

CHAPTER 830

ZONING ORDINANCE: LANDSCAPING

830-1. Purpose

The purpose of this chapter is to establish minimum standards for the provision, installation, and maintenance of landscape plantings in order to complement the natural environment and achieve a healthy, beautiful, and safe community. These regulations are intended to:

- (A) Preserve Monroe County's existing natural vegetation and the incorporation of native plants, plant communities, and ecosystems into landscape design, where possible.
- (B) Foster aesthetically pleasing development that will protect and preserve the appearance and character of the community and foster a sense of place.
- (C) Increase the compatibility of development with both adjacent development and the natural environment.
- (D) Improve environmental quality, habitat for wildlife, and watershed health by recognizing the numerous beneficial effects of landscaping upon the environment.
- (E) Maintain and increase the value of land by requiring landscaping to be incorporated into development, thus becoming by itself a valuable capital asset.
- (F) Provide direct and important physical and psychological benefits to human beings through the use of landscaping to reduce noise and glare, provide shade and cooling, and to break up the monotony and soften the harsher aspects of urban development.
- (G) Eradicate or control certain exotic plant species that have become nuisances because of their tendency to damage public and private works, to have a negative effect upon public health, or to disrupt or destroy native ecosystems.
- (H) Promote innovative and cost-conscious approaches to the design, installation, and maintenance of landscaping.
- (I) Establish procedures and standards for the administration and enforcement of this Landscaping Ordinance.

830-2. Applicability

This Landscape Ordinance shall apply to all public, private, and institutional development, with the following exceptions:

- (A) previously approved development;
- (B) development of an individual single family detached residence or single duplex on a lot of record; and

- (C) additions to nonresidential structures that are under 10% of the gross floor area or 5,000 square feet, whichever is less; and

In all other cases, whenever a site plan review is required by Chapter 815 of this Zoning Ordinance, all yard and parking areas shall be landscaped in accordance with the requirements of this chapter.

830-3. Enforcement

Wherever site plan review is required by this Zoning Ordinance, a landscape plan shall be a required part of such site plan. No permanent land use certificate or certificate of occupancy shall be issued without completion of all landscaping shown on the landscape plan required herein. Failure to implement the approved landscape plan, including preservation of existing features, or to maintain the landscaping shall be a violation of this Zoning Ordinance subject to the penalties outlined in Chapter 817.

- (A) Landscaping for commercial and industrial applications must be maintained in perpetuity, unless limited or revoked by legislation, by Plan Commission or Board of Zoning Appeals approval, or by other government action (e.g., condemnation of site) that conflicts with the maintenance requirement.
- (B) Residential landscaping must be maintained for 2 years.

830-4. Content of Landscape Plan

A landscape plan shall conform to the following requirements:

- (A) A landscape plan is required for each lot within the proposed development. It is recommended that the landscape plan be prepared by a landscape architect, nurseryman, or other professional experienced in landscape design and the installation and care of plant materials.
- (B) All landscape plans submitted for approval as a component of a required site plan shall show the entire zoning lot to scale and shall contain the following information:
 - (1) the location and dimensions of all existing and proposed structures, parking lots and drives, roadways and right-of-way, sidewalks, bicycle paths, ground signs, refuse disposal areas, bicycle parking areas, freestanding electrical equipment, recreation facilities, utility lines and easements, freestanding structural features, and other landscape improvements, such as earth berms, walls, fences, screens, sculptures, fountains, street furniture, lights, and courts or paved areas;
 - (2) the name and address of the owner, developer, and plan preparer, the date the plan was prepared, scale, and north arrow;
 - (3) the location, quantity, size, Density Value (D Value), and name--both botanical and common--of all proposed planting materials;

- (4) the location, size, and common name of existing trees and individual shrubs/perennials/grasses/ferns, areas of dense trees or shrubs, and other natural features, indicating which are to be preserved and which are to be removed;
- (5) the approximate location and generic identification of existing structures and plant materials within the yard of adjoining properties;
- (6) existing and proposed grading of the site, including proposed berming, indicating contours at not more than two-foot intervals. The planning staff may waive this requirement for situations in which grading is negligible;
- (7) specification of the type and boundaries of all proposed vegetative ground cover;
- (8) design of fences and other significant accessory structures;
- (9) the location of barriers to be placed at or beyond the drip line of any trees to be preserved, and the type of material to be used for the barrier;
- (10) planting and installation details as necessary to ensure conformance with all required standards;
- (11) details indicating specific grading measures or other protective devices where trees are to be preserved in areas of cut and fill;
- (12) a tabulation clearly displaying the relevant statistical information necessary for the Plan Commission to evaluate compliance with the provisions of this ordinance;
- (13) soil mix used for landscaped areas; and,
- (14) A plan sheet shall be provided that identifies the parking lot areas that contribute runoff to landscaped bioretention areas and that labels the amounts of both these watershed areas and of the landscaped areas.

830-5.

Preservation of Existing Features

- (A) Trees and shrubs/perennials/grasses/ferns already existing on land subject to the provisions of this chapter shall be preserved wherever feasible. Criteria for judging the feasibility of retaining existing vegetation include:
 - (1) the practicability of arranging site plan components around existing features. In general, plans for groups of structures should be designed so as to preserve tree masses, individual tree specimens, and small stands of trees or shrubs/perennials/grasses/ferns;
 - (2) the condition of the vegetation with respect to continued vitality;
 - (3) the amount of healthy vegetation the area involved will support;

- (4) the practical and economic possibility of designing the location and grades of proposed structures and paving to preserve existing vegetation;
 - (5) the desirability or lack thereof of a particular tree or species by reason of its appearance; historic or ecological significance; botanical characteristics; and the function the vegetation would fulfill as a site plan component;
 - (6) the potential for interference with utility services or with passage or visibility along roads or walkways; and,
 - (7) the possibility of preserving the vegetation while meeting the development needs through pruning rather than removal.
- (B) Existing trees at least 2 inch caliper within the Bufferyard that are preserved will contribute to 100 required Density Value (D Value) at the rate of 35D for every three inches of caliper except on lots under one (1) acre, where the maximum D value awarded shall be 100. Existing trees/shrubs/perennials/grasses/ferns within the perimeter parking lot or streetscape will be evaluated in the same manner as new shrubs/perennials/grasses/ferns based on the species.
- (C) Existing vegetation outside of buffer yards shall be preserved and credited toward the required landscaping. Vegetation shall be credited as follows:
- (1) Deciduous Trees: A credit of 1 tree per every 4 inches in caliper of an existing qualified tree per 830-5(A) is earned. No single existing tree shall count towards more than 3 required trees.
 - (2) Evergreen Trees: A credit of 1 tree per every 12 feet in height of an existing qualified tree per 830-5(A) is earned. No single existing tree shall counts towards more than 3 individual trees.
 - (3) Shrubs: A credit of 1 shrub per every 1 existing qualified shrub per 830-5(A) is earned.
- (D) Substantial barriers shall be specified on the Landscape Plan and shall be placed at or beyond the drip line of trees to be protected. These barriers shall remain in place during heavy construction on the site, and no vehicle, machinery, tools, chemicals, construction materials, or temporary soil deposits may be permitted within the barriers, nor may any notice or other object be nailed or stapled to protected trees.
- (E) Where trees are to be preserved in areas of cut or fill, specific grading measures or other protective devices, such as tree wells, tree walls, or specialized fill and pavement designs shall be required and shall be fully detailed on the Landscape Plan.

General Landscaping Requirements

All land areas that are not covered with buildings and pavement or used for agricultural purposes shall be appropriately landscaped in accordance with the requirements of this Chapter. Landscaping shall be provided in the areas specified and of the minimum number or intensity, expressed in D Value, specified below.

- (A) The tables of materials included in this chapter provide measures of landscaping intensity, expressed as Density Value (D Value) for bufferyards or number of species, as a means of establishing compliance with these regulations. When plant materials listed in the table are used for bufferyards, they will be assigned the D Value specified in section 830-14. The Administer may be petitioned to include Plant materials not listed. Once approved, plant materials not listed will be assigned a D Value based on height, spread, and/or crown at maturity, using the best available resources to determine mature characteristics. A landscape architect, nurseryman, or other professional experienced in the installation and care of plant materials should be consulted to ensure that the plants proposed are appropriate and will survive.
- (B) Where front and rear yards overlap side yards, the yard shall be treated as part of the yard having the greater required number of plants or D Value.
- (C) The scale and nature of landscape materials shall be appropriate to the size of the structures and the available space. Growth characteristics should be considered. Materials shall be located to avoid interference with overhead and underground utilities and utility easements or vehicular or pedestrian movement and visibility.
- (D) Plant material shall be selected to achieve an intended purpose such as pollution filtration, control storm water runoff, shading, screening, wildlife habitat, ornamentation, etc.
- (E) Trees shall be planted to maintain a minimum five foot clearance between the tree trunk and structures, building overhangs, walls, fences, property lines, and other trees.
- (F) Plantings should be arranged to promote energy conservation according to LEED standards; e.g. use of tall deciduous trees on the south and west sides of buildings to provide shade from the summer sun and planting evergreens on the north of buildings to dissipate the effect of winter winds.
- (G) All trash dumpsters, trash pads, loading areas consisting of two or more loading spaces, loading docks, and service and maintenance areas shall be screened from land in a residential zone and all adjacent public roads. Screening may be achieved by using a six foot high, completely opaque fence or wall, a six foot high berm, or a six foot high evergreen screen planted nine feet on center in a double staggered row.
- (H) Ground-mounted heating and cooling units for nonresidential structures shall be adequately screened so as not to be visible from streets and/or adjacent properties.

- (I)** Native wildflowers, grasses and other vegetative ground cover shall be used for all open space, including parking lot islands, except for:

 - (1)** decorative mulch planting beds extending no more than 6 inches beyond the drip line of shrubbery and a 6 foot diameter surrounding trees, and
 - (2)** inert stabilization in areas subject to severe runoff, erosion, or ponding. Where stone or other inert materials are to be used for ground cover, they shall be specifically identified on the landscape plan. Any area not so designated shall be required to have grass or vegetative ground cover.
- (J)** All landscaping shall conform to the regulations established for visibility triangles to maintain safe sight distances and intersections and points of access as designated in section 804-3.
- (K)** Except as provided in 830-6 (L) and 830-10(B)(6) below, all landscape areas shall be separated from parking lot areas by reinforced concrete curbing. Unreinforced extruded curbing shall be prohibited. The width of curbing shall be excluded from the calculation of the minimum dimensions of all required landscape areas.
- (L)** All landscaped areas at the front line of off-street parking spaces shall be protected from encroachment or intrusion of vehicles through the use of wheel stops. Wheel stops shall have a minimum height of six inches above the finish surface of the parking area, be properly anchored and continuously maintained in good condition. Wheel stops shall not be placed in locations of anticipated intense pedestrian traffic.
- (M)** Minimum open space shall be as required by the Zoning Ordinance Height, Bulk, Area, and Density Provisions chapter.
- (N)** Maximum number of one particular species can not constitute more than 20% of the required D value or species count for each category.
- (O)** Professional landscape design is encouraged to fulfill the landscaping requirements of this chapter. Required plantings can be arranged according to design elements and site characteristics (i.e. wet soils, part shade etc.). Informal and natural plant arrangements are encouraged.
- (P)** Soils in landscaped areas must be a minimum 18 inch depth of a mix appropriate for the plantings and drainage conditions.
- (Q)** All traditionally landscaped areas must be mulched with hardwood at a depth appropriate to the plantings.

830-7.

Bufferyard Landscaping Requirements

- (A)** The following bufferyard requirements are intended to physically separate and visually screen adjacent land uses that are not fully compatible.
- (B)** To determine the required size of the buffer, two variables are considered: the nature of the adjacent use and the amount of required vegetation.

 - (1)** Use Table 30-1 to determine the buffer type required for the situation. The table assigns a minimum bufferyard to each potential development scenario. If the adjoining property has a mix of land uses, the highest intensity of use determines the bufferyard's required size.
 - (2)** After determining the bufferyard type, refer to Table 30-2 which enumerates the physical design requirements of each bufferyard. At least 45% of the D Value must be shade trees.

- (C)** If woodlands are located within the minimum landscaped yard, preservation may be applied toward the planting requirement. If existing woodlands are located in only part of the minimum landscaped yard, the D Value requirement is proportionately reduced.
- (D)** A six foot high opaque fence or wall may be located within the bufferyard reducing the required D Value by 50%.
- (E)** The bufferyard should incorporate bioretention where deemed appropriate by the Drainage Engineer; see 830-10 for specifications. Details to utilize bioretention can be coordinated with the County Drainage Engineer and the Administrator. Use of bioretention may reduce other storm water requirements on the site.

Table 30-1 Minimum Required Bufferyard							
ADJOINING USES							
P R O P O S E D U S E		Single Family Dwelling	Two Family Dwelling	Multi Family Dwelling	Low Intensity Use	Medium Intensity Use	High Intensity Use
	Single Family Dwelling	None	A*	B*	C*	C*	D*
	Two Family Dwelling	A	None	A*	B*	C*	D*
	Multi Family Dwelling	B	A	None	B*	B*	D*
	Low Intensity Use	C	B	B	None	A*	C*
	Medium Intensity Use	C	C	B	A	None	B*
	High Intensity Use	D	D	D	C	B	None
* The maximum buffer that may be required.							

Table 30-2 Bufferyard Types		
Type	Minimum Landscaped Yard	D Value Required per 100 Linear Feet of Property Line or Right-of-Way*
A	10 feet	105
B	10 feet	210
C	15 feet	315
D	20 feet	420
* Linear does not mean all plantings have to be arranged in a linear fashion, natural groupings are encouraged.		

830-8.

Parking Lot Landscaping Requirements

The following landscape requirements applied to parking lots are intended to provide natural filtration for storm water, screen parking areas from the street, prevent large expanses of unbroken paving, and provide shade to cool paved areas during the hot summer months. The requirements are established for three areas: along the public right-of-way, along the parking lot's perimeter, and in the lot's interior.

To provide filtration, landscaped areas for parking lots shall include bioretention facilities sized and constructed to temporarily store an amount of runoff referred to as the "water quality volume" or "first flush volume" from the entire parking lot. Water quality volume is the storage volume necessary to serve at least one-half inch of runoff over the drainage area to be served by the bioretention facility. See Section 830-10 for specifications. A plan sheet shall be provided that identifies the parking lot areas that contribute runoff to landscaped bioretention areas and that labels the amounts of both these watershed areas and of the landscaped areas.

If the water quality volume requirement is satisfied by existing vegetation, the need for a new bioretention facility may be waived by the Administrator pursuant to Section 12. If the site only partially receives drainage, then only the area that receives the drainage need be designed with bioretention.

(A) Landscaping Along the Right-of-Way

Landscape strips shield views of parked cars to passing motorists and pedestrians, and may establish coordination among architecturally diverse buildings. To provide flexible standards that reflect site constraints and opportunities, three options are available to meet the landscaped strip requirements.

(1) Parking Lot Landscaped Strip, Option 1

Provide a minimum ten-foot wide strip between a right-of-way and the parking lot, planted with a minimum of 1 tree, 10 shrubs, and 10 shrubs/perennials/grasses/ferns for every 35 lineal feet of street frontage, excluding driveway openings. Groupings of plant materials shall be mulched.

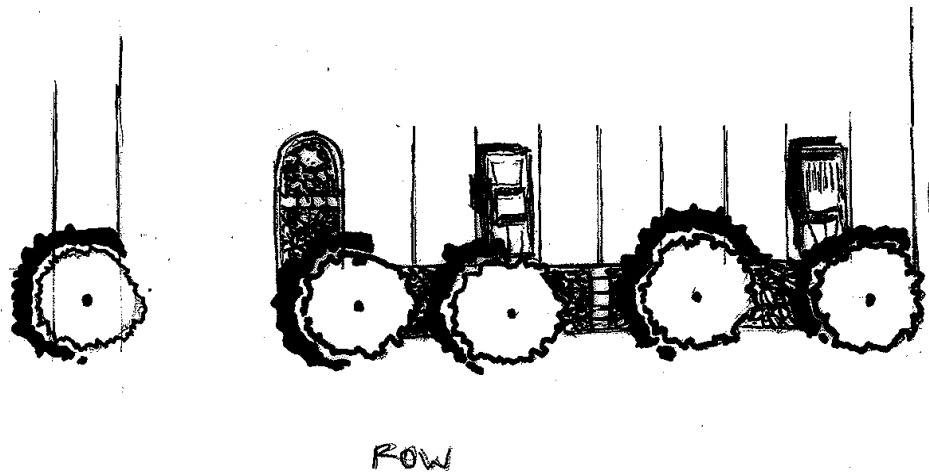


Figure 30-1 Parking Lot Landscaped Strip, Option 1

(2) Parking Lot Landscaped Strip, Option 2

Provide a berm at least 2.5 feet higher than the finished elevation of the parking lot. The berm shall have a minimum side slope of 3:1 and a minimum crown width of two feet. Live vegetation must cover the berm with a minimum of 1 tree, 7 shrubs, and 8 shrubs/perennials/grasses/ferns for every 35 lineal feet of street frontage, excluding driveway openings. Groupings of plant materials shall be mulched.

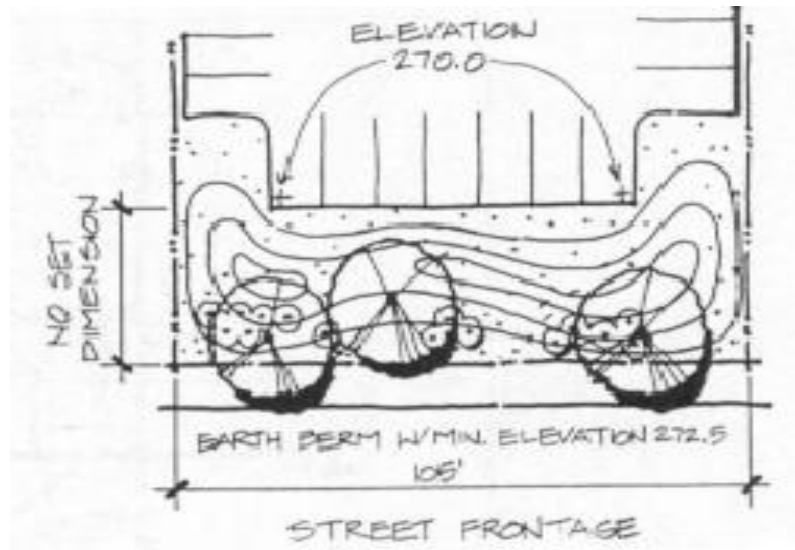


Figure 30-2 Parking Lot Landscaped Strip, Option 2

(3) Parking Lot Landscaping Strip, Option 3

Preserve a minimum 25 foot wide strip of existing woodlands in lieu of the landscaping requirement.

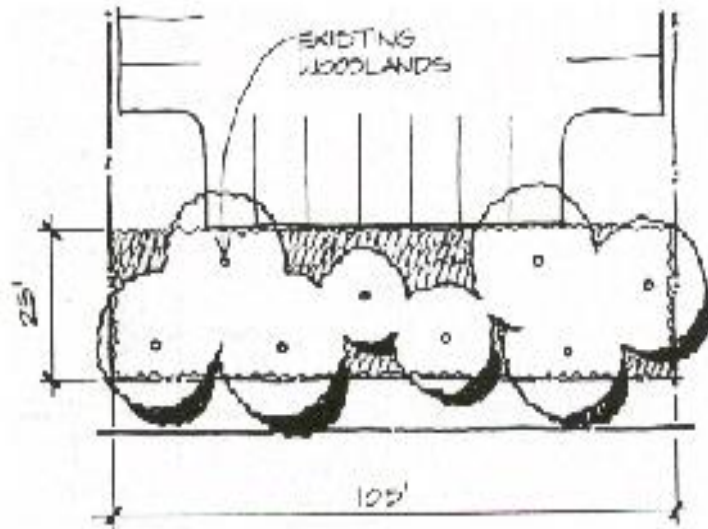


Figure 30-3 Parking Lot Landscaped Strip, Option 3

(B) Perimeter Landscaping

Perimeter landscaping is required to treat storm water through improved filtration, sedimentation, and biological processes. In addition, perimeter landscaping defines parking areas and prevents two adjacent lots from becoming one large expanse of paving. The required perimeter landscaping between adjacent lots does not preclude the need to provide vehicular access between the lots.

- (1) Figure 30-4 illustrates the required perimeter landscape strip. The landscape strip must be a minimum of 5 feet wide.

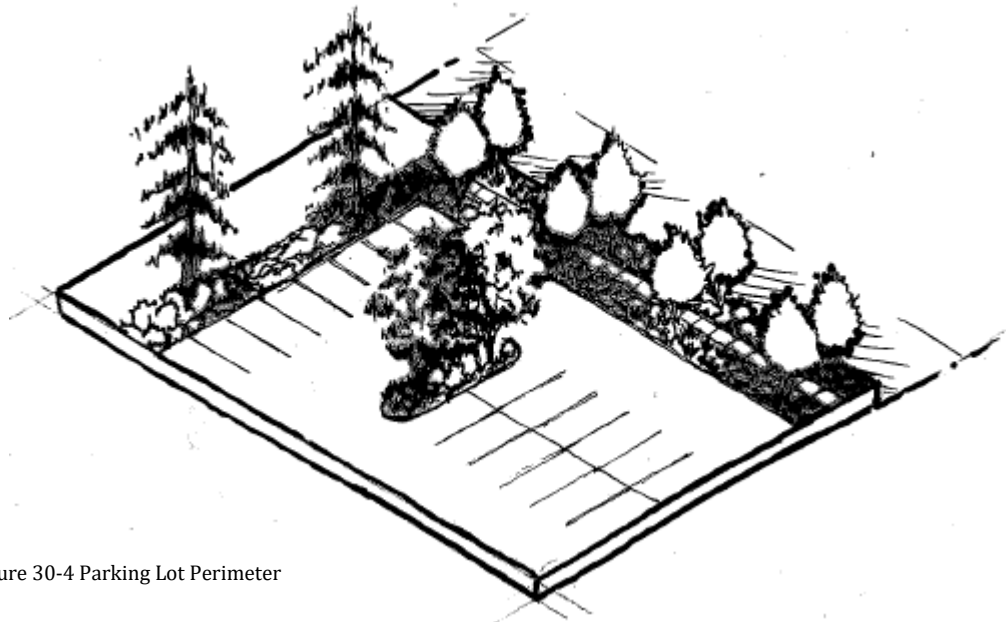


Figure 30-4 Parking Lot Perimeter

- (2) 1 tree, 10 shrubs, and 10 shrubs/perennials/grasses/ferns are required for every 35 lineal feet around the parking lot area excluding vehicular access aisles.
- (3) The applicant may preserve existing woodlands at least 25 feet in width in lieu of the above perimeter landscaping requirements.

(C) Interior Landscaping

Interior parking lot landscaping requirements are required for all parking. Figure 30-5 illustrates how to calculate the required interior lot planting. All areas within the lots perimeter are counted, including planting islands, curbed areas, corner lots, parking spaces, and all interior driveways and aisles. Only driveways and aisles with no parking spaces located on either side are excluded from the interior area calculation.

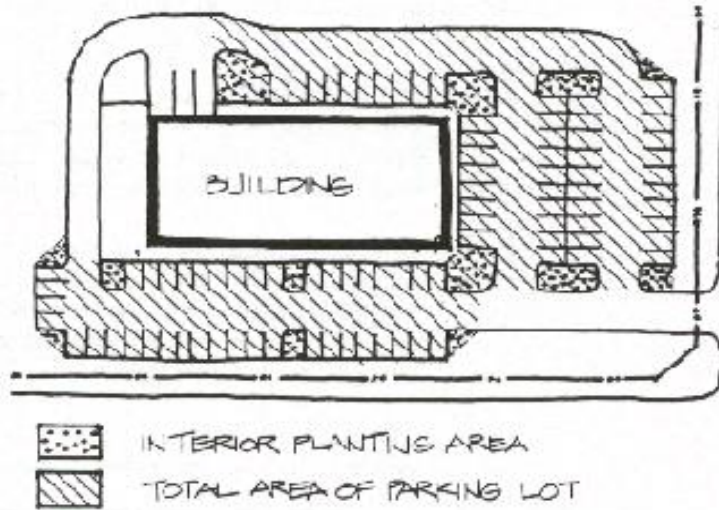


Figure 30-5 Parking Lot Interior Calculations

- (1) In recognition that larger lots have greater visual and environmental impact than smaller lots, a sliding scale is used to determine the required amount of landscaping. The required landscaping is designated on Table 30-3.

Table 30-3 Required Interior Planting Area of Parking Lots	
Total Area of Parking Lot	Percent of the Total Area of Lot that Must be an Interior Planting Area
0 to 49,999 sq. ft.	5%
50,000 to 149,999 sq ft	8%
150,000 sq. ft. or larger	10%

- (2) Landscaped areas outside the parking lot may not be used to meet the interior planting requirement.
- (3) All rows of parking spaces shall be provided a terminal island of at least 162 square feet of area to protect parked vehicles, provide visibility, confine moving traffic to aisles and driveways, and provide space for landscaping.
- (4) Landscaped islands of at least 162 square feet of area shall be provided every 10 spaces or less within a row of spaces for residential sites and every 15 spaces or less within a row of spaces for commercial developments. Planting islands should be evenly spaced throughout the parking lot to consistently reduce the visual impact of long rows of parked cars. Islands shall be utilized where needed to control vehicular circulation and define major drives. Landscape strips between two facing parking aisles can also be used to meet the interior planting requirement.
- (5) Landscaped islands of at least 162 square feet are required to have 1 tree, 10 shrubs, and 10 shrubs/perennials/grasses/ferns. Each additional 10 square feet shall require 1 additional shrub and 1 shrubs/perennials/grasses/ferns. Trees must have a clear trunk at least six feet above the finished grade to allow for visibility and vehicular circulation beneath the tree canopy.
- (6) Landscape strips between two facing parking isles shall be a minimum of 5 feet wide. 1 tree, 10 shrubs, and 10 shrubs/perennials/grasses/ferns are required every 35 lineal feet.
- (7) To prevent cars from parking too close to trees or damaging shrubs, a curb or wheel stop must be provided. Planting islands parallel to parking spaces must be a minimum of five feet wide to allow car doors to swing open.

Commercial and Industrial Streetscapes

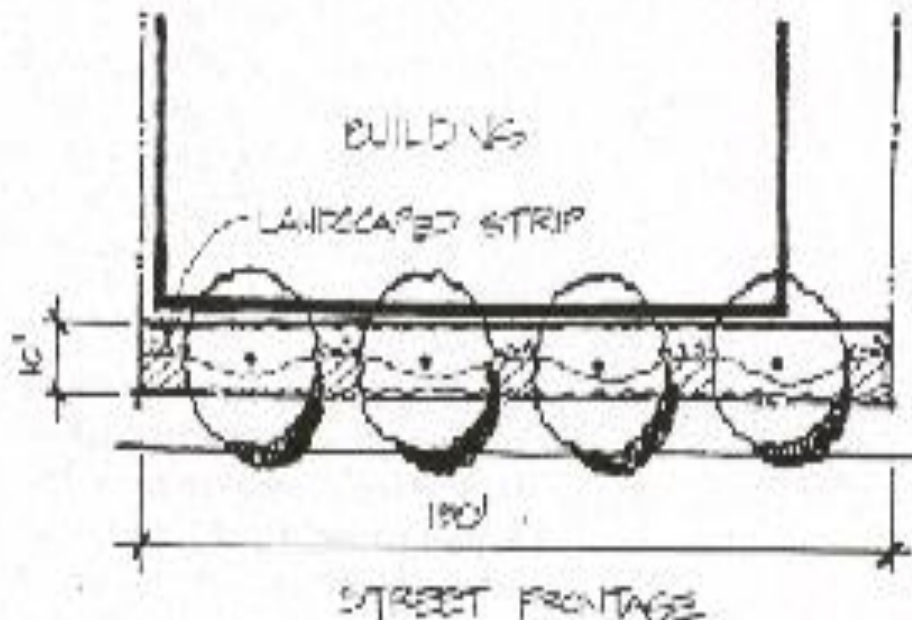
The following landscape strip requirements apply to all commercial and industrial zones and all nonresidential uses within a residential zone. The strip must be located on the property, adjacent to the public right-of-way, and may not include paved surfaces, with the exception of driveway openings and pedestrian sidewalks or trails that cross the strip. The streetscape may not be required when land is abutting or adjoining a bridge or overpass, or would not be visible from the right-of-way or would not otherwise meet the safety and aesthetic objectives of the requirement. An applicant whose property is impacted by this condition may apply to the Administrator for an administrative waiver from the Streetscape provision.

For all impervious areas that slope towards the streetscape, the associated landscaped area shall be designed as a bioretention area sufficiently sized and constructed to serve the water quality volume requirement of Section 8. Traditional options can only be used where drainage is not received (unless woodlands are being preserved). There are 3 traditional streetscape options available to meet the landscaped strip requirements.

(A) Traditional Streetscape Options (site does not receive drainage):**(1) Commercial and Industrial Landscaped Strip, Option 1**

Provide a minimum 5 foot wide strip between a right-of-way and the parking lot, planted with a minimum of 1 tree, 10 shrubs, and 10 shrubs/perennials/grasses/ferns for every 35 lineal feet of street frontage, excluding driveway openings.

Groupings of plant materials shall be mulched. Required streetscape landscaping shall be reasonably distributed throughout all landscaped areas. It is suggested that the required plantings be planted in clusters or irregular patterns.



(2) **Commercial and Industrial Landscaped Strip, Option 2**

Provide a landscape strip a minimum of 5 feet wide and maximum of 20 feet wide and an average width of 10 feet strip adjacent to the public right-of-way, planted with a minimum of 1 shade tree, 10 shrubs, and 10 shrubs/perennials/grasses/ ferns for every 35 lineal feet of street frontage, excluding driveway openings.

Groupings of plant materials shall be mulched. Required streetscape landscaping shall be reasonably distributed throughout all landscaped areas. It is suggested that the required plantings be planted in clusters or irregular patterns.

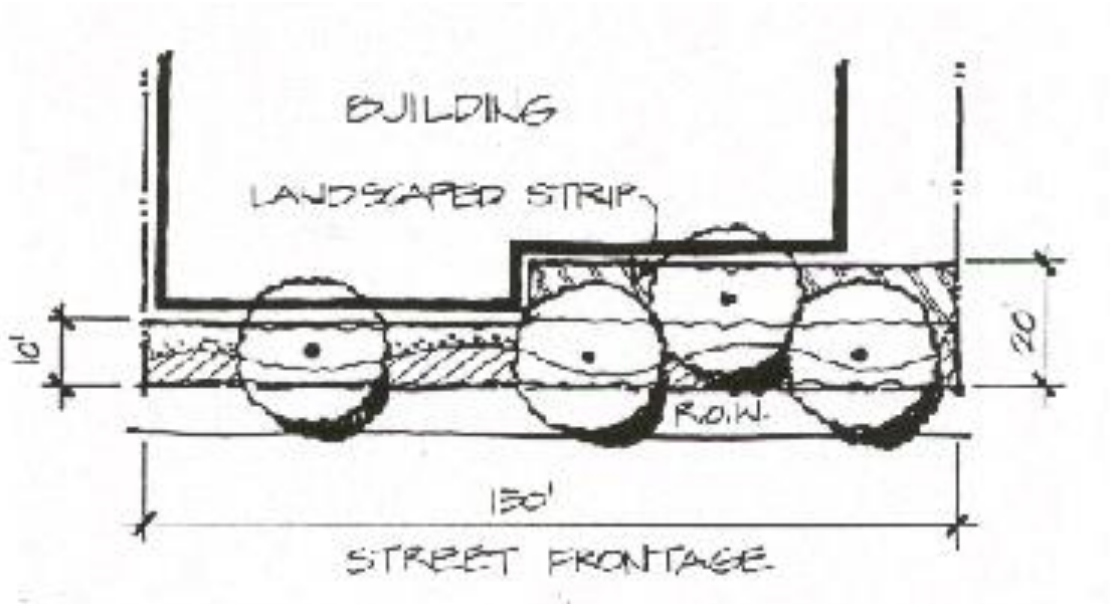


Figure 30-7 Commercial and Industrial Landscaped Strip, Option 2

- (3) **Commercial and Industrial Landscaped Strip, Option 3**
Preserve a 25 foot wide strip of existing woodlands in lieu of the landscaping requirement.

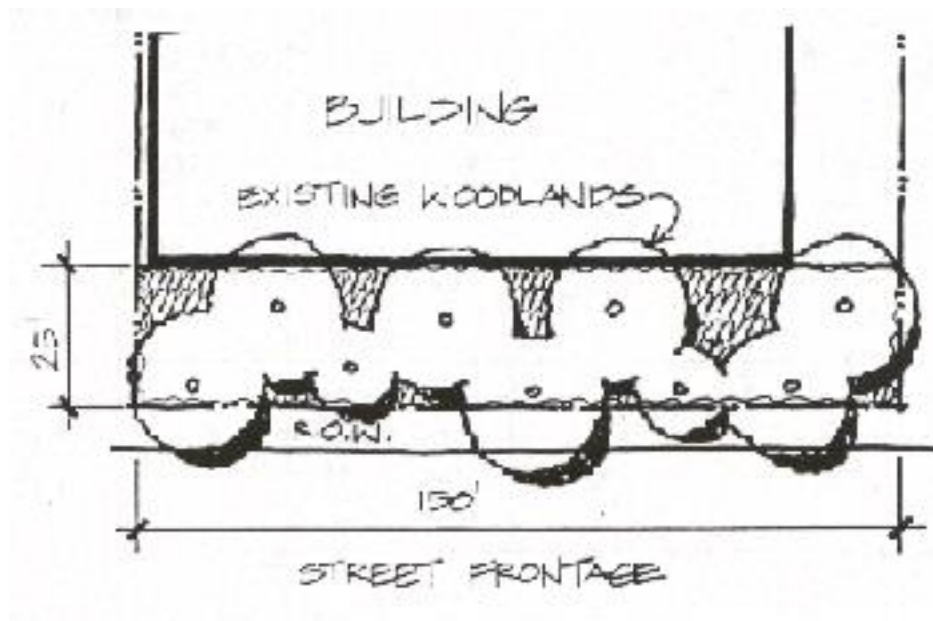


Figure 30-8 Commercial and Industrial Landscaped Strip, Option 3

830-10. Bioretention Design

Bioretention design and associated landscaping combines drainage and landscaping on a site for the purposes of naturally cleaning storm water with native plants. Bioretention reduces non-point source pollution thereby contributing to a healthier watershed and cleaner drinking water. Details of the required bioretention design should be coordinated with the County Drainage Engineer and the Planning Administrator.

Bioretention design is required for each parking lot requirement (along the right-of-way, perimeter, and interior) and streetscape requirements where the site will receive drainage. General specifications and sizing examples are given below. Examples are shown in Figures 30-9 through Figure 30-12. Bioretention required plantings supersede other parking lot and streetscape requirements.

(A) Required Values

Provide an average of at least 1 tree, 4 shrubs or small trees, 120 ferns, grasses, sedges, and perennials (with a minimum use of 20% of ferns, grasses, or sedges, and 20% perennials) per 300 square feet of bioretention area exclusive of filter strips. For landscape islands containing less than 300 square feet, use no large trees and at least 1 small tree along with shrubs or small trees, ferns, grasses, sedges, and perennials at the densities prescribed above. See Tables 30-12 through 30-15 for recommended bioretention plants.

For landscape bioretention areas that are larger than required in Chapter 830, turf grass or other suitable stabilization shall be allowed for the excess landscaped area.

(B) Bioretention Specifications

- (1)** *Filter Strips.* Two foot wide turf grass filter strips shall be placed between impervious surfaces and some bioretention areas (see Figures 30-9 through 30-12) to provide stable side slopes, to filter particulates, and to provide a mow strip between the other landscape plants and the pavement. The filter strips shall be used only in bioretention areas that are at least 10 feet wide and that contain at least 300 square feet in area.
- (2)** *Ponding Area.* Ponding depth during rain events when overflow begins must range from one to six inches over at least 80% of the bioretention area to encourage complete saturation of the underlying soil mix. Three inches well aged hardwood mulch, decorative stone, or a combination shall be used in all beds.
- (3)** *Overflow practices* are required to prevent more than one inch of flooding in parking areas during rain events.
- (4)** *Soil Amendments.* Soil mix shall be 50% compost, 25% sand, and 25%

top soil. Minimum depth of amended soil shall be 18 inches but will vary with desired capacity. Soil shall be backfilled only after the watershed draining to it has been stabilized. Purpose is for storm water storage and filtration, to absorb pollutants, and facilitate nutrient uptake by plants.

- (5) *Underdrain and Stone bed.* Underdrains bedded in and covered with pea gravel shall be provided so that water does not pond on the surface of the bioretention filter area longer than 12 hours following the end of a rainfall event. All stone should be washed and open graded and provide at least 12 inches of capacity underneath the underdrain (e.g. the underdrain should not be placed at the bottom of the system). The maximum size for an underdrain pipe shall be 4 inches in diameter
- (6) *Edging and Wheel Stops.* All landscape areas incorporating bioretention shall be separated from parking lot areas by either reinforced concrete curbing (with openings for drainage) or by wheel stops (with openings for drainage). Where concrete curbing is not used, reinforced concrete edge strips that are a minimum of 6 inches wide, 12 inches deep and flush with the parking lot surface are required.

(C) Bioretention Sizing

Within the bioretention area, the water quality volume may be met by a combination of temporarily ponded water, the water absorbing capacity of the amended soil (20% of the dry soil volume), and the void volume of any stone that will be saturated (25% of the stone volume). There are two sizing options:

- (1) To convert the one-half inch runoff requirement to the corresponding water quality volume requirement (in cubic feet), divide the area draining to the Bioretention filter area (in square feet) by 24.
 - For example, one-half inch of water from a 1000 square foot parking area that drains to a Bioretention filter area corresponds to 41.7 cubic feet of water ($1000/24=41.7$). The bioretention area must therefore be able to contain 41.7 cubic feet of water, through a combination of water ponded on the surface, within the amended soil zone, and within an underlying crushed stone layer.
 - Twenty percent of the soil volume can be counted as water volume, and twenty-five percent of the crushed stone volume can be counted towards the required water volume. For example, in 160 cubic feet of amended soil, 0.2×160 cubic feet = 32 cubic feet of water can be stored. In 15 cubic feet of crushed stone, 0.25×15 cubic feet = 3.75 cubic feet of water can be stored. A bioretention area with 160 cubic feet of amended soil underlain by 15 cubic feet of stone can therefore hold 32 cubic feet + 3.75 cubic feet = 35.75 cubic feet of water. For the 1000 square foot parking lot example, the amount of water required to be ponded on the surface of the bioretention area would be 47.1 cubic feet – 35.75 cubic feet = 11.35 cubic feet. These required volumes can be provided in a bioretention area with 80 square feet of area if the amended soil depth is two feet, the underlying stone layer is two inches deep, and the depth of water ponded on the surface is one inch.”

(2) Size the Bioretention filter area to equal 10% of the area of impervious surface draining to it.

(D) Examples of Bioretention used to fulfill the landscaping requirements



Figure 30-9 Parking Lot Landscaped Strip
Bioretention for parking lot perimeter or between rows of parking spaces.

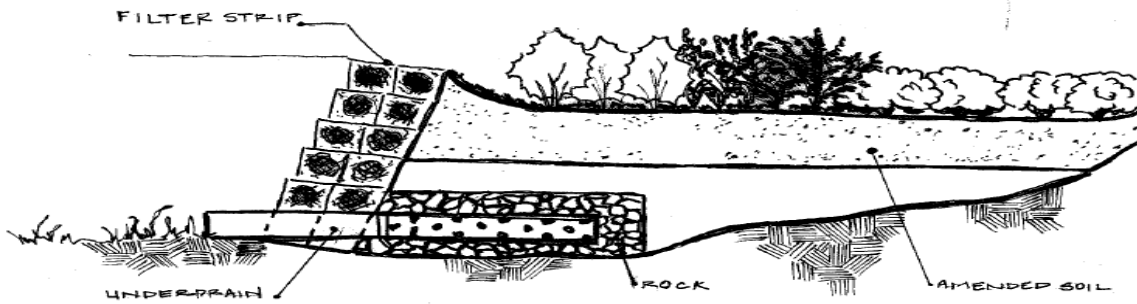


Figure 30-10 Parking Lot Interior and Island Plantings
Bioretention filter strips for parking interiors

Revised 5/5/21

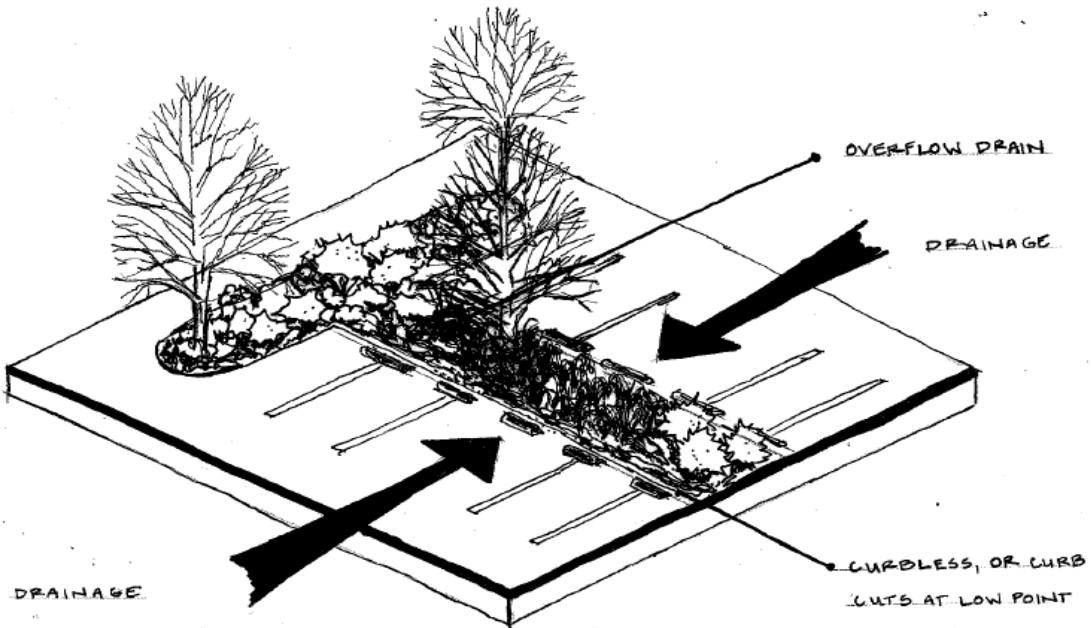
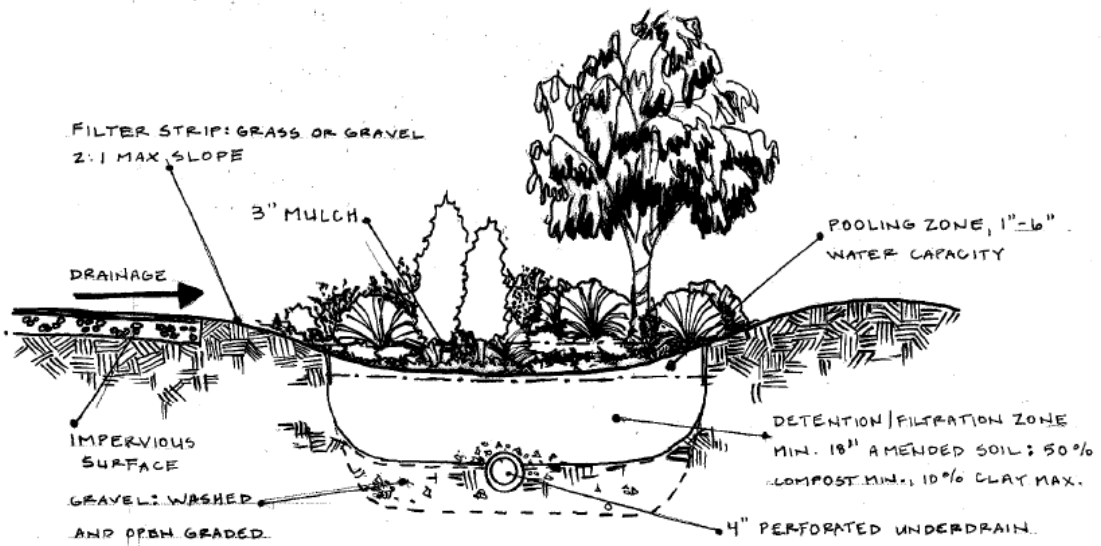


Figure 30-11 Parking Lot Interior and Island Plantings
Bioretention filter strips for parking lot interiors



830-11.

Residential Landscaping

All residential developments, shall meet the following requirements for minimum planting and buffering of rear yards from minor collector streets or higher road classifications.

- (A) Trees in residential subdivisions are to be grouped together to simulate natural tree stands.
- (B) Yards, setbacks, and other open space areas within residential developments shall be landscaped with live vegetation having a D Value of 800 per net acre of development site, but not less than 300 per development site. The minimum number of trees to be planted on each lot is a function of the lot size or number of dwellings. Table 30-4 specifies the minimum tree requirements.

Table 30-4 On-Site Residential Planting Requirements		
Residential Type	Minimum Number of Trees	Notes
Single Family Dwelling Developments	2 per lot	Plant in yards, setbacks, and open spaces.
Two Family Dwelling Developments	2 per dwelling	Total number of trees to be located on lots and in common open space
Multifamily Dwelling Developments	2 per 1,600 sq. ft. or fraction of green area	Plant in yards, setbacks, and open spaces.

- (C) When determining the amount of trees required for multifamily dwellings, the following features are not included in the landscape area calculation: lakes and other water features, required parking lot landscaping along a right-of-way, and interior parking lot landscape areas. Figure 30-13 illustrates this calculation.
- (D) Trees fulfilling the perimeter bufferyard requirements may be counted toward the minimum planting requirements. Existing trees and woodlands may also fulfill part or all of the minimum planting requirements. The trees must exceed 2.5 inches in diameter and must be located on an individual lot within 75 feet of a

dwelling unit. Existing trees that exceed 2.5 inches in diameter and that are located anywhere in the landscape area may fulfill the requirement for trees for multifamily dwellings. For any subdivision, existing trees larger than 2.5 inches in diameter located on an individual or common green may fulfill part of all or the tree requirement for that site.

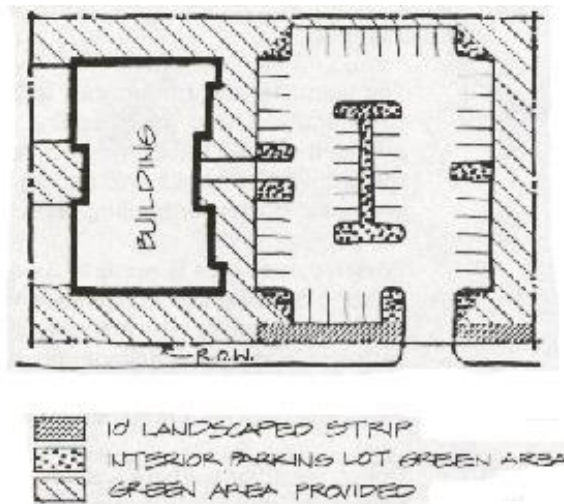


Figure 30-13 Multifamily Dwelling Landscape Area Calculations

- (E) Where the rear of a two-family or multi-family dwelling unit faces a public street, The tract or lot must be screened with plant material at least five feet high. A fence, wall, or berm, in addition to plantings, may also be permitted subject to the approval of the Administrator.
- (F) The rear yard and the lowest story of the rear outside wall of any single family dwelling must be screened from the view of any street classified as a collector or arterial. The buffer is required either on individual lots or as part of the common open space owned and maintained by a homeowners association. The required buffer area width and plants are as follows:
 - (1) *Collector.* A minimum of 35 feet wide with four deciduous trees, 15 evergreen trees, and 30 shrubs/perennials/grasses/ferns per 3,500 square feet of right-of-way (a minimum D Value of 850 points per 3,500 square feet).
 - (2) *Arterial.* A minimum of 50 feet wide with six deciduous trees, 18 evergreen trees, and 40 shrubs/perennials/grasses/ferns per 5,000 square feet of right-of-way (a minimum D Value of 1000 points per 5,000 square feet).
- (G) If existing woodlands are located entirely in the buffer area, preserving the trees may satisfy all plant requirements. If existing woodlands are partially located within the buffer area, the number of deciduous trees, evergreen trees, and shrubs/perennials/grasses/ferns may be proportionately reduced.

830-12.

Modifications

- (A)** The Administrator, in consultation with the County Drainage Engineer, may approve any landscape proposal s/he deems to be equivalent to the foregoing minimum requirements. Except as provided in 830-11 (B), no such approval shall have the effect of reducing the required setbacks or reducing required D Value for any particular setbacks, buffer, or parking area.
- (B)** Where compliance is required as a result of change in use or expansion of an existing building and compliance with this section will necessitate removal of existing pavement, the planning staff may approve a reduction of parking lot setbacks and other minimum planting areas provided that proposed plantings, screens, and other landscape features are the equivalent to the foregoing minimum requirements in terms of D Value.
- (C)** Under conditions where a strict interpretation of requirements may be either physically impossible or create practical difficulties, an alternative compliance procedure may be used to maintain the spirit--rather than the letter--of the law. The proposed solution must equal or exceed existing requirements. Requests for use of alternative landscaping schemes are justified only when one or more of the following conditions apply:

 - (1)** The sites involve space limitations or unusually shaped parcels;
 - (2)** Topography, soil, vegetation, or other site conditions are such that full compliance is impossible or impractical;
 - (3)** Because of a change in use of an existing site, the required bufferyard is larger than can be provided; and
 - (4)** Safety considerations are involved.

The applicant must provide a justification statement that describes which of the requirements established by the Landscaping Ordinance will be met with modifications, which project conditions justify using alternatives, and how the proposed measures equal or exceed normal compliance. Planning staff will review the alternative compliance application and recommend approval, approval with conditions, or disapproval of the proposal to the planning Administrator. The planning Administrator will make the final decision. Appeals of the decision may be taken to the Board of Zoning Appeals.

- (D)** Occasionally, plant substitutions for species specified on approved landscape plans are required due to seasonal planting problems and a lack of plant availability. Minor revisions to planting plans can be approved in a simple over-the-counter process by the Administrator if there is no reduction in the quantity of plant material or no significant change in size or location of plant materials, and if the new plants are of the same general category and have the same general design characteristics as the materials being replaced. Proposed materials must also be compatible with the microclimate of the site to ensure

healthy plant growth. If the plant substitutions do not fulfill these criteria, then changes to the approved plans must be resubmitted and reviewed for new approval.

- (E) Rain gardens are encouraged and can be substituted to meet some of the required landscaping elements. Details of the Rain Garden can be coordinated with the County Drainage Engineer and approved by the Administrator.

830-13. Installation and Maintenance

- (A) Plant materials shall conform to the requirements described in the latest edition of the American Standard for Nursery Stock, which is published by the American Association of Nurserymen. Plants shall be nursery grown.
- (B) Plants shall conform to the measurements specified below.
 - (1) Diameter measurements in inches shall be taken 6 inches above grade for sizes up to 4 inch caliper and 12 inches above grade for sizes above 4 inch caliper. Multi-stem or clump trees of equivalent size shall be allowed.
 - (2) Minimum size for trees (including small trees) shall be 2 inches in diameter.
 - (3) Evergreen trees shall be at least 6 feet in height at installation.
 - (4) Minimum size for shrubs shall be 3 gallon.
 - (5) Minimum size for perennials, grasses, ferns, and endangered shall be plug size (minimum 2 inches X 3 inches).
- (C) It is recommended that a professional horticulturalist//landscape architect/landscape designer should be consulted to determine the proper time to move and install plant material so that stress to the plant is minimized. Planting of deciduous material may be continued during the winter months provided there is no frost in the ground and frost-free topsoil planting mixtures are used.
- (D) After cultivation, all plant materials shall be mulched with a two to three inch layer of shredded bark, peat moss, or another suitable material over the entire area of the bed or saucer.
- (E) The owner of the premises shall be responsible for the maintenance, repair, and replacement of all landscaping materials on the premises.
- (F) All landscape areas shall be kept free of refuse and debris. Fences, walls, and other barriers shall be maintained in good repair.
- (G) It is the responsibility of each private property owner to remove any dead, diseased, or dangerous trees or shrubs, or parts thereof, which overhang or interfere with traffic control devices, public sidewalks, rights-of-way, or property owned by the County. The County shall have the authority to order the removal

of any such trees or shrubs.

830-14. D Values

- (A) Trees (Tables 30-5 and 30-6) are worth 35 D points each
- (B) Shrubs (Table 30-7) are worth 8 D points each
- (C) Perennials (Table 30-8), ferns (Table 30-10), and grasses (Table 30-9) are worth 5D points each
- (D) Endangered species (Table 830-11) are worth 10 D points each

830-15. Tables of Permitted Plant Materials

- (A) The following tables (Tables 30-5 through 30-15) list the permitted plant materials by botanic and common names. A professional landscape architect/designer should be consulted for plant selection according to site characteristics and drainage.

Cultivars of native species are allowed for all of the plant lists, but their use shall not exceed 50% of the required plantings.

- (B) The types of trees proposed and used to fulfill the streetscape requirements or the landscaping along the right-of-way requirements must be listed in Table 30-5. Tree types proposed to meet all other requirements must be listed in either Table 30-5 or Table 30-6.
- (C) Recommended bioretention plant materials are provided in Tables 30-12 through 30-15. These plants were chosen for their suitability in establishing a diverse, dense plant cover to treat stormwater runoff.

Table 30-5

Trees Suitable for Planting along Public Streets and Highways and in Locations Where Low Maintenance and Hardy Specimens are required. Trees can also be planted as a part of the Interior Landscape where appropriate.

Table 30-5: Street Trees	
Botanic Name	Common Name
<i>Acer nigrum</i>	Black Maple
<i>Acer rubrum</i>	Red Maple
<i>Acer saccharum</i>	Sugar Maple
<i>Acer x freemanii</i>	Freeman Maple
<i>Aesculus hippocastanum</i>	Horse Chestnut
<i>Carpinus caroliniana</i>	American Hornbeam
<i>Gleditsia tricanthos v. inermis</i>	Honeylocust
<i>Ilex opaca</i>	American Holly
<i>Juniperus silicicola</i>	Southern Redcedar
<i>Juniperus virginiana</i>	Eastern Redcedar
<i>Liquidambar styraciflura</i>	Sweet Gum
<i>Liriodendron tulipifera</i>	Tulip Tree/Yellow-Poplar
<i>Magnolia acuminata</i>	Cucumber Tree
<i>Malus spp.</i>	Crabapple
<i>Nyssa sylvatica</i>	Blackgum/Black Tupelo
<i>Platanus occidentalis</i>	Sycamore
<i>Quercus bicolor</i>	Swamp White Oak
<i>Quercus coccinea</i>	Scarlet Oak
<i>Quercus imbricaria</i>	Shingle Oak
<i>Quercus macrocarpa</i>	Bur Oak
<i>Quercus palustris</i>	Pin Oak
<i>Quercus phellos</i>	Willow Oak
<i>Quercus rubra</i>	Northern Red Oak
<i>Quercus shumardii</i>	Shumard Oak
<i>Sassafras albidum</i>	Sassafras
<i>Taxodium distichum</i>	Bald Cypress

Table 30-6
Trees Acceptable for Use within the Interior of a Site

Table 30-6: Interior Trees	
Botanic Name	Common Name
<i>Aesculus glabra</i>	Ohio buckeye/Horse chestnut
<i>Betula alleghaniensis</i>	Yellow birch
<i>Betula nigra</i>	River birch
<i>Cercis canadensis</i>	Eastern redbud
<i>Carya alba (tomentosa)</i>	Mockernut hickory
<i>Carya cordiformis</i>	Bitternut/Swamp hickory
<i>Carya glabra</i>	Pignut hickory
<i>Carya illinoensis</i>	Pecan
<i>Carya laciniosa</i>	Shellbark hickory
<i>Carya ovalis</i>	Red Hickory
<i>Carya ovata</i>	Shagbark hickory
<i>Celtis laevigata</i>	Sugarberry/Hackberry
<i>Celtis occidentalis</i>	Common hackberry
<i>Cladrastis kentukea</i>	Yellowwood
<i>Diospyros virginiana</i>	Persimmon
<i>Fagus grandifolia</i>	Caroliniana/American beech
<i>Gymnocladus dioica</i>	Kentucky coffee tree
<i>Hamamelis virginiana</i>	Witch hazel
<i>Juglans cinerea</i>	Butternut
<i>Juglans nigra</i>	Black walnut
<i>Malus ioensis v. ioensis</i>	Prairie crabapple
<i>Ostrya virginiana</i>	Ironwood/Hophornbeam
<i>Pinus strobus</i>	White pine
<i>Prunus nigra</i>	Canada plum
<i>Populus deltoides</i>	Eastern cottonwood
<i>Prunus americana</i>	Wild plum
<i>Prunus serotina</i>	Black cherry
<i>Pyrus coronaria</i>	Sweet crabapple
<i>Quercus alba</i>	White oak
<i>Quercus imbricaria</i>	Shingle oak
<i>Quercus macrocarpa</i>	Bur oak
<i>Quercus marilandica</i>	Blackjack oak
<i>Quercus michauxii</i>	Swamp Chestnut oak
<i>Quercus muhlenbergii</i>	Chinkapin oak/Chestnut oak
<i>Quercus prinus</i>	Rock Chestnut oak
<i>Quercus stellata</i>	Post oak
<i>Quercus velutina</i>	Black oak
<i>Tilia americana</i>	American Linden/Basswood
<i>Tsuga canadensis</i>	Eastern hemlock

Table 30-7
Shrubs & Small Trees

Table 30-7: Shrubs & Small Trees	
Botanic Name	Common Name
<i>Alnus incana</i>	speckled alder, mountain alder
<i>Alnus serrulata</i>	smooth alder
<i>Amelanchier arborea</i>	downy serviceberry, shadebush, Juneberry
<i>Amelanchier laevis</i>	allegheny serviceberry
<i>Amelanchier sanguinea</i>	roundleaf serviceberry
<i>Amorpha fruticosa</i>	false indigo, Indigo bush
<i>Aronia melanocarpa</i>	black chokeberry
<i>Asimina triloba</i>	Pawpaw
<i>Ceanothus americanus</i>	New Jersey tea, red root
<i>Cephalanthus occidentalis</i>	buttonbush
<i>Comptonia peregrina</i>	sweet fern
<i>Cornus alternifolia</i>	pagoda dogwood, alternate-leaved dogwood
<i>Cornus amomum</i> ssp. <i>obliqua</i>	swamp dogwood, silky dogwood
<i>Cornus drummondii</i>	rough-leaf dogwood
<i>Cornus florida</i>	flowering dogwood
<i>Cornus racemosa</i>	gray dogwood
<i>Cornus sericea</i>	red-twig dogwood, red-osier dogwood
<i>Corylus americana</i>	American hazelnut or filbert
<i>Crataegus crus-galli</i>	cockspur hawthorn
<i>Crataegus mollis</i>	downy hawthorn
<i>Crataegus phaenopyrum</i>	Washington Hawthorn
<i>Crataegus punctata</i>	dotted hawthorn
<i>Dirca palustris</i>	leatherwood, ropebark
<i>Euonymus americana</i>	strawberry bush, brook euonymus
<i>Euonymus atropurpurea</i>	wahoo, burning bush
<i>Gaylussacia baccata</i>	Black Huckleberry
<i>Ilex glabra</i>	Inkberry
<i>Hypericum hypericoides</i> ssp. <i>hypericoides</i>	St. Andrew's cross
<i>Hypericum prolificum</i>	shrubby St. John's wort
<i>Ilex verticillata</i>	winterberry, black alder
<i>Itea virginica</i>	Virginia Sweetspire
<i>Juniperus</i>	Common juniper, ground juniper, prostrate juniper, US Native only
<i>Lindera benzoin</i>	spicebush
<i>Lonicera dioica</i>	limber or wild honeysuckle
<i>Physocarpus opulifolius</i>	ninebark
<i>Prunus virginiana</i>	chokecherry
<i>Rhamnus caroliniana</i>	Carolina buckthorn
<i>Rhus copallinum</i>	dwarf or winged sumac
<i>Rhus glabra</i>	smooth sumac

Table 30-7: Shrubs & Small Trees

Botanic Name	Common Name
<i>Rhus typhina</i>	staghorn sumac
<i>Ribes cynosbati</i>	prickly gooseberry, dogberry
<i>Rosa carolina</i>	Carolina rose
<i>Rosa setigera</i>	Illinois or prairie rose
<i>Rubus idaeus ssp. strigosus</i>	red raspberry
<i>Rubus occidentalis</i>	black raspberry, thimbleberry
<i>Salix bebbiana</i>	Bebb willow, long-beaked willow
<i>Salix discolor</i>	pussy willow
<i>Sambucus canadensis</i>	elderberry, common elder
<i>Spiraea alba</i>	meadow sweet
<i>Spiraea tomentosa</i>	steeplesh, hardhack
<i>Staphylea trifolia</i>	bladdernut
<i>Symphoricarpos orbiculatus</i>	coralberry, Indian currant
<i>Thuja occidentalis</i>	American Arborvitae
<i>Vaccinium angustifolium</i>	low-bush blueberry
<i>Vaccinium stamineum</i>	Deerberry
<i>Vaccinium vacillans</i>	Dryland Blueberry
<i>Viburnum</i>	US native only
<i>Viburnum acerifolium</i>	maple leaf viburnum
<i>Viburnum lentago</i>	black haw, nannyberry
<i>Viburnum prunifolium</i>	black haw, nanny berry
<i>Viburnum rufidulum</i>	southern or rusty black haw
<i>Viburnum trilobum</i>	American Cranberry Bush

Table 30-8**Perennials**

(*Species with asterisks are shallow water emergent)

Table 30-8: Perennials	
Botanic Name	Common Name
<i>Acorus calamus</i>	Sweet Flag*, calamus
<i>Actaea pachypoda</i>	white baneberry
<i>Actinomeris alternifolia</i>	Wingstem
<i>Alisma subcordatum</i>	Water Plantain*
<i>Allium cernuum</i>	Nodding Wild Onion
<i>Allium tricoccum</i>	wild leek
<i>Amorpha canescens</i>	leadplant
<i>Anemone canadensis</i>	Canada anemone, windflower
<i>Anemone cylindrica</i>	thimbleweed, candle anemone
<i>Anemone virginiana</i>	thimbleweed, tall anemone
<i>Angelica atropurpurea</i>	Angelica
<i>Apocynum androsaemifolium</i>	spreading dogbane
<i>Aquilegia canadensis</i>	columbine
<i>Arisaema triphyllum</i>	Jack-in-the-pulpit, Indian turnip
<i>Aruncus dioicus</i>	goat's beard
<i>Asarum canadense</i>	wild ginger
<i>Asclepias incarnata</i>	swamp milkweed
<i>Asclepias incarnate</i>	Marsh Milkweed
<i>Asclepias tuberosa</i>	Butterflyweed
<i>Asclepias verticillata</i>	whorled milkweed
<i>Aster azureus</i>	Sky Blue Aster
<i>Aster cordifolius</i>	Heart Leaved Blue Wood Aster
<i>Aster ericoides</i>	heath aster, white wreath aster
<i>Aster firmus</i>	Shining Aster
<i>Aster laevis</i>	Smooth Aster
<i>Aster lateriflorus</i>	Side Flowering Aster
<i>Aster novae-angliae</i>	New England Aster
<i>Aster pilosus</i>	frost aster
<i>Aster puniceus</i>	red-stem aster, swamp aster
<i>Aster sericeus</i>	Silky Aster
<i>Aster shortii</i>	Short's Aster
<i>Aster simplex</i>	Panicled Aster
<i>Aster umbellatus</i>	Flat Topped Aster
<i>Astragalus canadensis</i>	milk vetch, Canada milk vetch
<i>Baptisia alba</i>	white false indigo
<i>Baptisia australis</i>	Blue False Indigo
<i>Baptisia leucantha</i>	White False Indigo
<i>Blephilia hirsute</i>	Hairy Wood Mint
<i>Boltonia latisquama</i>	False Aster
<i>Caltha palustris</i>	marsh marigold, cowslip*
<i>Camassia scilloides</i>	wild hyacinth

Table 30-8: Perennials	
Botanic Name	Common Name
<i>Campanula rotundifolia</i>	harebell
<i>Cassia hebecarpa</i>	Wild Senna
<i>Caulophyllum thalictroides</i>	blue cohosh
<i>Chelone glabra</i>	turtlehead
<i>Chelone oblique</i>	Pink Turtlehead
<i>Claytonia virginica</i>	narrow-leaved spring beauty
<i>Collinsonia canadensis</i>	stoneroot, citronella horsebalm
<i>Coreopsis lanceolata</i>	lance-leaved coreopsis
<i>Coreopsis palmata</i>	stiff coreopsis
<i>Coreopsis palmate</i>	Plains Coreopsis
<i>Coreopsis tripteris</i>	tall coreopsis
<i>Dalea candida</i>	white prairie clover
<i>Dalea purpurea</i>	purple prairie clover
<i>Decodon verticillatus</i>	Swamp Loosestrife
<i>Delphinium tricornes</i>	dwarf larkspur
<i>Desmodium canadense</i>	Canada tick-trefoil, Canada tickclover
<i>Desmodium illinoense</i>	Illinois tick-trefoil, Illinois tickclover
<i>Dicentra cucullaria</i>	dutchman's breeches
<i>Dodecatheon meadia</i>	shooting star
<i>Echinacea pallida</i>	Pale Purple Coneflower
<i>Echinacea purpurea</i>	purple coneflower
<i>Eryngium yuccifolium</i>	rattlesnake master, button snake-root
<i>Erythronium americanum</i>	eastern trout lily, yellow trout lily
<i>Eupatorium coelestinum</i>	mist flower
<i>Eupatorium fistulosum</i>	Joe-pye weed
<i>Eupatorium maculatum</i>	spotted Joe-pye weed
<i>Eupatorium perfoliatum</i>	boneset
<i>Eupatorium purpureum</i>	Joe-pye weed
<i>Eupatorium rugosum</i>	white snakeroot
<i>Euphorbia corollata</i>	flowering spurge
<i>Filipendula rubra</i>	Queen of the Prairie
<i>Fragaria virginiana</i>	wild strawberry
<i>Galium triflorum</i>	sweet-scented bedstraw
<i>Gentiana andrewsii</i>	bottle gentian
<i>Gentiana saponaria</i>	closed gentian, soapwort gentian
<i>Geranium maculatum</i>	wild geranium, cranesbill
<i>Helenium autumnale</i>	common sneezeweed
<i>Helianthus divaricatus</i>	woodland sunflower
<i>Helianthus grosseserratus</i>	Sawtooth Sunflower
<i>Helianthus mollis</i>	Downy Sunflower
<i>Helianthus occidentalis</i>	Western Sunflower
<i>Helianthus pauciflorus ssp.</i>	pauciflorus stiff sunflower
<i>Helianthus rigidus</i>	Showy Sunflower
<i>Heliopsis helianthoides</i>	ox-eye sunflower, false sunflower

Table 30-8: Perennials	
Botanic Name	Common Name
<i>Hepatica nobilis v. acuta</i>	sharp-lobed hepatica
<i>Heuchera americana v. hirsuticaulis</i>	alumroot
<i>Heuchera richardsonii</i>	alum root
<i>Hibiscus moscheutos</i>	swamp rose mallow, marshmallow hibiscus
<i>Hibiscus palustris</i>	Swamp Rose Mallow
<i>Hieracium gronovii</i>	hawkweed
<i>Houstonia caerulea</i>	bluets
<i>Hydrastis canadensis</i>	golden seal
<i>Hydrophyllum virginianum</i>	Virginia waterleaf
<i>Hypericum pyramidatum</i>	Great St. John's Wort
<i>Hypoxis hirsuta</i>	yellow star grass
<i>Iris cristata</i>	dwarf crested iris
<i>Iris versicolor</i>	Wild Iris*
<i>Iris virginica v. shrevei</i>	blue flag iris
<i>Justicia Americana</i>	Water Willow*
<i>Lespedeza capitata</i>	roundheaded bush clover
<i>Liatris aspera</i>	rough blazing star, gayfeather
<i>Liatris cylindracea</i>	dwarf blazing star, gayfeather
<i>Liatris scariosa nieuwlandii</i>	Savanna Blazing Star
<i>Liatris spicata</i>	marsh blazing star, gayfeather
<i>Liatris spicata</i>	Dense Blazing Star
<i>Liatris squarrosa</i>	blazing star
<i>Lilium michiganense</i>	Turk's cap lily, Michigan lily
<i>Linum virginianum</i>	woodland flax
<i>Lithospermum canescens</i>	hoary puccoon
<i>Lobelia cardinalis</i>	cardinal flower
<i>Lobelia siphilitica</i>	great blue lobelia
<i>Lupinus perennis</i>	wild lupine
<i>Lycopus americanus</i>	Common Water Horehound
<i>Lysimachia ciliata</i>	fringed loosestrife
<i>Maianthemum canadense</i>	wild lily-of-the-valley, Canada mayflower
<i>Mertensia virginica</i>	bluebells
<i>Mimulus ringens</i>	Monkeyflower
<i>Mitchella repens</i>	partridge berry
<i>Monarda fistulosa</i>	wild bergamot, horsemint, beebalm
<i>Nuphar advena</i>	yellow pond lily, cow lily, spatter dock *
<i>Osmorhiza claytonii</i>	sweet cicely, sweet jarvil
<i>Parthenium integrifolium</i>	Wild Quinine
<i>Peltandra virginica</i>	Arrow Arum*
<i>Penstemon calycocis</i>	Smooth Beardtongue, Smooth penstemon
<i>Penstemon digitalis</i>	Foxglove Beardtongue, Foxglove penstemon
<i>Penstemon hirsutus</i>	hairy beardtongue
<i>Petalostemum candidum</i>	White Prairie Clover

Table 30-8: Perennials	
Botanic Name	Common Name
<i>Petalostemum purpureum</i>	Purple Prairie Clover
<i>Phlox divaricata</i>	blue phlox, sweet William
<i>Phlox paniculata</i>	summer phlox, perennial phlox
<i>Phlox pilosa</i>	prairie phlox, downy phlox
<i>Physostegia virginiana</i>	obedient plant, false dragonhead
<i>Podophyllum peltatum</i>	May apple
<i>Polemonium reptans</i>	Jacob's ladder, Greek valerian
<i>Polygonatum biflorum</i>	Solomon's seal
<i>Pontederia cordata</i>	Pickerel Weed*
<i>Potentilla arguta</i>	white cinquefoil, prairie cinquefoil, tall cinquefoil
<i>Potentilla fruticosa</i>	potentilla, shrubby cinquefoil
<i>Potentilla simplex</i>	common cinquefoil
<i>Pycnanthemum tenuifolium</i>	slender mountain mint
<i>Pycnanthemum virginianum</i>	mountain mint
<i>Ranunculus hispidus</i>	early buttercup, tufted buttercup
<i>Ratibida pinnata</i>	gray-headed coneflower, yellow coneflower
<i>Rhexia virginica</i>	meadow beauty
<i>Rudbeckia fulgida speciosa</i>	Showy Black Eyed Susan
<i>Rudbeckia laciniata</i>	cut-leaf coneflower
<i>Rudbeckia subtomentosa</i>	sweet black-eyed Susan
<i>Ruellia humilis</i>	wild petunia
<i>Sagittaria latifolia</i>	Common Arrowhead*
<i>Salvia lyrata</i>	cancer weed, lyre-leaf sage
<i>Sanguinaria canadensis</i>	bloodroot
<i>Saururus cernuus</i>	Lizard's Tail*
<i>Sedum ternatum</i>	wild stonecrop
<i>Senecio aureus</i>	golden ragwort
<i>Senecio obovatus</i>	Round leaved Golden Ragwort
<i>Silene regia</i>	Royal Catchfly
<i>Silene stellata</i>	starry campion
<i>Silene virginica</i>	fire pink
<i>Silphium integrifolium</i>	rosinweed
<i>Silphium laciniatum</i>	compass plant
<i>Silphium perfoliatum</i>	cup plant
<i>Silphium terebinthinaceum</i>	prairie dock
<i>Sisyrinchium albidum</i>	narrow-leaved blue-eyed grass
<i>Smilacena racemosa</i>	false Solomon's seal, false spikenard
<i>Smilacena stellata</i>	starry Solomon's seal
<i>Solidago caesia</i>	blue-stemmed goldenrod, wreath goldenrod
<i>Solidago flexicaulis</i>	Zig Zag Goldenrod
<i>Solidago gigantea</i>	Late Goldenrod
<i>Solidago graminifolia</i>	Grass Leaved Goldenrod
<i>Solidago juncea</i>	early goldenrod, plume goldenrod
<i>Solidago nemoralis</i>	gray goldenrod, old-field goldenrod

Table 30-8: Perennials	
Botanic Name	Common Name
<i>Solidago ohioensis</i>	Ohio Goldenrod
<i>Solidago patula</i>	Swamp Goldenrod
<i>Solidago riddellii</i>	Riddell's Goldenrod
<i>Solidago rigida</i>	stiff goldenrod
<i>Solidago rugosa</i>	rough-leaved goldenrod
<i>Solidago speciosa</i>	showy goldenrod
<i>Solidago ulmifolia</i>	elm-leaved goldenrod
<i>Sparganium androcladum</i>	Branched Burreed*
<i>Sparganium eurycarpum</i>	Giant Burreed*
<i>Stylophorum diphyllum</i>	celandine poppy
<i>Tephrosia virginiana</i>	goat's rue
<i>Thalictrum dasycarpum</i>	tall or purple meadow rue
<i>Thalictrum dioicum</i>	early meadow rue
<i>Thalictrum thalictroides</i>	rue anemone
<i>Tradescantia ohioensis</i>	Ohio spiderwort
<i>Tradescantia virginiana</i>	Virginia spiderwort, spider lily
<i>Uvularia grandiflora</i>	bellwort, merrybells
<i>Uvularia sessilifolia</i>	wildoats, merrybells
<i>Verbena hastata</i>	blue verbena, blue vervain
<i>Verbena stricta</i>	hoary vervain
<i>Vernonia altissima</i>	Tall Ironweed
<i>Vernonia fasciculata</i>	ironweed
<i>Veronicastrum virginicum</i>	Culver's root
<i>Viola pedata</i>	bird-foot violet
<i>Viola pubescens</i>	yellow violet
<i>Viola soraria</i>	common blue violet, meadow violet
<i>Zizia aurea</i>	golden alexander

Table 30-9
Grasses & Sedges

(*Species with asterisks are shallow water emergent)

Table 30-9: Grasses & Sedges	
Botanic Name	Common Name
<i>Agrostis parennans</i>	ticklegrass, fly-away grass
<i>Andropogon gerardii</i>	big bluestem
<i>Andropogon virginicus</i>	broom sedge
<i>Bouteloua curtipendula</i>	sideoats grama
<i>Brachyelytrum erectum</i>	long-awned wood grass
<i>Bromus kalmii</i>	prairie brome, wild chess
<i>Bromus latiglumis</i>	Tall Brome
<i>Bromus pubescens</i>	Woodland Brome
<i>Calamagrostis canadensis</i>	bluejoint grass
<i>Calamovilfa longifolia var magna</i>	Sand Reed
<i>Carex annectans xanthocarpa</i>	Yellow Fox Sedge
<i>Carex aquatilis</i>	water sedge
<i>Carex bicknellii</i>	Prairie Oval Sedge
<i>Carex brevior Plains</i>	Oval Sedge
<i>Carex bromoides</i>	Brome Hummock Sedge
<i>Carex cephalophora</i>	Short headed bracted sedge
<i>Carex comosa</i>	Bristly Sedge*
<i>Carex crinita</i>	Fringed Sedge
<i>Carex cristatella</i>	Crested Sedge
<i>Carex davisii</i>	Davis Wood Sedge
<i>Carex emoryi</i>	Riverbank Tussock Sedge
<i>Carex frankii</i>	Frank's Sedge
<i>Carex gracillima</i>	Graceful Wood Sedge
<i>Carex granularis</i>	Meadow Sedge
<i>Carex grayi</i>	Burr Sedge
<i>Carex hirtifolia</i>	Hairy Wood Sedge
<i>Carex hystericina</i>	Porcupine Sedge
<i>Carex Jamesii</i>	grass sedge
<i>Carex lacustris</i>	Lake Sedge*
<i>Carex laxiflora</i>	Beech Wood Sedge
<i>Carex lupulina</i>	Hop Sedge
<i>Carex lurida</i>	Lurid Sedge
<i>Carex molesta</i>	Field Oval Sedge
<i>Carex muhlenbergii</i>	Sand Bracted Sedge
<i>Carex muskingumensis</i>	Palm Sedge
<i>Carex normalis</i>	Spreading Oval Sedge
<i>Carex pellita</i>	Wooly Sedge
<i>Carex pennsylvanica</i>	Pennsylvania sedge
<i>Carex plantaginea</i>	plantain-leaved sedge
<i>Carex radiata</i>	Straight styled wood sedge

Table 30-9: Grasses & Sedges	
Botanic Name	Common Name
<i>Carex scoparia</i>	Lance fruited oval sedge
<i>Carex shortiana</i>	Short's Sedge
<i>Carex sparganioides</i>	Burreed Sedge
<i>Carex squarrosa</i>	Narrow leaved cattail sedge
<i>Carex stipata</i>	awl-fruited sedge
<i>Carex stricta</i>	tussock sedge
<i>Carex tribuloides</i>	Pointed Oval Sedge
<i>Carex trichocarpa</i>	Hairy fruited sedge
<i>Carex utriculata</i>	beaked sedge
<i>Carex vulpinoidea</i>	Fox Sedge
<i>Chasmanthium latifolium</i>	inland sea oats, wild oats, river oats, broad-leaf uniola
<i>Cinna arundinacea</i>	Common Wood Reed
<i>Danthonia spicata</i>	poverty grass
<i>Deschampsia caespitosa</i>	Tufted Hair Grass
<i>Diarrhena Americana</i>	Beak Grass
<i>Eleocharis erythropoda</i>	Creeping Spike
<i>Eleocharis palustris</i>	creeping spikesedge, spike rush
<i>Elymus canadensis</i>	Canada wild rye
<i>Elymus hystrix v. hystrix</i>	bottlebrush grass
<i>Elymus riparius</i>	Riverbank Wild Rye
<i>Elymus villosus</i>	Silky Wild Rye
<i>Elymus virginicus</i>	Virginia Wild Rye
<i>Eragrostis spectabilis</i>	purple lovegrass, tumblegrass
<i>Glyceria stricta</i>	American mannagrass, tall mannagrass, reed meadowgrass
<i>Hierochloe odorata</i>	sweet grass
<i>Hystrix patula</i>	Bottlebrush Grass
<i>Juncus Canadensis</i>	Canada Rush
<i>Juncus effusus v. solutus</i>	soft rush*
<i>Juncus interior</i>	inland rush
<i>Juncus torreyi</i>	Torrey's Rush
<i>Koeleria cristata</i>	June Grass
<i>Koeleria macrantha</i>	June grass
<i>Leersia oryzoides</i>	rice cut grass
<i>Panicum virgatum</i>	switchgrass
<i>Schizachyrium scoparium</i>	little bluestem
<i>Scirpus acutus</i>	hardstem bulrush
<i>Scirpus atrovirens</i>	dark green bulrush
<i>Scirpus cyperinus</i>	wool grass
<i>Scirpus fluviatilis</i>	River Bulrush*
<i>Scirpus pendulus</i>	Reddish Bulrush
<i>Scirpus pungens</i>	Three square bulrush
<i>Scirpus validus</i>	great bulrush
<i>Sorghastrum nutans</i>	Indian grass

Table 30-9: Grasses & Sedges	
Botanic Name	Common Name
<i>Spartina pectinata</i>	prairie cordgrass, freshwater cordgrass
<i>Sporobolus asper</i>	dropseed
<i>Sporobolus heterolepis</i>	Prairie Dropseed
<i>Stipa spartea</i>	porcupine grass

Table 30-10
Ferns

Table 30-10: Ferns	
Botanic Name	Common Name
<i>Adiantum pedatum</i>	northern maidenhair fern
<i>Asplenium platyneuron</i>	ebony spleenwort
<i>Athyrium filix-femina</i>	lady fern
<i>Botrychium virginianum</i>	rattlesnake fern
<i>Cystopteris bulbifera</i>	bladder fern
<i>Cystopteris protrusa</i>	fragile fern
<i>Dryopteris carthusiana</i>	shield fern, toothed wood fern, spinulose shield fern
<i>Dryopteris cristata</i>	crested wood fern, buckler fern
<i>Dryopteris marginalia</i>	marginal wood fern
<i>Matteuccia struthiopteris</i>	ostrich fern
<i>Onoclea sensibilis</i>	sensitive fern, bead fern
<i>Osmunda cinnamomea</i>	cinnamon fern
<i>Osmunda claytoniana</i>	interrupted fern
<i>Osmunda regalis</i>	royal fern
<i>Phegopteris hexagonoptera</i>	broad beech fern
<i>Polystichum acrostichoides</i>	Christmas fern
<i>Thelypteris palustris</i>	marsh fern
<i>Thelypteris novaboracensis</i>	New York fern, tapering fern

Table 30-11
Endangered Species

Table 30-11: Endangered Species	
Botanic Name	Common Name
<i>Asclepias meadii</i>	Mead's milkweed
<i>Cirsium pitcheri</i>	Pitcher's thistle
<i>Trifolium stoloniferum</i>	Running buffalo clover

Table 30-12
Recommended Trees for Bioretention Areas

Table 30-12: Recommended Trees for Bioretention Areas	
Botanic Name	Common Name
<i>Acer Rubrum</i>	Red Maple
<i>Betula nigra</i>	River Birch
<i>Gleditsia tricanthos</i>	Honeylocust
<i>Gymnocladus dioica</i>	Kentucky Coffee Tree
<i>Liriodendron tulipifera</i>	Tulip Tree
<i>Nyssa sylvatica</i>	Black Tupelo
<i>Platanus occidentalis</i>	Sycamore
<i>Quercus bicolor</i>	Swamp White Oak
<i>Salix amygdaloides</i>	Peachleaf Willow
<i>Taxodium distichum</i>	Bald Cypress

Table 30-13
Recommended Shrubs for Bioretention Areas

Table 30-13: Recommended Shrubs for Bioretention Areas	
Botanic Name	Common Name
<i>Cornus amomum</i>	Swamp Dogwood
<i>Cornus drummondii</i>	Rough-leaf Dogwood
<i>Cornus racemosa</i>	Gray Dogwood
<i>Cornus sericea</i>	Red twig dogwood
<i>Ilex glabra</i>	Inkberry
<i>Ilex verticillata</i>	Winterberry
<i>Itea virginica</i>	Virginia Sweetspire
<i>Salix bebbiana</i>	Bebb willow
<i>Salix discolor</i>	Pussy Willow
<i>Spieaea Alba</i>	Meadowsweet

Table 30-14
Recommended Perennials for Bioretention Areas
 (*Species with asterisks are shallow water emergent)

Table 30-14: Recommended Perennials for Bioretention Areas	
Botanic Name	Common Name
<i>Acorus calamus</i>	Sweet Flag* (tolerates drying)
<i>Actinomeris alternifolia</i>	Wingstem
<i>Alisma subcordatum</i>	Water Plantain*
<i>Allium cernuum</i>	Nodding Wild Onion

Table 30-14: Recommended Perennials for Bioretention Areas

Botanic Name	Common Name
<i>Anemone canadensis</i>	Canada anemone
<i>Anemone cylindrical</i>	Candle Thimbleweed
<i>Anemone Virginiana</i>	Tall Thimbleweed,
<i>Angelica atropurpurea</i>	Angelica
<i>Aquilegia canadensis</i>	columbine
<i>Asclepias incarnata</i>	Swamp milkweed
<i>Asclepias incarnate</i>	Marsh Milkweed
<i>Asclepias tuberosa</i>	Butterflyweed
<i>Aster azureus</i>	Sky blue aster
<i>Aster cordifolius</i>	Heart leaved blue aster
<i>Aster ericoides</i>	Heath Aster
<i>Aster firmus</i>	Shining Aster
<i>Aster laevis</i>	Smooth Aster
<i>Aster lateriflorus</i>	Side flowering aster
<i>Aster novae-angliae</i>	New England aster
<i>Aster pilosus</i>	Frost Aster
<i>Aster puniceus</i>	Red Stem Aster, Swamp Aster
<i>Aster sericeus</i>	Silky Aster
<i>Aster shortii</i>	Short's Aster
<i>Aster simplex</i>	Panicked Aster
<i>Aster umbellatus</i>	Flat Top Aster
<i>Baptisia australis</i>	Wild Blue Indigo, Blue False Indigo
<i>Baptisia bracteata</i>	Cream Wild Indigo
<i>Baptisia lacteal</i>	Wild White Indigo
<i>Baptisia leucantha</i>	White False Indigo
<i>Bidens cernua</i>	Nodding Bur Marigold
<i>Blephilia hirsute</i>	Hairy Wood Mint
<i>Boltonia latisquama</i>	False Aster
<i>Caltha palustris</i>	Marsh Marigold
<i>Cassia hebecarpa</i>	Wild Senna
<i>Chelone glabra</i>	White Turtlehead
<i>Chelone oblique</i>	Pink Turtlehead
<i>Coreopsis lanceolata</i>	Lance –Leaved Coreopsis
<i>Coreopsis palmate</i>	Stiff Coreopsis, Plains Coreopsis
<i>Coreopsis tripteris</i>	Tall Coreopsis
<i>Decodon verticillatus</i>	Swamp Loosestrife
<i>Desmodium illinoensis</i>	Illinois Sensitive Plant, IL Tick Trefoil
<i>Dodecatheon meadia</i>	Shooting Star
<i>Echinacea pallida</i>	Purple Coneflower
<i>Echinacea purpurea</i>	Broad-Leaved Purple Coneflower
<i>Eryngium yuccifolium</i>	Rattlesnake Master
<i>Eupatorium coelestinum</i>	Blue Mist Flower
<i>Eupatorium fistulosum</i>	Hollow Joe

Table 30-14: Recommended Perennials for Bioretention Areas

Botanic Name	Common Name
<i>Eupatorium maculatum</i>	Spotted Joe-pye weed
<i>Eupatorium maculatum</i>	Spotted Joe
<i>Eupatorium perfoliatum</i>	Boneset
<i>Eupatorium purpureum</i>	Sweet Joe
<i>Eupatorium rugosum</i>	White Snakeroot
<i>Filipendula rubra</i>	Queen of the Prairie
<i>Gentiana andrewsii</i>	Bottle Gentian
<i>Geranium maculatum</i>	Wild Geranium
<i>Helenium autumnale</i>	Common Sneezeweed
<i>Helianthus grosseserratus</i>	Sawtooth Sunflower
<i>Helianthus mollis</i>	Downy Sunflower
<i>Helianthus occidentalis</i>	Western Sunflower
<i>Helianthus rigidus</i>	Showy Sunflower
<i>Heliopsis helianthoides</i>	False Sunflower
<i>Hibiscus moscheutos</i>	Swamp Rose Mallow
<i>Hibiscus palustris</i>	Swamp Rose Mallow.
<i>Hydrophyllum virginianum</i>	Virginia Waterleaf
<i>Hypericum pyramidatum</i>	Great St.John's Wort
<i>Iris versicolor</i>	Wild Iris*
<i>Iris virginica</i>	Blue Flag
<i>Iris virginica shrevei</i>	Blue Flag Iris OBL
<i>Justicia Americana</i>	Water Willow
<i>Lespedeza captiata</i>	Round
<i>Liatris aspera</i>	Rough Blazing Star
<i>Liatris pycnostachya</i>	Prairie Blazing Star
<i>Liatris scariosa nieuwlandii</i>	Savanna Blazing Star
<i>Liatris spicata</i>	Marsh Blazing Star, Dense Blazing Star
<i>Lobelia siphilitica</i>	Great Blue Lobelia
<i>Lobelis cardinalis</i>	Cardinal Flower
<i>Lobelis siphilitica</i>	Great Blue Lobelia
<i>Lycopus americanus</i>	Common Water Horehound.
<i>Mimulus ringens</i>	Monkeyflower
<i>Parthenium integrifolium</i>	Wild Quince
<i>Parthenium integrifolium</i>	Wild Quinine
<i>Peltandra virginica</i>	Arrow Arum*
<i>Penstemon calycosus</i>	Smooth Penstemon
<i>Penstemon digitalis</i>	Foxglove Penstemon
<i>Penstemon hirsutus</i>	Hairy Penstemon
<i>Petalostemum candidum</i>	White Prairie Clover
<i>Petalostemum purpureum</i>	Purple Prairie Clover
<i>Physostegia virginiana</i>	Obedient Plant
<i>Pontederia cordata</i>	Pickerel Weed*
<i>Potentilla arguta</i>	Prairie Cinquefoil

Table 30-14: Recommended Perennials for Bioretention Areas

Botanic Name	Common Name
<i>Pycnanthemum tenuifolium</i>	Narrow leaf mountain mint
<i>Pycnanthemum virginianum</i>	Common Mountain Mint
<i>Ratibida pinnata</i>	Yellow Coneflower
<i>Rudbeckia fulgida speciosa</i>	Showy Black Eyed Susan
<i>Rudbeckia hirta</i>	Black Eyed Susan
<i>Rudbeckia laciniata</i>	Green headed coneflower
<i>Rudbeckia subtomentosa</i>	Sweet Bland-Eyed Susan
<i>Rudbeckia triloba</i>	Brown-Eyed Susan
<i>Sagittaria latifolia</i>	Common Arrowhead*
<i>Saururus cernuus</i>	Lizard's Tail*
<i>Sedum ternatum</i>	Wild Stonecrop
<i>Senecio aureas</i>	Golden Ragwort
<i>Senecio obovatus</i>	Roundleaf ragwort
<i>Silene regia</i>	Royal Catchfly
<i>Silphium integrifolium</i>	Rosinweed
<i>Silphium laciniatum</i>	Compass Plant
<i>Silphium perfoliatum</i>	Cup Plant
<i>Silphium terebinthinaceum</i>	Prairie Dock
<i>Solidago caesia</i>	Bluestem golden aka Wreath Goldenrod
<i>Solidago flexicaulis</i>	Zig Zag Goldenrod
<i>Solidago gigantean</i>	Late Goldenrod
<i>Solidago graminifolia</i>	Grass leaved goldenrod
<i>Solidago juncea</i>	Early Goldenrod.
<i>Solidago nemoralis</i>	Grey Goldenrod
<i>Solidago ohioensis</i>	Ohio Goldenrod
<i>Solidago patula</i>	Swamp Goldenrod
<i>Solidago riddellii</i>	Riddell's Goldenrod
<i>Solidago rigida</i>	Stiff Goldenrod
<i>Solidago rugosa</i>	Wrinkled Goldenrod
<i>Solidago speciosa</i>	Showy Goldenrod
<i>Sparganium androcladum</i>	Branched Burreed*
<i>Sparganium eurycarpum</i>	Giant Burreed*
<i>Stylophorum diphyllum</i>	Celandine Poppy
<i>Tradescantia ohiensis</i>	Ohio Spiderwort
<i>Verbena hastate</i>	Blue Vervain
<i>Vernonia altissima</i>	Tall Ironweed
<i>Vernonia fasciculata</i>	Smooth Ironweed
<i>Veronicastrum virginicum</i>	Culver's Root
<i>Zizia aurea</i>	Golden Alexander

Table 30-15**Recommended Grasses & Sedges for Bioretention Areas**

(*Species with asterisks are shallow water emergent)

Table 30-15: Recommended Grasses & Sedges for Bioretention Areas	
Botanic Name	Common Name
<i>Andropogon gerardii</i>	Big Blue Stem
<i>Bouteloua curtipendula</i>	Sideoats Grama
<i>Bromus latiglumis</i>	Tall Brome
<i>Bromus pubescens</i>	Woodland Brome
<i>Calamagrostis Canadensis</i>	Bluejoint
<i>Calamovilfa longifolia var magna</i>	Sand Reed
<i>Carex annectans var xanthocarpa</i>	Yellow Fox Sedge
<i>Carex aquatilis</i>	Water sedge
<i>Carex bicknellii</i>	Prairie Oval Sedge
<i>Carex brevior Plains</i>	Oval Sedge.
<i>Carex bromoides</i>	Brome Hummock Sedge
<i>Carex cephalophora</i>	Short headed bracted sedge
<i>Carex comosa</i>	Bristly Sedge*
<i>Carex crinita</i>	Fringed Sedge
<i>Carex cristatella</i>	Crested Sedge
<i>Carex davisii</i>	Davis Wood Sedge
<i>Carex emoryi</i>	Riverbank Tussock Sedge
<i>Carex frankii</i>	Bristly Cattail Sedge, Frank's Sedge
<i>Carex gracillima</i>	Graceful Wood Sedge
<i>Carex granularis</i>	Meadow Sedge
<i>Carex grayi</i>	Burr Sedge
<i>Carex hirtifolia</i>	Hairy Wood Sedge
<i>Carex hystericina</i>	Porcupine Sedge
<i>Carex jamesii</i>	Grass Sedge
<i>Carex lacustris</i>	Lake Sedge*
<i>Carex laxiflora</i>	Beech Wood Sedge
<i>Carex lupulina</i>	Hop Sedge
<i>Carex lurida</i>	Bottlebrush Sedge, Lurid Sedge
<i>Carex molesta</i>	Field Oval Sedge
<i>Carex muhlenbergii</i>	Sand Bracted Sedge
<i>Carex muskingumensis</i>	Palm Sedge
<i>Carex normalis</i>	Spreading Oval Sedge
<i>Carex pellita</i>	Wooly Sedge
<i>Carex pensylvanica</i>	Grass Sedge
<i>Carex plantaginea</i>	Plantain-Leaved Sedge
<i>Carex radiate</i>	Straight styled wood sedge
<i>Carex scoparia</i>	Lance fruited oval sedge
<i>Carex shortiana</i>	Short's Sedge
<i>Carex sparganioides</i>	Burreed Sedge

Table 30-15: Recommended Grasses & Sedges for Bioretention Areas	
Botanic Name	Common Name
<i>Carex squarrosa</i>	Narrow leaved cattail sedge
<i>Carex Stipata</i>	Awl-Fruited Sedge
<i>Carex stricta</i>	Tussock Sedge
<i>Carex tribuloides</i>	Pointed Oval Sedge
<i>Carex trichocarpa</i>	Hairy fruited sedge
<i>Carex vulpinoidea</i>	Fox Sedge
<i>Chasmanthium latifolium</i>	Northern Sea Oats
<i>Cinna arundinacea</i>	Common Wood Reed
<i>Deschampsia caespitosa</i>	Tufted Hair Grass
<i>Diarrhena Americana</i>	Beak Grass.
<i>Eleocharis erythropoda</i>	Creeping Spike
<i>Elymus Canadensis</i>	Canada Wild Rye
<i>Elymus hystrix</i>	Bottlebrush Grass
<i>Elymus riparius</i>	Riverbank Wild Rye
<i>Elymus villosus</i>	Silky Wild Rye
<i>Elymus virginicus</i>	Virginia Wild Rye
<i>Eragrostis spectabilis</i>	Purple Love Grass
<i>Glyceria striata</i>	Fowl Manna Grass
<i>Glyceria stricta</i>	American mannagrass
<i>Hystrix patula</i>	Bottlebrush Grass
<i>Juncus Canadensis</i>	Canada Rush
<i>Juncus effuses</i>	Soft Rush*
<i>Juncus interior</i>	Inland Rush
<i>Juncus torreyi</i>	Torrey's Rush
<i>Koeleria cristata</i>	June Grass
<i>Koeleria pyramidata</i>	June Grass
<i>Leersia oryzoides</i>	Rice cutgrass
<i>Panicum virgatum</i>	Switch Grass
<i>Schizachyrium scoparium</i>	Little Blue Stem
<i>Scirpus acutus</i>	Hardstem Bulrush*
<i>Scirpus atrovirens</i>	Dark Green Bulrush
<i>Scirpus Cyperinus</i>	Wool Grass
<i>Scirpus fluviatilis</i>	River Bulrush*
<i>Scirpus pendulus</i>	Reddish Bulrush
<i>Scirpus pungens</i>	Three square bulrush aka chair makers rush
<i>Scirpus validus</i>	Great Bulrush
<i>Sorghastrum nutans</i>	Indian Grass
<i>Spartina pectinata</i>	Prairie Cordgrass
<i>Sporobolus heterolepis</i>	Prairie Dropseed

[end of chapter]