) evergreen trees at least five (5) feet high.
- c. Three (3) decorative evergreen trees at least ten (10) gallon pot.
- d. A perennial flower bed having a minimum of five (5) species over eighty (80) square feet and one (1) understory or evergreen of the size indicated in a.. and b. above.

3. **Structure.** One (1) of the following and ten (10) flowering or evergreen shrubs at least twenty-four (24) inches high. These options are not available where a front-load garage is used on a lot with less than ninety (90) feet of frontage.

- a. A roofed porch which is not enclosed or screened, running three-quarters (0.75) the width of the house front and having a minimum width of seven (7) feet.
- b. A masonry or stone patio raised a minimum of eighteen (18) inches above the front yard, minimum eight (8) foot width, and at least five hundred (500) square feet.

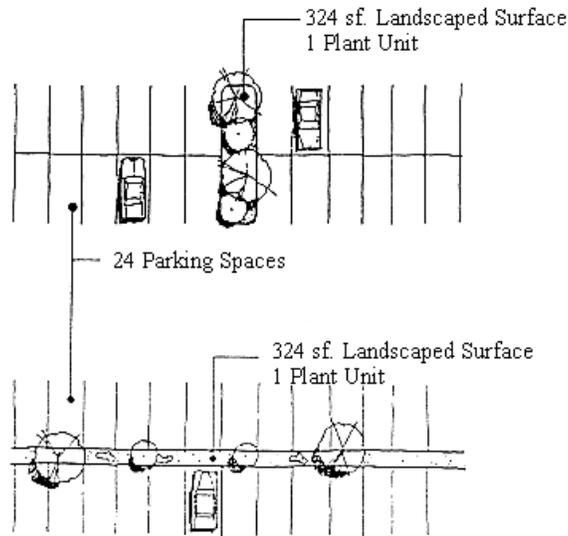
B. **Side-Loading Garages.** An extra plant unit shall be required between the street and the side of the garage facing the street; or, the developer may propose planting options that in the Planning Commission's opinion are approximately equal in cost and effectiveness.

### **SECTION 13.130 PARKING LOT LANDSCAPING**

Parking lot landscaping shall be one (1) plant unit per number of parking spaces specified in Table 4.110

A. Each plant unit shall be planted in a planting island or space with a minimum total area of three hundred twenty-four (324) square feet. The plant unit may be distributed between two landscaping islands or in larger continuous islands. If two smaller islands are selected, each shall contain a minimum of one hundred sixty-two (162) square feet in area. In small parking lots, the island(s) may be the lot's corners. The landscaping required by Table 4.110 A. shall be located within the parking lot or adjoining entrance drives and circulation drives. Existing trees that can be preserved by leaving the area under their canopy undisturbed shall count towards the landscaping requirements. Figure 13.130 illustrates appropriate planting areas, preservation of existing trees, and several configurations of one (1) plant unit per twelve (12) parking spaces. Plantings along the perimeter of a parking lot shall not be considered as part of the parking lot landscaping requirements.

**Figure 13.130**  
**EXAMPLES OF PARKING LOT LANDSCAPING CONFIGURATIONS**



Illustrating: 1.0 Plant Unit per 24 parking spaces

**SECTION 13.140 STANDARDS FOR BUFFERYARD PLANTINGS**

Table 13.140 depicts the narrowest and widest widths of bufferyards and the plant materials in plant units and structures necessary to reach given levels of opacity or buffertype required by Table 4.110 A. This table presents only two combinations of bufferyard width and number of plant units. In actuality, a wide range of other combinations would also meet the respective opacity rating. Flexibility is encouraged; by using the interactive bufferyard system in Section 13.141, the designer may create and test a buffer. The standards are for one hundred (100) linear feet of buffer measured at the bufferyard's centerline. Figure 13.140 shows the two bufferyard options set forth to achieve a 0.50 opacity and several others that were developed using Section 13.141. Some limited or conditional uses have requirements (Table 03.110) that increase bufferyards; these requirements shall be met by adding the opacities of the district bufferyard and the limited or conditional use. For example, if the district requires a 0.3 bufferyard and the specific use requires a 0.2 bufferyard, a 0.5 bufferyard shall be selected.

**Table 13.140  
BUFFERYARD REQUIREMENTS PER 100 LINEAR FEET<sup>1</sup>**

Opacity	Bufferyard Width (ft.)	Number of Plant Units	Type of Structure Required
st1	in R.O.W.	2 - 2.5" caliper trees	n/a
st2	in R.O.W.	2 - 2.5" caliper trees	n/a
parking buffer	5	1.00	masonry wall, evergreen hedge at 4' oc., or hedge at 3' oc.
	15	3.00	
.10	5	0.40 <sup>2</sup>	4 ft. hedge at 10' oc.
	15	0.45	
.20	5	0.80 <sup>2</sup>	4 ft. fence - 75% opaque
	20	1.20	
.30	5	0.85 <sup>2</sup>	6 ft. fence - 100% opaque
	25	2.00	
.40	10	1.65 <sup>2</sup>	6 ft. fence - 100% opaque
	40	2.55	
.50	15	2.45 <sup>2</sup>	6 ft. fence - 100% opaque
	40	3.50	
.60	20	2.75 <sup>2</sup>	8 ft. fence - 100% opaque
	40	4.50	
.70	25	3.60 <sup>3</sup>	8 ft. fence - 100% opaque
	60	5.00	
.80	25	4.60 <sup>3</sup>	8 ft. fence - 100% opaque
	80	5.65	
1.00	40	6.40 <sup>3</sup>	8 ft. masonry wall
	100	7.35	

<sup>1</sup> The street buffers st1 and st2 are per 100 feet of street frontage.

<sup>2</sup> This option may be used in the D, TA, NC-R1, NC-R2, and NC-R3 Districts.

<sup>3</sup> This option may be used as in footnote 1, or on lots where the next smallest buffer

Table 13.140 BUFFERYARD REQUIREMENTS PER 100 LINEAR FEET <sup>1</sup>			
Opacity	Bufferyard Width (ft.)	Number of Plant Units	Type of Structure Required
would use 20% of the site.			

(Ordinance #2835, 08/26/03)

**SECTION 13.141 BUFFERYARDS**

A. The standards in Table 13.140 have been tested to ensure they meet the opacity standard. Numerous other mixes can meet the standard. The bufferyards were created using the Kendigsoft Bufferyard Model; this model is available within the LDO. Any bufferyard that meets the required opacity rating within the width limits in Table 13.140 is permitted. The Kendigsoft Model can also be used. Table 13.141 lists the settings that shall be used in running the model. This model determines whether or not the tested bufferyard is adequate.

Table 13.141 LANE KENDIG, INC. BUFFERYARD MODEL SETTINGS				
Factor		Setting		
Building Height		30 ft.		
Viewpoint		120 ft.		
Overlap Factor		0.8		
Opacity Factor		0.6		
Plant Unit Area		500		
Plant Type Settings:				
Factor	Canopy	Understory	Conifer	Shrub
Shape	2	3	4	6
Height	26.0	16.0	18.0	3.5
% Opacity	0.85	0.85	1.00	0.80

B. Buffers over fifty (50) feet wide must meet the height screening requirement of the model without a berm. Narrower buffers shall be permitted without meeting the model's height screening.

**DIVISION 13.200 LANDSCAPING INSTALLATION REQUIREMENTS**

To ensure plant materials are installed and properly maintained, a landscape plan will be required of all developments. This plan shall show all required plant material's location. A plant list shall accompany the plan, indicating species, size, and number provided. The plan shall also indicate how the plants will receive moisture and the presence or absence of irrigation facilities.

**SECTION 13.210 PERFORMANCE BOND**

The developer shall submit a bid for the landscaping that shall be reviewed by the Zoning Officer. A bond, landscape contractor guarantee, or other acceptable surety equal to one hundred (100) percent of the cost shall be provided to ensure proper installation and maintenance.

**SECTION 13.220 REPLACEMENT**

The developer shall be responsible for replacing all plants that die during a two (2) year period from the date of installation. The City may use the bond or surety to replace plants if the developer fails to perform adequately. After the initial two (2) year period, the landowner or, in the case of plant material in common open space, the home or property owners= association, shall be responsible for maintaining and replacing any plants that die.

**SECTION 13.230 IRRIGATION**

The landscaping areas should use plants that can survive with the area's natural rainfall and do not need irrigation. Where the planting areas cannot naturally be provided with adequate moisture for the plant types to be installed, an irrigation system shall be installed to ensure the plants receive adequate moisture. See Section 8.153.

**SECTION 13.240 PLANTING LOCATIONS**

The exact placement of required plants and structures shall be the decision of each user, except the following requirements that shall be met:

- A. Trees and shrubs shall be planted clear of the road-salt spray area, or the planting area shall consist of highly salt tolerant plants.
- B. Evergreens and evergreen shrubs shall be planted with a fifteen (15) foot spacing to maximize their chance for survival.

**SECTION 13.250 AFFORESTATION REQUIREMENTS**

All areas to be afforested and all forest mitigation areas shall be planted with the material listed in Table 13.250. The area around each tree shall be mulched. The entire area may be mulched or seeded in a perennial grass mix with twenty (20) percent prairie mix. Canopy/evergreen trees shall be selected to provide a diversity of native plants. Plantings shall involve a minimum of four (4) species. Where more than one hundred (100) canopy/evergreen trees are required, a minimum of six (6) species shall be provided; no one species shall have less than five (5) or more than thirty (30) percent of the total trees.



<b>Table 13.250 AFFORESTATION REQUIREMENTS PER ACRE</b>	
<b>No. of Plants</b>	<b>Types of Plants</b>
1	4" caliper canopy or 10-12 ft. evergreen tree
4	3" caliper canopy or 8-10 ft. evergreen tree
10	1-1/2" caliper canopy or 6 ft. evergreen tree
6	1-1/2" caliper or 5-6 ft. understory trees
50	6' whip canopy or 3 ft. evergreen trees
30	bare root shrubs or 1 gallon pots

**SECTION 13.251 WETLAND PLANTING**

Wetland plantings, whether for mitigation or because of soil or drainage considerations, shall meet the following standards. The plantings shall be based on an on-site investigation by a person qualified in wetland restoration.

- A. Plant material can be of various types -- wet prairie (little standing water), marsh (emergent vegetation), or swamp (woody plants). The selected plant type shall be based on soil, moisture regime, and local conditions. Plant communities should not be forced into unsuitable environments.
- B. If on-site investigation indicates a quality seed bank exists, maintenance may be all that is required.
- C. Drainageway areas may or may not need excavations and additional suitable soils. They may require drainage control structures to maintain desired water levels. The on-site investigation and wetland type selection shall dictate the actions required.
- D. Mitigation areas may require the site's over-excavation and the addition of suitable soils, seedbank, and plants. Means to supply and maintain water levels shall be established.

**SECTION 13.260 EXISTING VEGETATION**

Where natural vegetation will be preserved on-lot or within open space, bufferyards, or parking lots, that plant material shall be credited towards that specific landscaping requirement in accordance with Table 13.260. Note preserved vegetation shall count for only one (1) landscaping requirement. For example, a sixteen (16) inch tree to be preserved along a property line may count for three (3) open space trees or three (3) bufferyard trees. Also, preserved tree types (canopy, understory, or evergreen) shall only be credited for same tree type requirement.

Table 13.260 PRESERVED TREES CREDITED TOWARDS REQUIREMENTS		
Preserved Tree Size (DBH)	Number of Trees For	
	Open Space or Bufferyards	Parking Lots or Lots
24 inches +	4	2.5
16-24 inches	3	2
8-15.9 inches	2	1.75
3-7.9 inches	1	1

Also, the following requirements must be met:

- A. A tree survey is conducted locating the individual trees to be preserved or, in the case of a forest, trees within fifty (50) feet of the edge of construction areas.
- B. Individual trees described in the tree survey as healthy and intended to count toward the landscaping requirements shall count only if sufficient protection as indicated below is provided:
  1. Trees greater than twenty-four (24) inches DBH: No area within five (5) feet of the drip line shall be disturbed. No topographic change greater than eighteen (18) inches shall occur at the edge of the protected area. A tree expert should indicate the probability that the tree will survive and may require trimming prior to the construction. Only those trees with a high probability of survival will be credited.
  2. Trees between sixteen (16) inches and less than twenty-four (24) inches DBH: No area under the drip line is to be disturbed.
  3. Trees between eight (8) and less than sixteen (16) inches DBH: No area within the dripline is to be disturbed.
  4. Trees between three (3) and less than eight (8) inches DBH: No more than thirty (30) percent of the area within the drip line shall be disturbed.
- C. Trees sixteen (16) inches or greater DBH whose natural drainage is cut off by recontouring or exposed to heavier drainage shall not be credited toward a landscaping requirement unless a management plan approved by a qualified forester is established to protect the tree.
- D. Areas classified as mature or young forest shall count as meeting the following landscaping requirement provided:
  1. **Open Space.** The forested area is at least one-half (0.5) acre, seventy-five (75) feet wide part, and will be left undisturbed. Where the area is less than one-half (0.5) acre or less than seventy-five (75) feet wide and to remain undisturbed, a tree survey is required and the trees to be credited will be calculated individually as in Table 13.260.
  2. **Bufferyards.**

- a. Where the forested area is two (2) times the width of the bufferyard or seventy-five (75) feet wide, whichever is greater, and to remain undisturbed, the bufferyard requirement shall be considered met. No tree survey is required.
- b. Where the forested area width equals or exceeds the minimum bufferyard width of the required opacity that does not include a fence, hedge, or berm (Table 13.140), all trees with less than ten (10) percent of their canopy undisturbed shall be credited in accordance with Table 13.260.

### **DIVISION 13.300 TREE PROTECTION**

Specimen trees shall be located on the plat or land development plan. The development design shall preserve specimen trees wherever practical. The City may require plat revision where additional preservation is possible without affecting density. Where preservation is not feasible, tree replacement shall be required as mitigation. Any mitigation shall be in addition to the other landscaping requirements of this Ordinance.

### **SECTION 13.310 PRESERVING SPECIMEN TREES**

A specimen tree is preserved by protecting eighty (80) percent of the area under the tree=s drip line. The following techniques shall be used to preserve the maximum number of specimen trees:

- A. The tree=s drip line shall be fenced with three (3) foot orange snow fencing, and no earth moving shall be permitted inside the fenced area.
- B. Development design shall attempt to protect specimen trees by locating them in side yard or other setbacks.
- C. Horizontal road alignments may be reduced. Pavement center lines may meander in rights-of-way.
- D. Building pads altering the building envelope may be required.
- E. Multi-story buildings may be required to reduce building footprints. Where the site contains steep slopes, the Planning Commission may require parking under the building.

### **SECTION 13.320 TREE REPLACEMENT**

Where specimen trees are removed, they shall be replaced in accordance with Table 13.320.

Table 13.320 SPECIMEN TREE REPLACEMENT		
Size of Specimen Tree (DBH in inches)	Number of Replacement Trees	Size and Type
8.00 to 11.99	3	2" canopy trees
12.00 to 15.99	4	2" canopy trees
16.00 to 19.99	5	2-1/2" canopy trees
20.00 to 23.99	6	2-1/2" canopy trees
greater than 24	8	3" canopy trees

**SECTION 13.330 STREET TREES**

- A. A street tree shall be defined as any tree planted within the city street right of way. No tree shall be planted within five feet of concrete.
- B. Street trees shall be chosen from an approved list submitted by the Paola Tree Board and approved by the City of Paola. The species list will be reviewed and revised as needed.
- C. Trees of the same species shall not be planted adjacent to one another. An exception may be granted to areas within overlay districts, i.e. downtown city entrance.
- D. Street trees shall have a minimum caliper of 1 ½ inches. (Ordinance 2969, 03/27/07)

**DIVISION 13.400 EROSION CONTROL**

All development disturbing ground cover for other than agricultural purposes on areas exceeding ten thousand (10,000) square feet shall submit an erosion control plan. Those plans shall locate all required structures and ground cover requirements. Special requirements are required in the Lake Miola watershed (Section 13.430).

**SECTION 13.410 STRUCTURES**

If required by conditions and existing or proposed topography, the following structures shall be provided. The City's Director of Public Works shall approve such structures.

- A. Silt fencing shall be installed at least two (2) days prior to the start of earth moving along the following:
  - 1. All wetlands, ponds, and floodplains to prevent silting of those areas.
  - 2. The entire down-stream border of water supply watersheds.
  - 3. Anywhere the drainage would enter a terraced area on adjoining farmland.
- B. Temporary silt traps shall be installed along swales or ditches exceeding three hundred (300) feet or as required by swale or ditch slope. They shall also be required at the entrance to all detention basins.

**SECTION 13.420 GROUND COVER**

Ground cover shall be re-established as soon as practical within the construction period. In any event, only active earth-moving areas shall be left unvegetated for more than six (6) months. Seeding of cool season grasses shall be performed between February 15 and April 30th or August 15 and September 30th. Other forms of temporary cover shall be required if land cannot be seeded within the seeding period. In addition, the following standards shall apply:

- A. Ditches with a slope greater than four (4) percent shall use erosion control measures as approved by Staff to aid in establishing ground covers. These measures shall be required until such ground covers are well established.
- B. Areas to be planted with grass shall use a 1:3 maximum slope ratio for ease of mowing.
- C. All ground covers other than grass shall be approved by Staff. These ground covers shall be indigenous and used in areas of low pedestrian traffic only.

**SECTION 13.430 LAKE MIOLA WATERSHED STANDARDS**

In addition to meeting the standards in Section 13.410 and 13.420, all developments shall meet the following standards to ensure a minimum amount of erosion, sedimentation, and pollution reach the Lake Miola water supply reservoir:

- A. All subdivision and land development plans shall be submitted for review by the Miami County Soil and Water Conservation District. The district shall recommend the best management practices and long-term maintenance of detention and erosion control measures. The City may require the developer to conform to these management and design elements. If long-term maintenance is required, a special assessment district shall be created to maintain the system.
- B. During construction, extra silt fencing or sedimentation structures may be required. The use of mats and/or restricting construction areas may be required to reduce the amount of disturbed land left open to erosion.
- C. Mass grading of sites may be prohibited. No cut or fill that would change the original grade of a lot by more than two (2) feet shall be permitted. Foundations shall be stepped to remain within these limits.