



Roanoke County Design Handbook

Adopted May 26, 2009

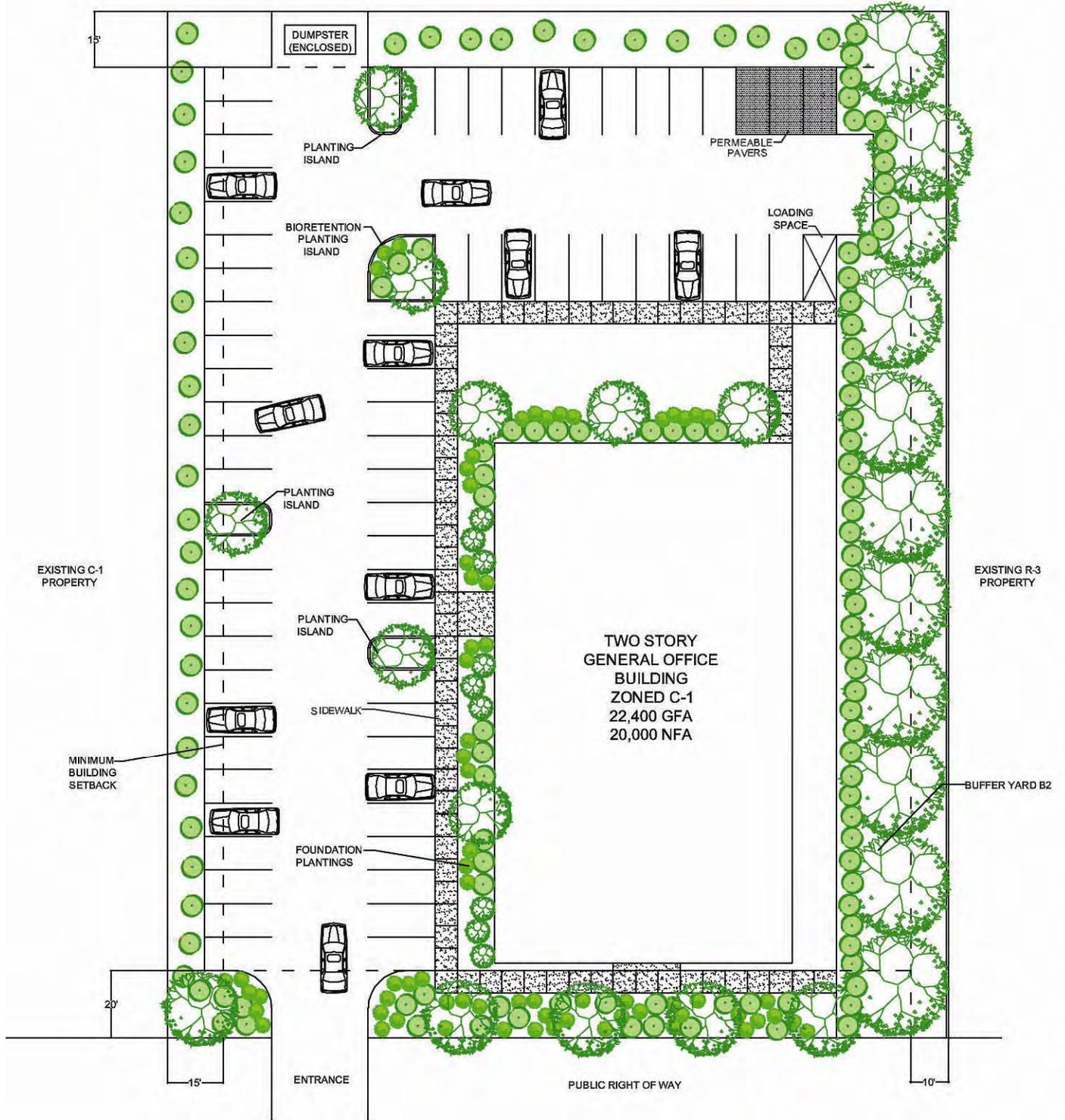
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Chapter 1: Site Design

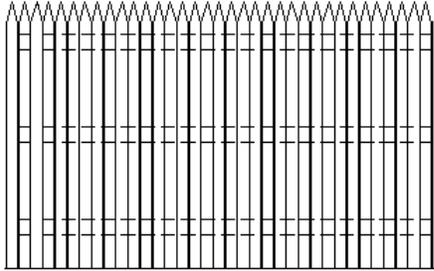
Section 1 – Site Layout Example



Chapter 2: Landscaping

Section 1 – Screening Materials

(A) Stockade Fence:



(B) Decorative Masonry Wall

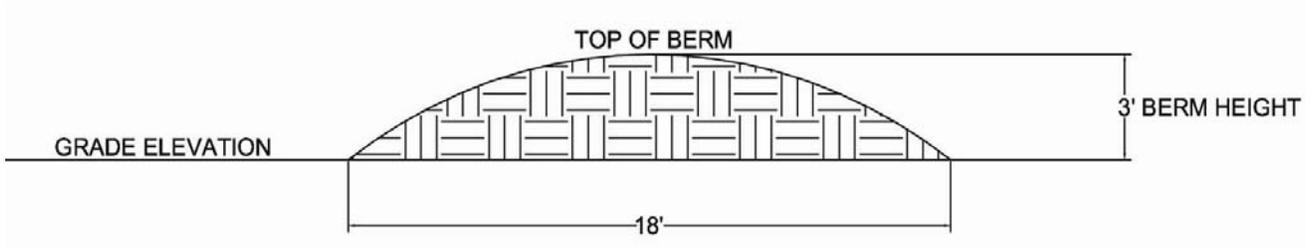


(C) Brick Wall

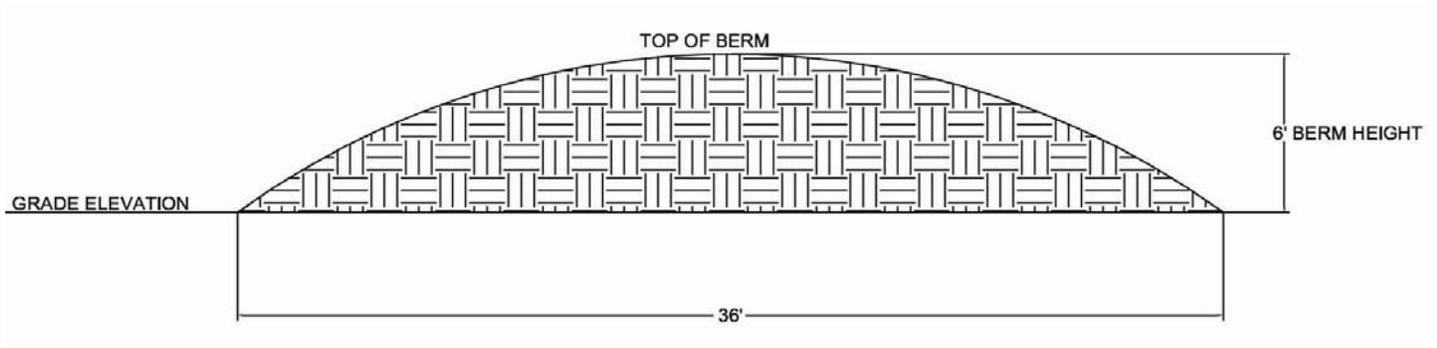


(D) Earth Berms

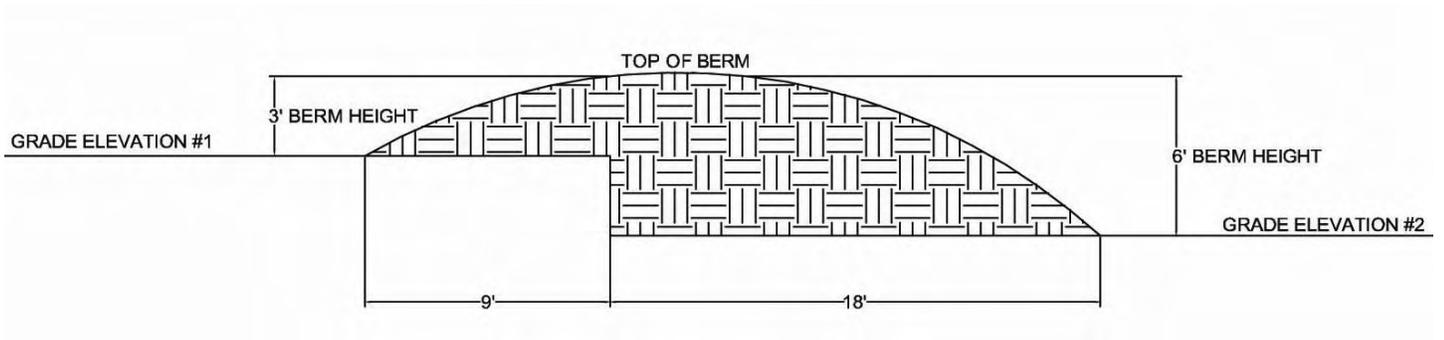
1. Three (3) Foot Tall Berm



2. Six (6) Foot Tall Berm



3. Varying Height Berm spanning two different grade elevations



Section 2 – Landscaped Buffer Yards

(A) Type A Buffer

“Row” should not be construed as meaning that the plants must be uniformly planted.

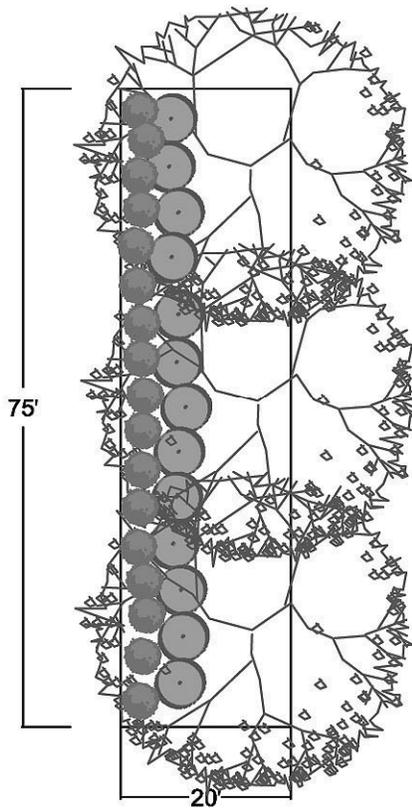
TYPE A BUFFER

OPTION 1:
20' Buffer

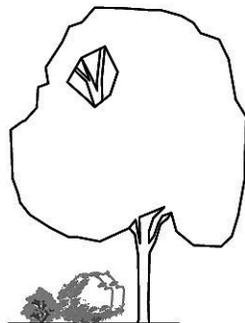
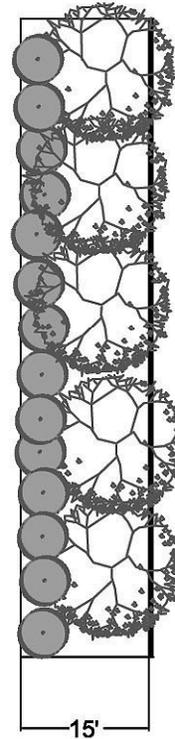
For every 75' consisting of:
One row of large deciduous trees (3)
One row of large evergreen shrubs (12-14)
One row of large deciduous shrubs (16-18)

OPTION 2:
15' Buffer

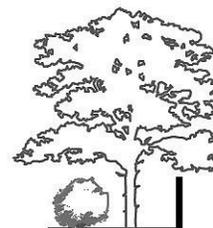
For every 75' consisting of:
One row of small deciduous trees (5)
One row of large evergreen shrubs (12-14)
6' Screening



PLAN VIEW



ELEVATION



(B) Type B Buffer

“Row” should not be construed as meaning that the plants must be uniformly planted.

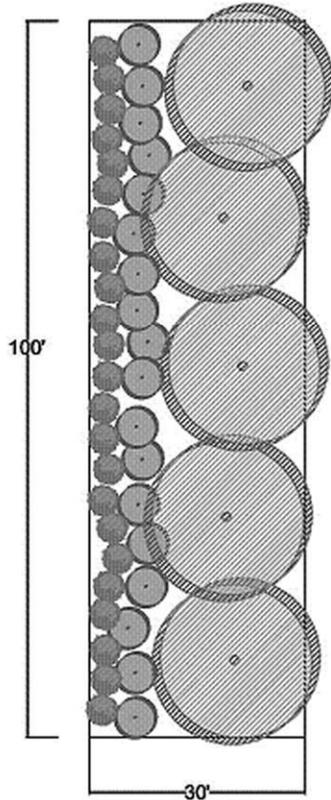
TYPE B BUFFER

**OPTION 1:
30' Buffer**

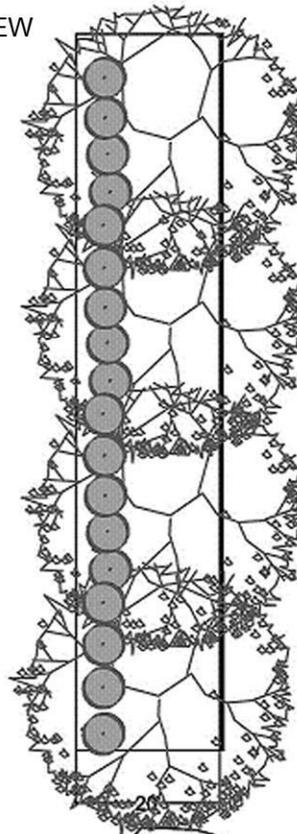
For every 100' consisting of:
One row of large evergreens trees (5)
One row of large evergreen shrubs (16-18)
One row of large deciduous shrubs (22-24)

**OPTION 2:
20' Buffer**

For every 100' consisting of:
One row of large deciduous trees (4)
One row of large evergreen shrubs (16-18)
6' Screening



PLAN VIEW



ELEVATION



(C) Type C Buffer

“Row” should not be construed as meaning that the plants must be uniformly planted.

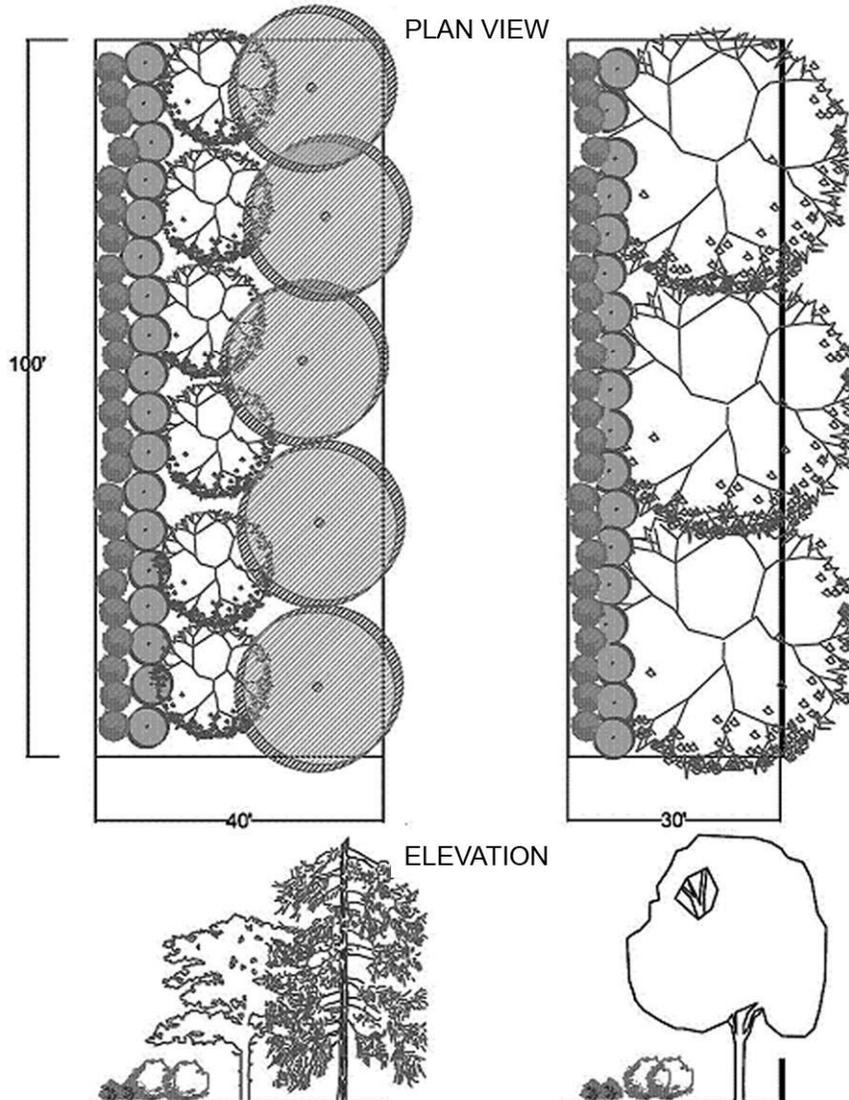
TYPE C BUFFER

OPTION 1:
40' Buffer

- For every 100' consisting of:
- One row of large evergreens trees (5)
 - One row of small deciduous trees (6)
 - One row of large evergreen shrubs (16-18)
 - One row of large deciduous shrubs (22-24)

OPTION 2:
30' Buffer

- For every 100' consisting of:
- One row of large deciduous trees (3)
 - One row of large evergreen shrubs (16-18)
 - One row of large deciduous shrubs (22-24)
 - 6' Screening



(D) Type D Buffer

“Row” should not be construed as meaning that the plants must be uniformly planted.

TYPE D BUFFER

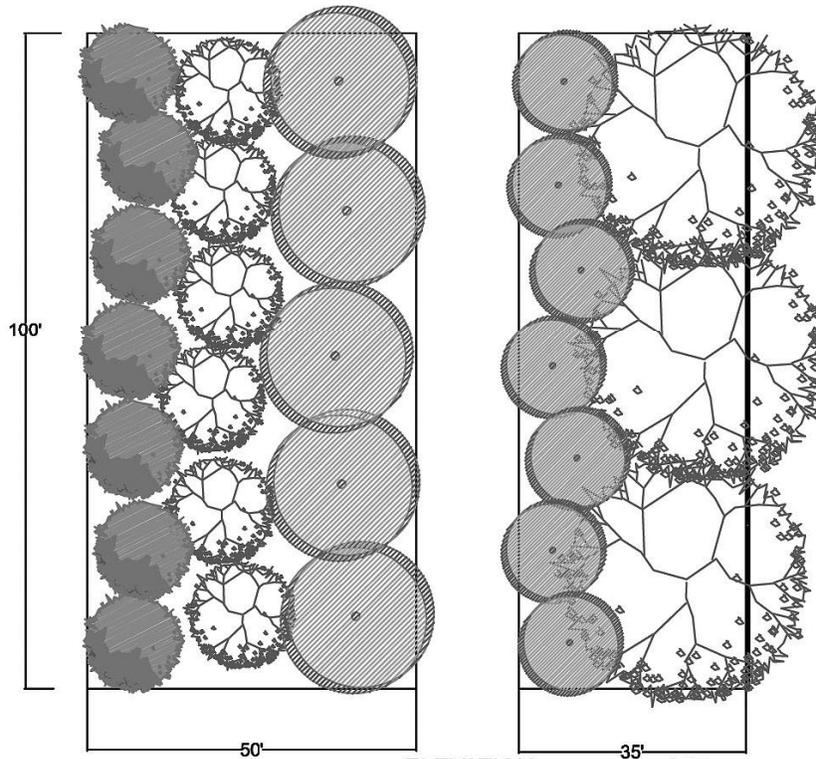
OPTION 1:
50' Buffer

For every 100' consisting of:
One row of large evergreen trees (5)
Two rows of small deciduous trees, two different species (6-7 per row)

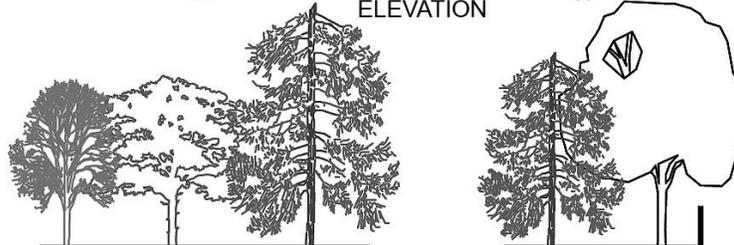
OPTION 2:
35' Buffer

For every 100' consisting of:
One row of large deciduous trees (3)
One row of small evergreen trees (6-7)
6' Screening

PLAN VIEW



ELEVATION



(E) Type E Buffer

“Row” should not be construed as meaning that the plants must be uniformly planted.

TYPE E BUFFER

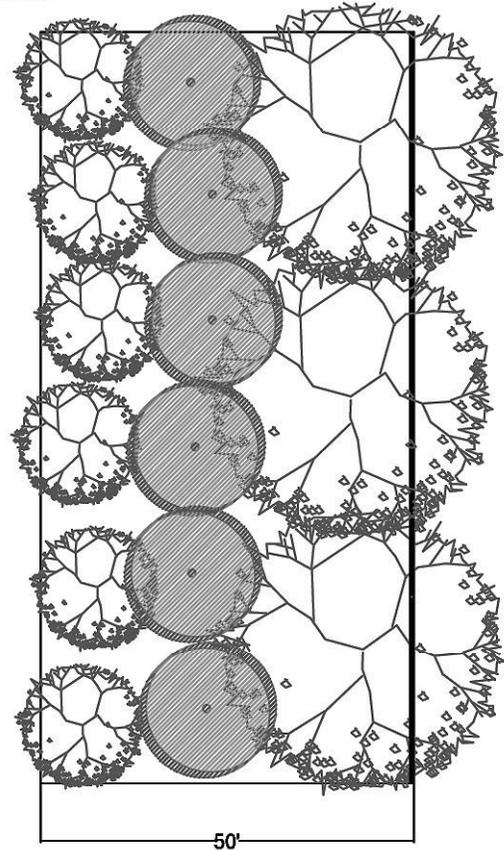
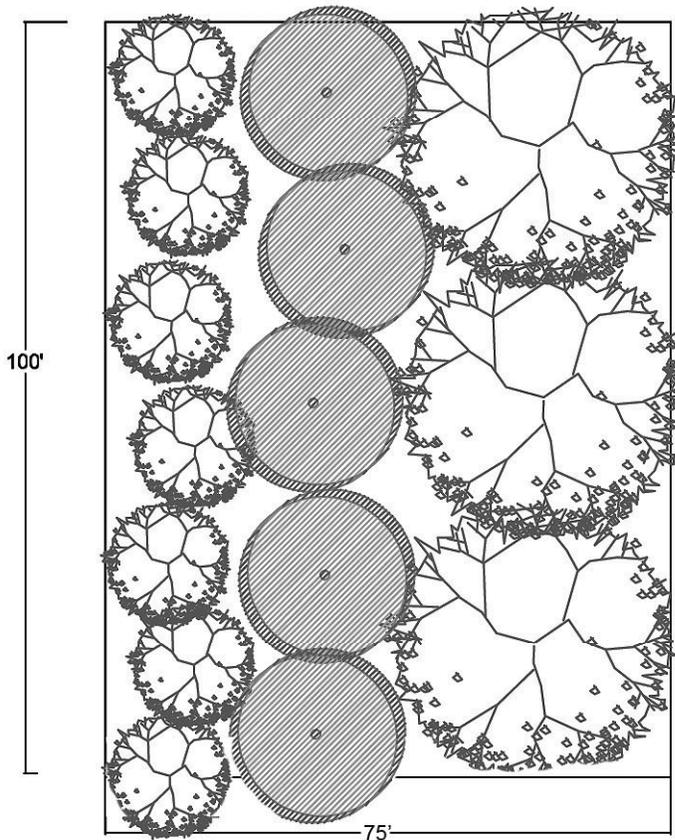
**OPTION 1:
75' Buffer**

- For every 100' consisting of:
One row of large deciduous trees (3)
One row of large evergreen trees (5)
One row of small deciduous trees (7)

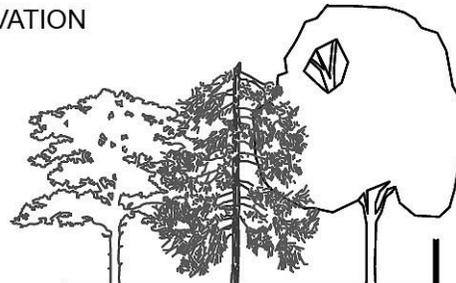
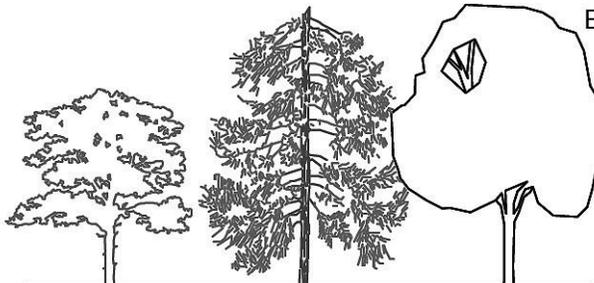
**OPTION 2:
50' Buffer**

- For every 100' consisting of:
One row of large deciduous trees (3)
One row of small evergreen trees (6)
One row of small deciduous trees (6-7)
6' Screening

PLAN VIEW

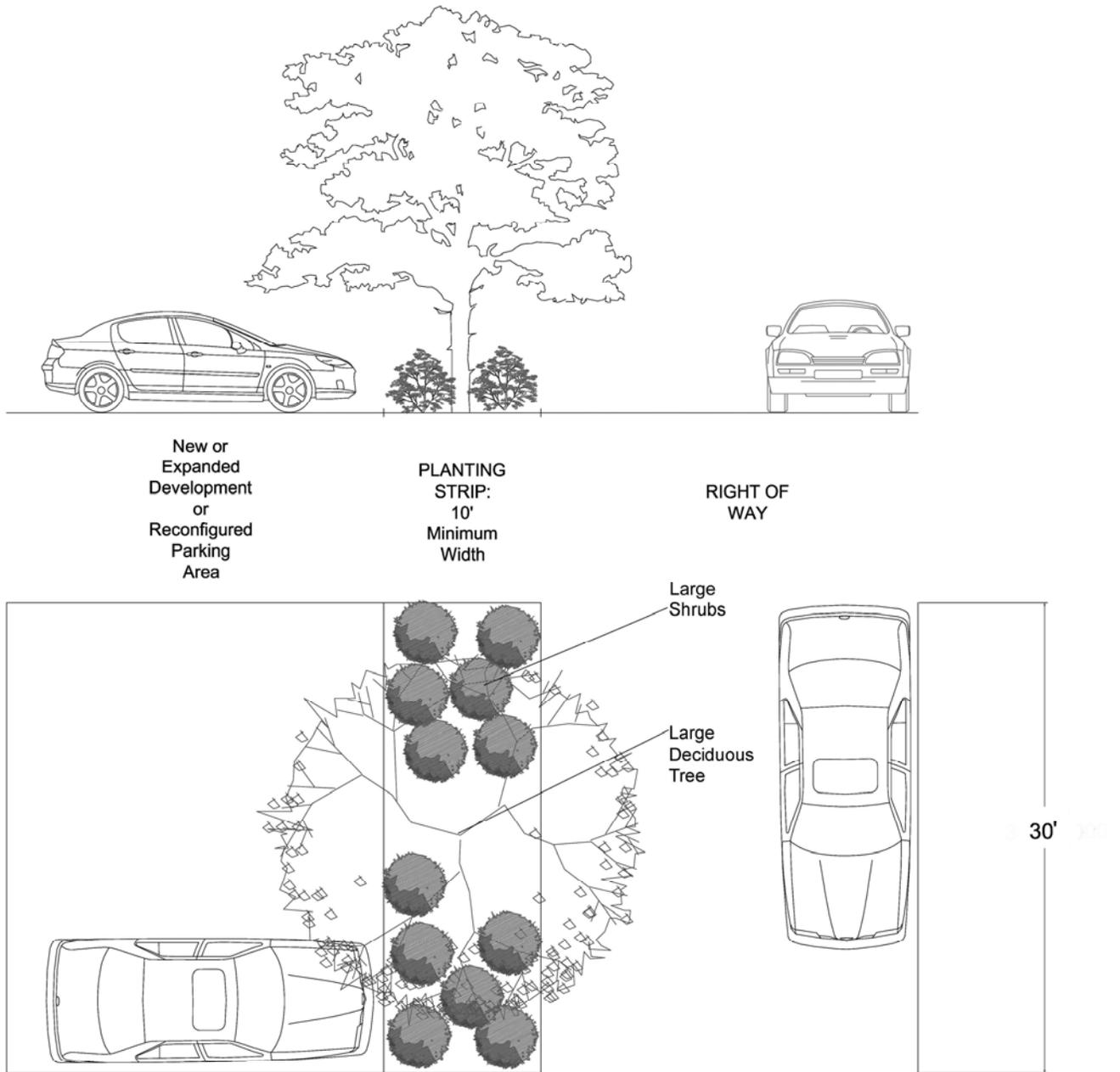


ELEVATION

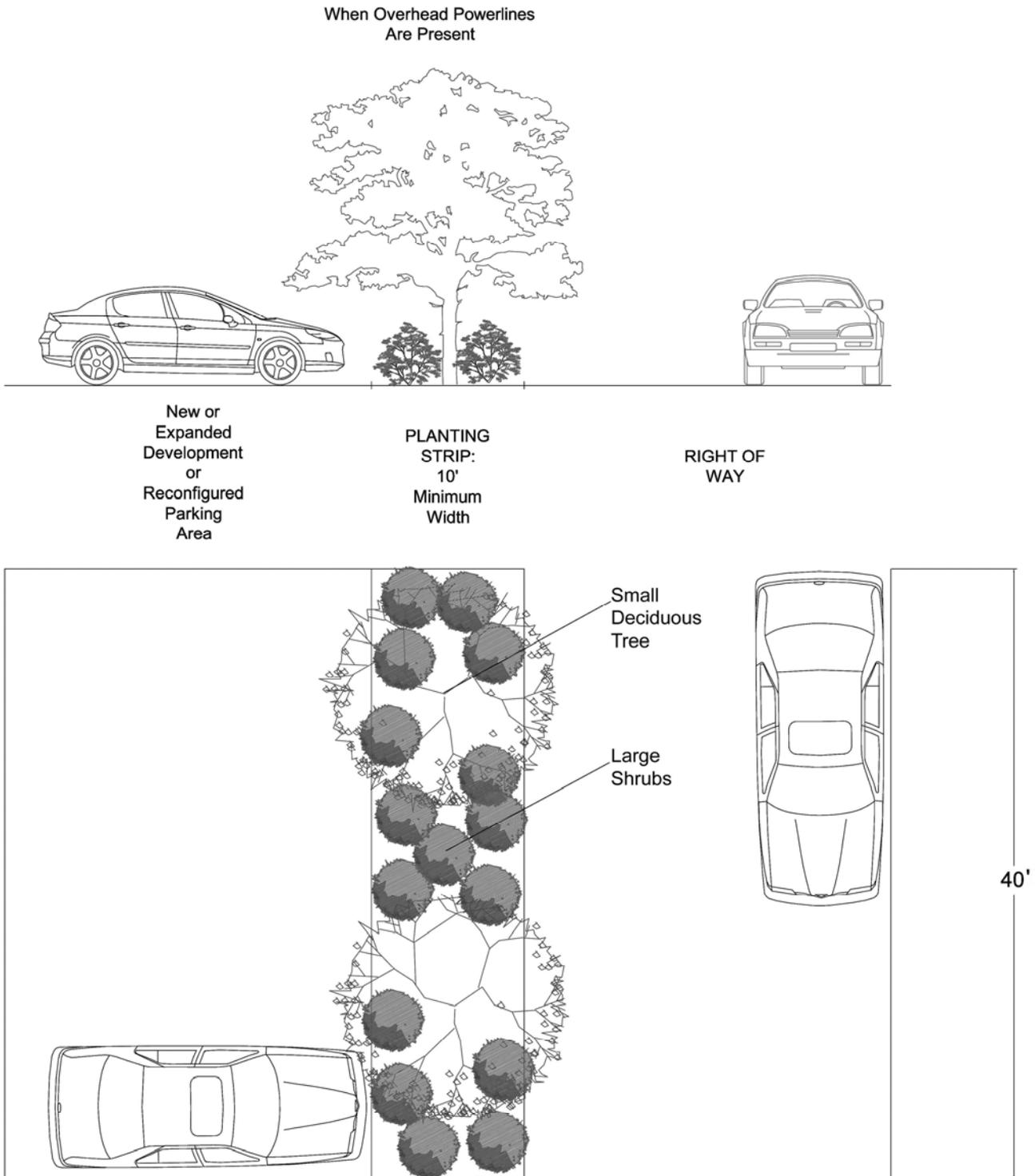


Section 3 – Right-of-Way Planting Strips

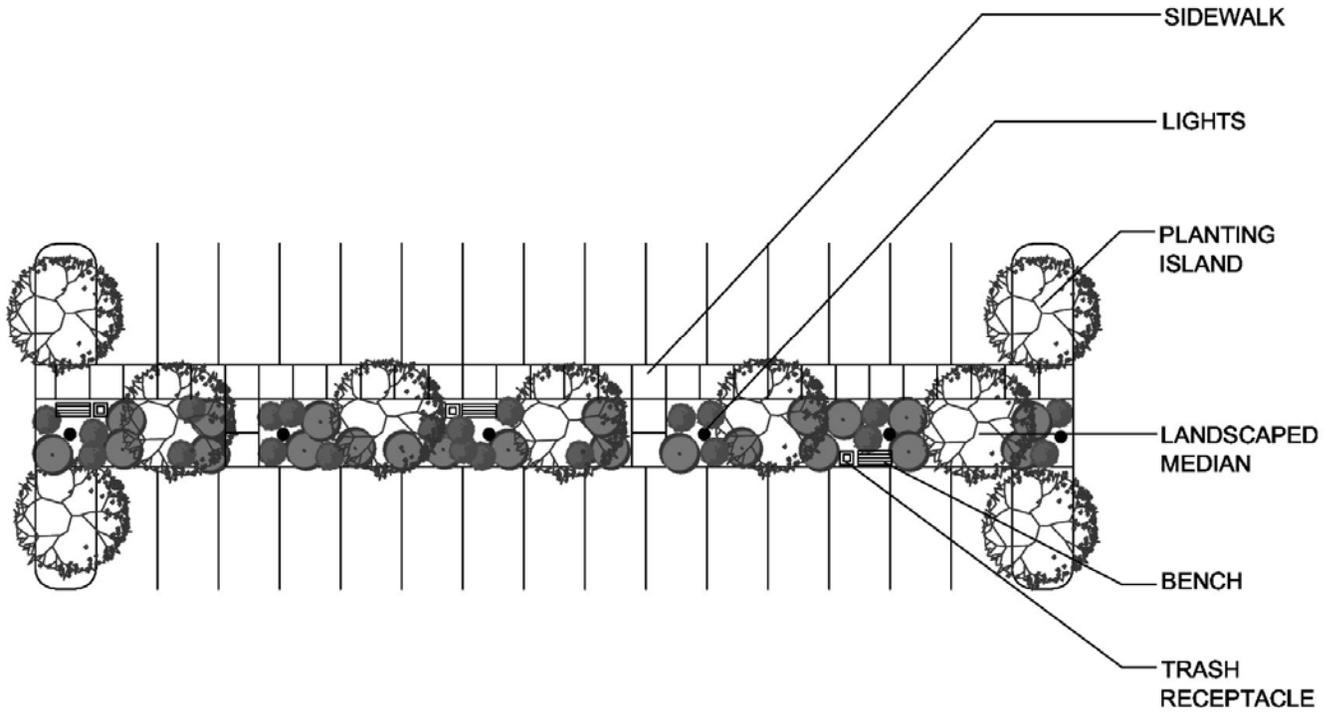
(A) Typical Planting Strip



(B) Planting Strip with Overhead Power Lines



Section 4 – Landscaped Medians within Parking Areas



Section 5 – Recommended Native/Naturalized Plant List

(A) Large Deciduous Trees:

LATIN NAME	COMMON NAME	STREET TREE	SCREENING	PARKING LOT ISLAND	PLANTING STRIP	GENERAL LANDSCAPING
<i>Acer rubrum</i>	Red Maple	X				X
<i>Acer saccharum</i>	Sugar Maple					X
<i>Aesculus flava</i>	Yellow Buckeye					X
<i>Betula alleghensis</i>	Yellow Birch					X
<i>Betula lenta</i>	Sweet Birch					X
<i>Betula nigra</i>	River Birch					X
<i>Carya glabra</i>	Pignut Hickory					X
<i>Diospyros virginiana</i>	Persimmon					X
<i>Fagus grandifolia</i>	American Beech					X
<i>Fraxinus americana</i>	White Ash	X				X
<i>Fraxinus pensylvanica</i>	Green Ash	X				X
<i>Liquidambar styraciflua</i>	Sweetgum					X
<i>Liriodendron tulipifera</i>	Tulip Poplar					X
<i>Magnolia acuminata</i>	Cucumber Magnolia	X				X
<i>Nyssa sylvatica</i>	Black Gum	X				X
<i>Prunus serrulata</i>	Oriental Cherry					X
<i>Quercus alba</i>	White Oak					X
<i>Quercus coccinea</i>	Scarlet Oak					X
<i>Quercus falcate</i>	Southern Red Oak					X
<i>Quercus palustris</i>	Pin Oak					X
<i>Quercus rubra</i>	Red Oak					X
<i>Quercus stellata</i>	Post Oak					X
<i>Quercus velutina</i>	Black Oak					X
<i>Tilia cordata</i>	Littleleaf Linden	X				X
<i>Tilia americana</i>	American Linden					X

(B) *Small Deciduous Trees:*

LATIN NAME	COMMON NAME	STREET TREE	SCREENING	PARKING LOT ISLAND	PLANTING STRIP	GENERAL LANDSCAPING	FLOWERING
<i>Amelanchier arborea</i>	Downy Serviceberry			X	X	X	X
<i>Amelanchier canadensis</i>	Canada Serviceberry			X	X	X	X
<i>Amelanchier laevis</i>	Smooth Serviceberry			X	X	X	X
<i>Asimina triloba</i>	Paw Paw Tree					X	
<i>Cercis canadensis</i>	Eastern Redbud			X	X	X	X
<i>Chionanthus virginicus</i>	Fringetree			X	X	X	X
<i>Cornus alternifolia</i>	Alternate Leaf Dogwood			X	X	X	X
<i>Cornus florida</i>	Flowering Dogwood			X	X	X	X
<i>Crateagus crus-galli</i>	Cockspur Hawthorne		X	X		X	
<i>Crataegus flava</i>	October Hawthorne		X	X		X	
<i>Halesia tetraptera</i>	Carolina Silverbell			X		X	X
<i>Morus rubra</i>	Red Mulberry			X	X	X	
<i>Ostra virginiana</i>	Eastern Hop Hornbeam						
<i>Prunus americana</i>	American Wild Plum		X	X	X	X	X
<i>Rhus glabra</i>	Smooth Sumac		X		X	X	
<i>Salix nigra</i>	Black Willow					X	X
<i>Syringa vulgaris</i>	Common Lilac					X	X

(C) Large Evergreen Trees:

LATIN NAME	COMMON NAME	STREET TREE	SCREENING	PARKING LOT ISLAND	PLANTING STRIP	GENERAL LANDSCAPING
<i>Ilex opaca</i>	American Holly		X			X
<i>Juniperus virginiana</i>	Eastern Red Cedar		X			X
<i>Magnolia grandiflora</i>	Southern Magnolia		X			X
<i>Picea glauca</i>	White Spruce		X			X
<i>Picea abies</i>	Norway Spruce		X			X
<i>Picea orientalis</i>	Oriental Spruce		X			X
<i>Pinus bungeana</i>	Lacebark Pine		X			X
<i>Pinus echinata</i>	Shortleaf Pine		X			X
<i>Pinus koraiensis</i>	Korean Pine		X			X
<i>Pinus virginiana</i>	Virginia Pine		X			X
<i>Thuja occidentalis</i>	White Cedar		X			X
<i>Tsuga canadensis</i>	Eastern Hemlock		X			X
<i>Tsuga caroliniana</i>	Carolina Hemlock		X			X

(D) Large Evergreen Shrubs & Small Evergreen Trees:

LATIN NAME	COMMON NAME	STREET TREE	SCREENING	PARKING LOT ISLAND	PLANTING STRIP	GENERAL LANDSCAPING
<i>Buxus sempervirens</i>	Common Boxwood		X	X	X	X
<i>Camellia oleifera</i>	Tea Oil Camellia					X
<i>Chamaecyparis obtuse</i>	Hinoki Falsecypress			X	X	X
<i>Ilex × attenuate</i>	Foster's Holly		X	X	X	X
<i>Ilex verticillata</i>	Winterberry Holly		X	X	X	X
<i>Juniperus chinensis</i>	Chinese Juniper		X	X	X	X
<i>Magnolia virginiana</i>	Sweet Bay Magnolia					X
<i>Picea glauca 'conica'</i>	Dwarf White Spruce		X	X	X	X
<i>Thuja occidentalis</i>	Eastern Arborvitae		X	X	X	X

(E) Large Deciduous Shrubs:

LATIN NAME	COMMON NAME	STREET TREE	SCREENING	PARKING LOT ISLAND	PLANTING STRIP	GENERAL LANDSCAPING	FLOWERING
<i>Acer palmatum</i>	Japanese Maple					X	
<i>Aronia pyrifolia</i>	Red Chokeberry					X	X
<i>Callicarpa americana</i>	American Beautyberry					X	X
<i>Calycanthus floridus</i>	Eastern Sweetshrub					X	X
<i>Chaenomeles × superb</i>	Flowering Quince				X	X	X
<i>Clethra alnifolia</i>	Summersweet				X	X	X
<i>Cornus amomum</i>	Silky Dogwood			X	X	X	X
<i>Cornus sericea</i>	Redosier Dogwood			X	X	X	X
<i>Cornus alba 'Sibirica'</i>	Tatarian Dogwood			X	X	X	X
<i>Cotinus coggygria</i>	Smokebush				X	X	X
<i>Fothergilla major</i>	Large Fothergilla					X	X
<i>Hydrangea paniculata</i>	Panicle Hydrangea					X	X
<i>Hydrangea quercifolia</i>	Oak Leaf Hydrangea					X	X
<i>Lagerstroemia indica</i>	Crape Myrtle			X	X	X	X
<i>Morella pensylvanica</i>	Northern Bayberry			X	X	X	
<i>Physocarpus opulifolius</i>	Ninebark			X	X	X	
<i>Rhododendron calendulaceum</i>	Flame Azalea			X	X	X	X
<i>Rhododendron</i>	Pinxterbloom Azalea			X	X	X	X
<i>Rhododendron prinophyllum</i>	Roseshell Azalea			X	X	X	X
<i>Rhus aromatic</i>	Fragrant Sumac			X	X	X	
<i>Salix purpurea 'Nana'</i>	Dwarf Purpleosier Willow					X	X
<i>Sambucus nigra 'Variegata'</i>	Variegated Elderberry			X	X	X	X
<i>Spiraea prunifolia</i>	Bridalwreath Spirea			X	X	X	X
<i>Viburnum carlesii</i>	Korean Spice Viburnum			X	X	X	X
<i>Viburnum burkwoodii</i>	Burkwood Viburnum			X	X	X	X
<i>Viburnum juddii</i>	Judd Viburnum			X	X	X	X
<i>Viburnum dentatum</i>	Arrowood Viburnum			X	X	X	X
<i>Viburnum macrocephalum</i>	Large Flowered Chinese			X	X	X	X
<i>Viburnum nudum</i>	Possumhaw Viburnum			X	X	X	X
<i>Viburnum acerifolium</i>	Mapleleaf Viburnum			X	X	X	X
<i>Weigela florida</i>	Flowering Weigela			X	X	X	X

(F) *Groundcover & Small Shrubs (Evergreen & Deciduous):*

LATIN NAME	COMMON NAME	STREET TREE	SCREENING	PARKING LOT ISLAND	PLANTING STRIP	GENERAL LANDSCAPING	FLOWERING
<i>Cotoneaster dammeri</i> 'Coral Beauty'	Coral Beauty Cotoneaster			X		X	X
<i>Festuca glauca</i> 'Boulder Blue'	Boulder Blue Fescue			X		X	
<i>Hosta</i>	Hosta, Plantain Lily					X	X
<i>Hypericum reptans</i>	Creeping St. John's Wort			X	X	X	X
<i>Iberis sempervirens</i> 'Little Gem'	Little Gem Candytuft			X		X	X
<i>Juniperus horizontalis</i>	Creeping Juniper			X		X	
<i>Liriope muscari</i>	Liriope			X		X	
<i>Pachysandra terminalis</i>	Pachysandra			X		X	X
<i>Phlox subulata</i>	Moss Pink			X		X	X
<i>Sedum</i>	Stoncrop			X		X	
<i>Yucca filamentosa</i>	Yucca			X		X	

Section 6 – Highly Invasive Species List

It should be noted the list is not regulatory in nature, and thus does not prohibit the use of the listed plant species.

LATIN NAME	COMMON NAME
<i>Ailanthus altissima</i>	Tree-of-Heaven
<i>Alliaria petiolata</i>	Garlic Mustard
<i>Alternanthera philoxeroides</i>	Alligator Weed
<i>Ampelopsis brevipedunculata</i>	Porcelain-Berry
<i>Carex kobomugi</i>	Asiatic Sand Sedge
<i>Celastrus orbiculata</i>	Oriental Bittersweet
<i>Centaurea dubia</i>	Short-Fringed Knapweed
<i>Centaurea biebersteinii</i>	Spotted Knapweed
<i>Cirsium arvense</i>	Canada Thistle
<i>Dioscorea oppositifolia</i>	Chinese Yam
<i>Elaeagnus umbellata</i>	Autumn Olive
<i>Euonymus alata</i>	Winged Burning Bush
<i>Hydrilla verticillata</i>	Hydrilla
<i>Imperata cylindrica</i>	Cogon Grass
<i>Lespedeza cuneata</i>	Chinese Lespedeza
<i>Ligustrum sinense</i>	Chinese Privet
<i>Lonicera japonica</i>	Japanese Honeysuckle
<i>Lonicera morrowii</i>	Morrow's Honeysuckle
<i>Lonicera standishii</i>	Standish's Honeysuckle
<i>Lythrum salicaria</i>	Purple Loosestrife
<i>Microstegium vimineum</i>	Japanese Stilt Grass
<i>Murdannia keisak</i>	Aneilema
<i>Myriophyllum aquaticum</i>	Parrot Feather
<i>Myriophyllum spicatum</i>	European Water-Milfoil
<i>Phragmites australis</i>	Common Reed
<i>Polygonum cuspidatum</i>	Japanese Knotweed
<i>Polygonum perfoliatum</i>	Mile-A-Minute
<i>Pueraria montana</i>	Kudzu Vine
<i>Ranunculus ficaria</i>	Lesser Celandine
<i>Rosa multiflora</i>	Multiflora Rose
<i>Rubus phoenicolasius</i>	Wineberry
<i>Sorghum halepense</i>	Johnson-Grass

Section 7 – Native Plant Guide for Stormwater Management Areas in the Mid-Atlantic, USA from the Virginia State Stormwater Management Handbook, Volume 1, Chapter 3

Tree/Shrub	*Zone	Form	Available	Inundation Tolerance	Wildlife Value	Notes
American Beech (<i>Fagus grandifolia</i>)	5,6	Dec. Tree	no	no	High, mammals and birds.	Prefers shade and rich, well-drained soils.
American Holly (<i>Ilex opaca</i>)	5,6	Dec. Tree	yes	some	High, songbirds, food, cover, nesting.	Coastal plain only. Prefers shade and rich soils.
American Hornbeam (<i>Carpinus caroliniana</i>)	4,5	Dec. Tree	yes	yes	Moderate, food, browsing.	Most common in flood plains and bottom land of Piedmont and mountains.
Arrowwood Viburnum (<i>Viburnum dentatum</i>)	2,3,4	Dec. Shrub	yes	no	High, songbirds and mammals.	Grows best in sun to partial shade.
Bald Cypress (<i>Taxodium distichum</i>)	3,4	Dec. Tree	yes	yes	Little food value but good perching site for waterfowl.	Forested Coastal Plain wetlands. North of normal range. Tolerates drought.
Bayberry (<i>Myrica pensylvanica</i>)	4,5,6	Dec. Shrub	yes	no	High, nesting, food cover. Berries last into winter.	Coastal Plain only. Roots fix N. Tolerates slightly acidic soil.
Bitternut Hickory (<i>Carya cordiformis</i>)	3,4,5	Dec. Tree	no	yes	High, food.	Moist soils or wet bottom land areas.
Black Cherry (<i>Prunus serotina</i>)	5,6	Dec. Tree	yes	yes	High, fruit is eaten by many birds.	Temporarily flooded forested areas. Possible fungus infestation.
Black Walnut (<i>Juglans nigra</i>)	5,6	Dec. Tree	yes	yes	High, food.	Temporarily flooded wetlands along flood plains. Well drained, rich soils.
Blackgum or Sourgum (<i>Nyssa sylvatica</i>)	4,5,6	Dec. Tree	yes	yes	High, songbirds, egrets, herons, raccoons, owls.	Can be difficult to transplant. Prefers sun to partial shade.
Black Willow (<i>Salix nigra</i>)	3,4,5	Dec. Tree	yes	yes	High, browsing and cavity nesters.	Rapid growth, stabilizes stream banks. Full sun.
Buttonbush (<i>Cephalanthus occidentalis</i>)	2,3,4,5	Dec. Shrub	yes	yes	High, ducks and shorebirds. Seeds, nectar and nesting.	Full sun to partial shade. Will grow in dry areas.
Chestnut Oak (<i>Quercus prinus</i>)	5,6	Dec. Tree	no	no	High. Cover, browse and food.	Gypsy moth target. Dry soils.
Common Choke Cherry (<i>Prunus virginiana</i>)	5,6	Dec. Tree	no	some	High, birds, mammals. Fruit and cover.	Prefers drier conditions.
Common Spicebush (<i>Lindera benzoin</i>)	4,5	Dec. Shrub	yes	no	Very high, songbirds.	Shade and rich soils. Tolerates acidic soils. Good understory species.

Tree/Shrub (continued)	*Zone	Form	Available	Inundation Tolerance	Wildlife Value	Notes
Eastern Cottonwood (Populus deltoides)	4,5	Dec. Tree	yes	yes	Moderate, cover, food.	Shallow rooted, subject to windthrow. Invasive roots. Rapid growth.
Eastern Hemlock (Tsuga canadensis)	5,6	Conif. Tree	yes	yes	Moderate. Mostly cover and some food.	Tolerates all sun/shade conditions. Tolerates acidic soil.
Eastern Red Cedar (Juniperus virginiana)	4,5,6	Conif. Tree	yes	no	High. Fruit for birds. Some cover.	Full sun to partial shade. Common in wetlands, shrub bogs and edge of streams.
Elderberry (Sambucus canadensis)	4,5,6	Dec. Shrub	yes	yes	Extremely high for food and cover, for birds and mammals.	Full sun to partial shade.
Flowering Dogwood (Cornus florida)	4,5,6	Dec. Tree	no	yes	High, birds, food.	Prefers rich, moist soils. Dogwood anthracnose possible problem.
Fringe Tree (Chionanthus virginicus)	3,4,5	Dec. Shrub or small tree	yes	some	Moderate. Food and cover.	Full sun to partial shade. Tolerates acidic soil.
Green Ash, Red Ash (Fraxinus pennsylvanica)	4,5	Dec. Tree	yes	yes	Moderate, songbirds.	Rapid growing stream bank stabilizer. Full sun to partial shade.
Hackberry (Celtis occidentalis)	5,6	Dec. Tree	yes	yes	High, food and cover.	Full sun to partial shade.
Ironwood/Hophornbeam (Ostrya virginiana)	5,6	Dec. Tree	yes	yes	Moderate, food and browse.	Tolerant of all sunlight conditions.
Larch, Tamarack (Larix laricina)	3,4	Conif. Tree	no	yes	Low, nest tree and seeds.	Rapid initial growth. Full sun, acidic boggy soils.
Loblolly Pine (Pinus taeda)	5,6	Conif. Tree	yes	yes	Moderate, food, nesting, squirrels.	Coastal Plain only. Tolerant of extreme soil conditions.
Mountain Laurel (Kalmia latifolia)	6	Evergreen	no	some	Low, cover, and nectar. Foliage is toxic to cattle and deer.	Partial shade, acidic soils.
Persimmon (Diospyros virginiana)	4,5,6	Dec. Tree	yes	no	Extremely high, birds, mammals.	Not shade tolerant. Well-drained soils.
Pin Oak (Quercus palustris)	4,5,6	Dec. Tree	yes	yes	High, mast. Tolerates acidic soil.	Gypsy moth target. Prefers sun to partial shade.
Red Chokeberry (Pyrus arbutifolia)	3,4,5	Dec. Shrub	no	yes	Moderate, songbirds.	Bank stabilizer. Partial sun.
Red Maple (Acer rubrum)	4,5,6	Dec. Tree	yes	yes	High, seeds and browse. Tolerates acidic soil.	Rapid growth.
Red Oak (Quercus rubra)	5,6	Dec. Tree	yes	no	High, food and cover.	Gypsy moth target. Prefers well drained, sandy soils.

Tree/Shrub (continued)	*Zone	Form	Available	Inundation Tolerance	Wildlife Value	Notes
River Birch (Betula nigra)	3,4	Dec. Tree	yes	yes	Low, but good for cavity nesters.	Bank erosion control. Full sun.
Scarlet Oak (Quercus coccinea)	3,4	Dec. Tree	no	no	High, food and cover.	Gypsy moth target. Difficult to transplant.
Shadbush, Serviceberry (Amelanchier canadensis)	5,6	Dec. Tree	yes	yes	High, nesting, cover and food. Birds and mammals.	Prefers partial shade. Common in forested wetlands and upland woods.
Silky Dogwood (Cornus amomum)	5,6	Dec. Shrub	yes	yes	High, songbirds, mammals.	Shade and drought tolerant. Good bank stabilizer.

Wetland Plants	*Zone	Form	Available	Inundation Tolerance	Wildlife Value	Notes
Arrow arum (Peltandra virginica)	2	Emergent	yes	up to 1 ft.	High, berries are eaten by wood ducks.	Full sun to partial shade.
Arrowhead/Duck potato (Sagittaria latifolia)	2	Emergent	yes	up to 1 ft.	Moderate, tubers and seeds eaten by ducks.	Aggressive colonizer.
Broomsedge (Andropogon virginianus)	2,3	Perimeter	yes	up to 3 in.	High, songbirds and browsers. Winter food and cover.	Tolerant of fluctuating water levels and partial shade.
Cattail (Typha spp.)	2,3	Emergent	yes	up to 1 ft.	Low, except as cover.	Aggressive. May eliminate other species. Volunteer. High pollutant treatment.
Coontail (Ceratophyllum demersum)	1	Submergent	no	yes	Low, food, good habitat and shelter for fish and invertebrates.	Free floating SAV. Shade tolerant. Rapid growth.
Common Three Square (Scipus pungens)	2	Emergent	yes	up to 6 in.	High, seeds, cover, waterfowl, songbirds.	Fast colonizer. Can tolerate periods of dryness. Full sun. High metal removal.
Duckweed (Lemna sp.)	1,2	Submergent /Emergent	yes	yes	High, food for waterfowl and fish.	May biomagnify metals beyond concentrations found in water.
Lizard's Tail (Saururus cernuus)	2	Emergent	yes	up to 1 ft.	Low, except wood ducks.	Rapid growth. Shade tolerant.
Marsh Hibiscus (Hibiscus moscheutos)	2,3	Emergent	yes	up to 3 in.	Low, nectar.	Full sun. Can tolerate periodic dryness.
Pickerelweed (Pontederia cordata)	2,3	Emergent	yes	up to 1 ft.	Moderate, ducks, nectar for butterflies.	Full sun to partial shade.

Wetland Plants (continued)	*Zone	Form	Available	Inundation Tolerance	Wildlife Value	Notes
Pond Weed (Potamogeton pectinatus)	1	Submergent	yes	yes	Extremely high, waterfowl, marsh and shore-birds.	Removes heavy metals.
Rice Cutgrass (Leersia oryzoides)	2,3	Emergent	yes	up to 3 in.	High, food and cover.	Full sun, although tolerant of shade. Shoreline stabilization.
Sedges (Carex spp.)	2,3	Emergent	yes	up to 3 in.	High, waterfowl, songbirds.	Many wetland and several upland species.
Soft-stem Bulrush (Scirpus validus)	2,3	Emergent	yes	up to 1 ft.	Moderate, good cover and food.	Full sun. Aggressive colonizer. High pollutant removal.
Smartweed (Polygonum spp.)	2	Emergent	yes	up to 1 ft.	High, waterfowl, songbirds, seeds and cover.	Fast colonizer. Avoid weedy aliens such as P. Perfoliatum.
Spatterdock (Nuphar luteum)	2	Emergent	yes	up to 1.5 ft.	Moderate, for food but high for cover.	Fast colonizer. Tolerant of fluctuating water levels.
Switchgrass (Panicum virgatum)	2,3,4, 5,6	Perimeter	yes	up to 3 in.	High, seeds, cover. Waterfowl, songbirds.	Tolerates wet/dry conditions.
Sweet Flag (Acorus calamus)	2,3	Perimeter	yes	up to 3 in.	Low, tolerant of dry periods.	Tolerates acidic conditions. Not a rapid colonizer.
Waterweed (Elodea canadensis)	1	Submergent	yes	yes	Low.	Good water oxygenator. High nutrient, copper, manganese and chromium removal.
Wild Celery (Valisneria americana)	1	Submergent	yes	yes	High, food for waterfowl. Habitat for fish and invertebrates.	Tolerant of murkey water and high nutrient loads.
Wild Rice (Zizania aquatica)	2	Emergent	yes	up to 1 ft.	High, food. Birds.	Prefers full sun.

Zone 1: Submergent Aquatic Vegetation

Zone 2: Shallow Water Bench - 6-12 inches Deep

Zone 3: Shoreline Fringe - Regularly Inundated Area

Zone 4: Riparian Fringe - Periodically Inundated Area, Wet Soils

Zone 5: Floodplain Terrace - Infrequently Inundated, Moist Soils

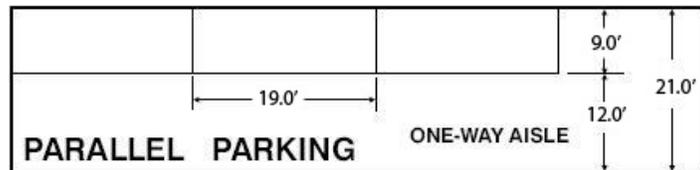
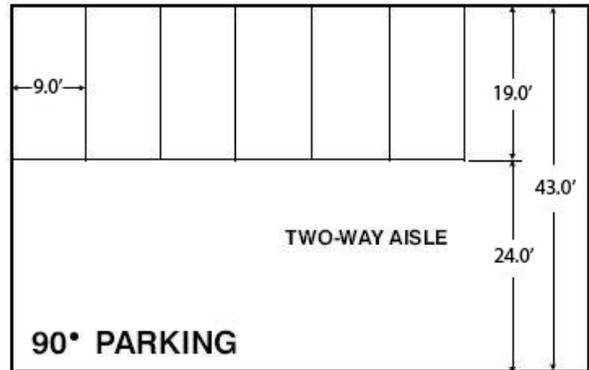
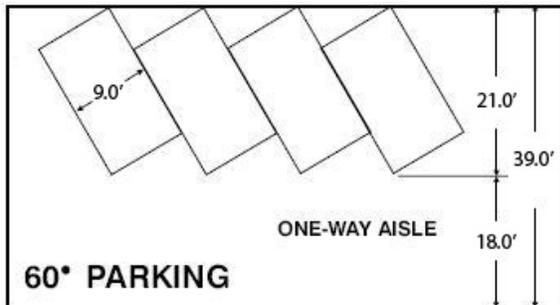
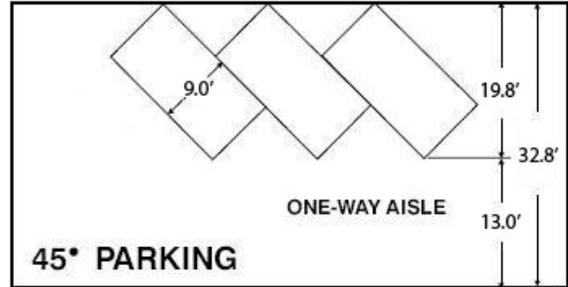
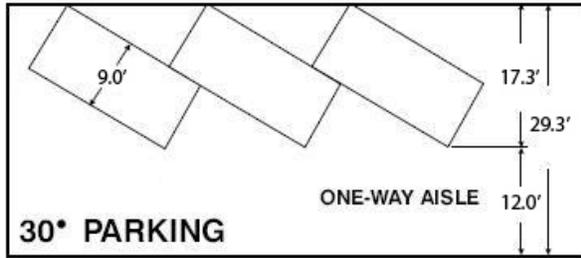
Zone 6: Upland Slopes - Seldom or Never Inundated, Moist To Dry Soils

Chapter 3: Transportation

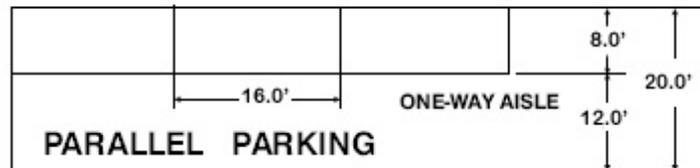
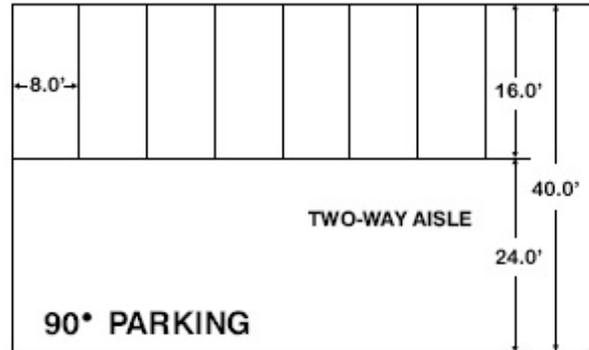
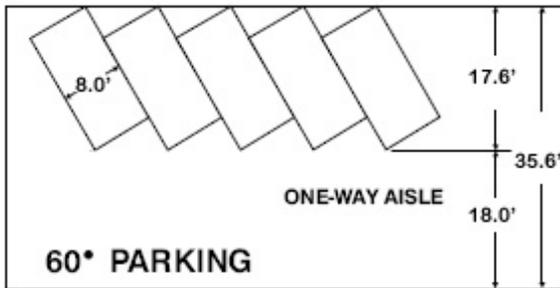
Section 1 – Parking Area Design

(A) Automobile Parking Diagrams and Dimensions

1. Standard Parking Spaces



2. Compact Parking Spaces



(B) Bicycle Parking

1. Bicycle Parking Table

Impervious Spaces Provided	Bicycle Spaces Required*	Extra Bicycle Spaces Provided	Total Bicycle Spaces Provided	Maximum Impervious Space Reduction** (Extra Spaces / 4)
20	0	4	4	1
50	3	4	7	1
75	4	12	16	3
100	5	20	25	5
150	8	28	36	7
200	10	40	50	10
250	13	48	61	12
300	15	60	75	15
350	18	68	86	17
400	20	90	110	20

*No more than 20 bicycle spaces shall be required

** The number of impervious spaces that can be reduced is calculated by dividing the extra bicycle spaces provided by four. Impervious vehicular parking spaces reduced shall not exceed 5% of the total impervious spaces provided.

2. Bicycle Sign Examples



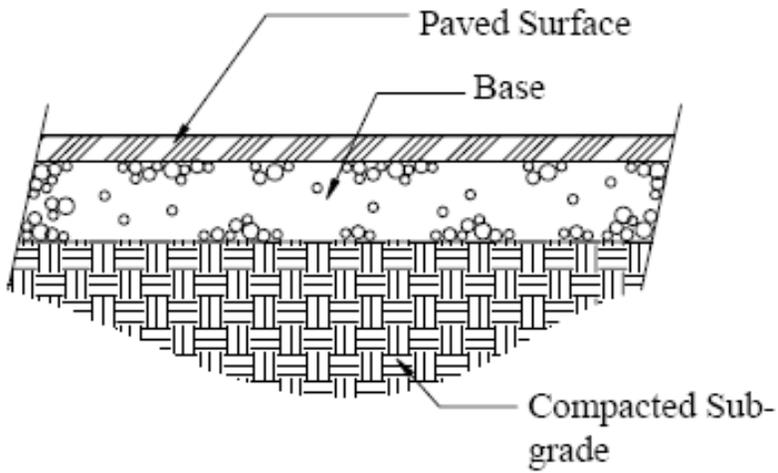
3. Bicycle Rack Recommendations

- a. The bicycle rack is intended to;
 - i. Support the bicycle upright by at least two points of contact;
 - ii. Prevent the wheel of the bicycle from tipping over;
 - iii. Enable the frame and one or both of the wheels to be secured;
 - iv. Accommodate a U-Shaped locking device, or
 - v. Lock the frame and both wheels to the rack with a chain or cable not longer than six (6) feet.



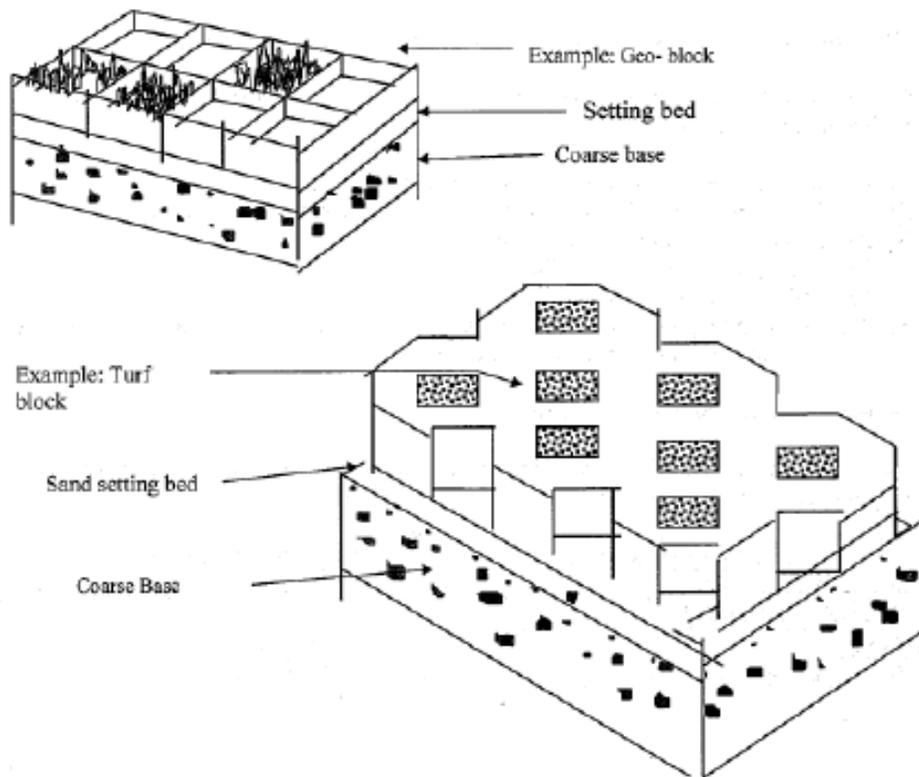
Section 2 – Typical Paving

(A) Impervious Pavement Cross-Section

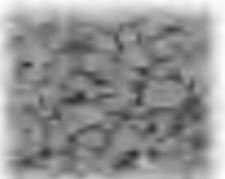


Section 3 – Permeable Paving

(A) Permeable Paver Cross-Section



(B) Examples of Permeable Pavement Surfaces:

Permeable Surface	Description	Applications	Limitations	Maintenance
<p>Permeable Interlocking Concrete Pavers (PICP)</p> 	<p>Cast-in-place systems or modular pre-cast blocks that have wide joints or openings that are filled with gravel or soil and grass.</p>	<ul style="list-style-type: none"> • Low volume drive areas • Overflow parking • Parking pads • Residential parking • Recreational trails • Pedestrian paths 	<ul style="list-style-type: none"> • Performance depends on site conditions. • Not applicable for high-traffic areas or for use by heavy traffic vehicles 	<ul style="list-style-type: none"> • Periodically add joint material to replace material that has been moved/worn down by traffic and/or weather • Easy to repair, since units are easily lifted and reset
<p>Concrete Grid Pavers</p> 	<p>Pavement surface consisting of strong structural materials having regularly interspersed void areas which are filled with pervious materials, such as sod, gravel or sand.</p>	<ul style="list-style-type: none"> • Low volume drive areas • Overflow parking • Parking pads • Residential parking • Recreational trails • Pedestrian paths • Emergency vehicle and fire access lanes 	<ul style="list-style-type: none"> • System must be designed with an overflow or lateral release from the storage bed • Performance depends on site conditions. • Not applicable for high-traffic areas or for use by heavy traffic vehicles 	<ul style="list-style-type: none"> • Periodically add joint material to replace material that has been moved/worn down by traffic and/or weather • Easy to repair, since units are easily lifted and reset
<p>Permeable Asphalt</p>  <p>Source: Blue-GreenBuilding.org</p>	<p>Consists of fine and course aggregate stone bound by a bituminous-based binder. The amount of fine aggregate is reduced creating larger void spaces which allow water to infiltrate.</p>	<ul style="list-style-type: none"> • Low volume drive areas • Overflow parking • Parking pads • Residential parking • Recreational trails • Pedestrian paths • Emergency vehicle and fire access lanes 	<ul style="list-style-type: none"> • Application must be large enough to be cost effective for supplier to mix material • System must be designed with an overflow or lateral release from the storage bed 	<ul style="list-style-type: none"> • Annual vacuum sweeping or high pressure hosing required to maintain function
<p>Porous Concrete</p>  <p>Source: Blue-GreenBuilding.org</p>	<p>Mixture of Portland cement, fly ash, washed gravel and water. Similar to standard pavement in aesthetics and load bearing capacity, but the fine material has been reduced or eliminated in the mix resulting in the formation of channels that allow water to infiltrate.</p>	<ul style="list-style-type: none"> • Low volume drive areas • Overflow parking • Parking pads • Residential parking • Recreational trails • Pedestrian paths • Emergency vehicle and fire access lanes 	<ul style="list-style-type: none"> • Application must be large enough to be cost effective for supplier to mix material • System must be designed with an overflow or lateral release from the storage bed 	<ul style="list-style-type: none"> • Annual vacuum sweeping or high pressure hosing required to maintain function

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(C) Examples of Permeable Pavement Applications:



Modular Concrete Pavers



Parking Lot with Porous Surface



Overflow Parking Area



Concrete Paver Driveway



Low Use Parking Area



Plastic Lattice Turf Pavement

Chapter 4: Other Features

Appendix

Section 1 – Board of Supervisors Ordinance 052609-23

AT A REGULAR MEETING OF THE BOARD OF SUPERVISORS OF ROANOKE COUNTY, VIRGINIA, HELD AT THE ROANOKE COUNTY ADMINISTRATION CENTER ON TUESDAY, MAY 26, 2009

ORDINANCE 052609-23 AUTHORIZING THE DEVELOPMENT AND ADOPTION OF A DESIGN HANDBOOK TO ASSIST IN THE IMPLEMENTATION OF VARIOUS FEATURES FOR CHAPTER 30 OF THE ROANOKE COUNTY CODE (ZONING ORDINANCE)

WHEREAS, the public necessity, convenience, general welfare and good zoning practice requires the amendment to Chapter 30 of the Roanoke County Code (Zoning Ordinance) by the adoption of a Design Handbook; and,

WHEREAS, this Design Handbook provides graphic illustrations and diagrams of various elements and features of the Zoning Ordinance, including site design, landscaping, screening and buffering, transportation, parking, and other features; and,

WHEREAS, the Planning Commission held a public hearing on this ordinance on April 7, 2009; and,

WHEREAS, the Board of Supervisors held a first reading on this ordinance on May 12, 2009, and a second reading and public hearing on May 26, 2009.

BE IT ORDAINED By the Board of Supervisors of Roanoke County, Virginia, as follows:

1. That there is hereby established a Design Handbook for the County of Roanoke Zoning Ordinance.

2. That the County of Roanoke will utilize the policy, criteria and information including specifications and standards of the County of Roanoke Design Handbook for the proper implementation of the requirements of the Zoning Ordinance. This document shall include illustrations and diagrams of acceptable elements and features, including the specific design criteria for various amenities, improvements and features.

3. That the County of Roanoke Design Handbook may be updated and revised from time to time, based on improvements in design, landscaping, engineering, science, monitoring and local maintenance experience. The Planning Commission may recommend and the Board of Supervisors shall authorize and approve any updates, supplements, or modifications to the County of Roanoke Design Handbook by Resolution.

4. That the elements, amenities, improvements and features that are designed and constructed in accordance with these design criteria will be presumed to meet the minimum zoning ordinance performance standards.

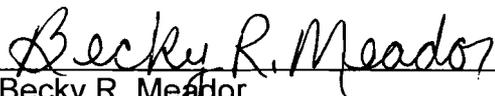
5. That this ordinance shall be in effect from and after the date of its adoption.

On motion of Supervisor Moore to adopt the ordinance, and carried by the following recorded vote:

AYES: Supervisors Moore, Church, Flora, McNamara, Altizer

NAYS: None

A COPY TESTE:


Becky R. Meador
Deputy Clerk to the Board

c: Circuit Court
Robert P. Doherty, Jr., Judge
James R. Swanson, Judge
Steven A. McGraw, Clerk
Bonnie Hager, Judicial Secretary
Norce Lowe, Secretary

Juvenile Domestic Relations District Court
Doris J. Johnson, Clerk (for distribution)

General District Court

Vincent A. Lilley, Judge

Theresa A. Childress, Clerk (for distribution)

Gerald Holt, Sheriff

Kevin Hutchins, Treasurer

Nancy Horn, Commissioner of Revenue

Paul Mahoney, County Attorney

Randy Leach, Commonwealth Attorney

Chief Magistrate Raymond Leven

Diana Rosapepe, Director of Library Services

Ray Lavinder, Police Chief

Richard Burch, Chief of Fire & Rescue

Roanoke Law Library, 315 Church Avenue, S.W., Rke 24016

Roanoke County Law Library, Singleton Osterhoudt

Roanoke County Code Book

B. Clayton Goodman, III, County Administrator

John M. Chambliss, Jr., Assistant County Administrator

Dan O'Donnell, Assistant County Administrator

Diane D. Hyatt, Chief Financial Officer

Arnold Covey, Director of Community Development

Tarek Moneir, Deputy Director of Development Services

Philip Thompson, Deputy Director of Planning

Rebecca Owens, Director of Finance

David Davis, Court Services

Elaine Carver, Chief Information Officer

Bill Greeves, Director of Information Technology

Anne Marie Green, Director of General Services

Pete Haislip, Director of Parks, Recreation & Tourism

William E. Driver Director of Real Estate Valuation

Brent Robertson, Director of Management & Budget