

Draft

**Standards and Guidelines
for
LANDSCAPING
and
TREE PRESERVATION**



Columbia, Missouri
2023

Table of Contents

- Landscape Plan Checklist- pg. 3
- Tree Preservation Plan Checklist- pg. 3
- 29-4.4(d) Street frontage landscaping- pg. 4
- 29-4.4(e) Property edge buffering- pg. 5
- 29-4.4(g) Preservation of existing landscaping- pg. 6
- Columbia Approved Tree Species- pg. 7
- Plan Details and Specifications- pg. 11
- Definitions- pg. 14

Landscape Plan Checklist

All plans should contain the following information:

- (a) North arrow and scale
- (b) Zoning for the proposed development and adjacent properties
- (c) Location of existing and proposed structures
- (x) Calculations showing compliance with Section 29-4.4
- (d) A planting schedule detail containing common and botanical plant names, sizes, and graphical depictions
- (f) The number, spacing, size and species of planting materials, including new trees and final ground cover that will be planted as part of the landscaping plan
- (g) Provisions for watering, soil stabilization, plant protection and maintenance
- (e) Number of parking spaces and parking lot size in square feet (include driveways and paved access areas)
- (h) Pervious area in square feet created for tree planting in parking lot islands, when present

Tree Preservation Plan Checklist

All plans should contain the following information:

- (a) North arrow and scale
- (b) Property size in acres/square feet
- (c) Zoning for the proposed development and adjacent properties
- (d) Existing contours at no greater than 5-foot intervals
- (e) Limits of all wetlands and the location of the 100-year flood plain
- (f) Location of existing and proposed structures
- (g) Locations of all existing and proposed roads and right-of-way
- (h) Locations, species and size of any significant tree (20" DBH or greater)
- (i) Location and areas in square feet of climax forest
- (j) Location and area in square feet of climax forest to be preserved
- (k) The size and location of any walls, earth berms and fences
- (l) Location and description of barriers to be erected to protect any vegetation from damage both during and after construction (detail standard is provided)

UDC Reference

This section is intended for quick reference to commonly used articles of code. For applicability and detailed information please refer to the Code Of Ordinances City of Columbia, Missouri.

Sec. 29-4.4. - Landscaping, screening, and tree preservation

29-4.4(d) *Street frontage landscaping*

(1) *Landscaping strip within private yards.* All paved areas with more than forty (40) feet of length within twenty-five (25) feet of a street right-of-way shall have at least a six-foot wide landscaped buffer which shall be improved in accordance with the provisions of section 29-4.4(e)(2) within private yards separating parking areas from abutting street right-of-way.

(2) *Street trees.* Street tree landscaping shall be installed on both sides of any right-of-way greater than fifty (50) feet in width that is newly platted, or is improved with new roadway construction, or is redeveloped, as defined herein, pursuant to the following provisions and in accordance with [chapter 24](#), article V of the City Code:

(i) One street tree shall be required for every sixty (60) feet of street frontage.

(ii) A mixture of street trees (large, medium, small) shall be proposed from the list of approved street trees as identified within the "Standards and Guidelines for Landscaping and Tree Preservation" as promulgated by the director of public works and on file within the public works department for review and approval by the city arborist.

(iii) No more than thirty (30) percent of the required trees may be from one tree species.

(iv) Required street trees shall generally be planted at intervals of at least sixty (60) feet on center; however, trees may be clustered and placed at uneven intervals upon approval of the city arborist when it is determined that such placement will address unique site conditions impacting public health, safety and welfare. In no instance shall the number of required street trees be reduced unless otherwise provided for within this code.

(v) Soil amendments shall be required when street trees are located within tree lawns (the space between back of curb and face of sidewalk) where compacted soils are a limiting factor to tree survivability. Acceptable soil amendments are identified within the "Standards and Guidelines for Landscaping and Tree Preservation" as promulgated by the director of public works and on file within the public works department. The owner may request waiver of such soil amendments upon submission of documentation to the city arborist that the soil within a tree lawn is not compacted and will be suitable for tree survival. Waiver of soil amendments shall be in the sole discretion of the city arborist. *(see Plan Details and Specifications below)*

(vi) Street trees may not be counted towards compliance with all other provisions of [section 29-4.4](#).

(vii) When the planting of street trees on both sides of a newly constructed, newly platted, or redeveloped right-of-way is not possible as a result of a conflict in meeting the buried utility separation requirements of [chapter 24](#), article V, street trees shall only be required on the opposite side of the right-of-way from where the conflict with the buried utility has occurred and the total number of required trees may be reduced.

(viii) The requirements of this subsection shall not apply to previously platted lots, as defined within [section 29-1.11](#), that have frontage upon an existing improved right-of-way; provided, however, street trees shall be required when redevelopment of the right-of-way upon which those lots or parcels are located is proposed and the following criteria are met:

1. A re-subdivision plat is proposed to adjust the lot or parcel lines of lots or parcels located on both sides of the right-of-way; and
2. The re-subdivision plat incorporates no less than fifty (50) percent of the linear feet of block frontage, on both sides of the right-of-way.

29-4.4(e) ***Property edge buffering***

(1) ***Buffering required.*** Where a property contains at least ten thousand (10,000) square feet of area or more than one thousand five hundred (1,500) square feet of paved area or any vehicle loading/unloading areas, buffering shall be installed as required by Table 4.4-4. (Refer to Code for table)

(2) ***Landscape buffer location and design.***

(i) The required landscape buffer shall be installed on the applicant's side of the screening device.

(ii) It shall be designed so that at least eighty (80) percent opacity is achieved, viewed horizontally, in the space between one foot and five (5) feet above grade at the screen line, at the time of installation.

(iii) The landscape buffer shall include the following plant mix:

- (A) Four (4) of the categories of planting material contained in [section 29-4.4\(c\)\(6\)](#) and the guidelines for landscaping and screening, or as approved by the city arborist;
- (B) One tree with a two-inch caliper that is ten (10) feet in height at the time of installation for each two hundred (200) square feet of buffer area; and
- (C) Shrubs and flowering plants that cover a minimum of fifty (50) percent of the remaining area with a minimum of twenty-five (25) percent of that plant material being in flowering shrubs.

29-4.4(g) ***Preservation of existing landscaping***

(3) *Significant trees*

(i) Twenty-five (25) percent of significant trees shall be preserved during development or redevelopment. All vacant and undeveloped land and all property to be redeveloped, including additions and alterations that require a land disturbance permit, shall abide by this section. A "significant tree" means a tree that is not diseased, dying, or of a noxious invasive species and that is at least twenty (20) inches diameter at breast height (DBH) for a deciduous tree that is located outside of the tree preservation and stream buffer or utility easement.

(ii) When a significant tree is removed, the property owner shall replace such tree(s) on the lot as follows:

- a. A significant deciduous tree that is removed shall be replaced by three (3) large to medium deciduous trees, each with a minimum size at planting of two (2) inches caliper.
- b. A significant coniferous tree that is removed shall be replaced by two (2) coniferous trees, each with a minimum height at planting of eight (8) feet.
- c. In lieu of planting replacement trees a payment of seven hundred fifty dollars (\$750.00) per tree can be paid to the City of Columbia right-of-way landscaping planting budget for planting of public street trees.
- d. Replacement trees shall be maintained by the property owner for at least three (3) years.

(iii) Exceptions. Plants that create a public nuisance, as determined by the city arborist, are not protected by the provision of this section.

(4) *Tree and vegetation protection during and after construction*

(i) Tree protection shall be required prior to and during site disturbance and construction activities. No activities with the potential of causing damage to the root systems of trees shall be allowed within twenty (20) feet outside the drip line of the trees being preserved, protected or planted as part of the landscaping or tree preservation plan.

(ii) An orange construction fence or an equivalent shall be installed and "Tree Preservation - Keep Out" signs shall be posted every one hundred (100) feet along the perimeter of the tree preservation area, and the fencing and signs shall be maintained for the duration of all site disturbance and construction activities. *(see Plan Details and Specifications below)*

(iii) If site grading occurs within twenty (20) feet of the tree preservation area, the perimeter of the area must be trenched to a minimum width of two (2) feet and a minimum depth of two (2) feet. Tree roots shall then be pruned by the property owner.

(iv) The tree and vegetation protection fencing shall be clearly shown on the project approval documents. No construction, grading, equipment or material storage, or any other activity shall be allowed within the fenced area. ***All tree and vegetation protection measures shall be inspected and approved by the city arborist prior to the start of any land disturbing activities.***

Columbia Approved Tree Species

Notable Characteristics

Native to Missouri- N	Climate Adapted- C	Salt Tolerant- S
Parking Area- P	Under Power Lines- U	

Common Name	Scientific Name	Characteristic
SMALL TREES		
Buckeye, Red	<i>Aesculus pavia</i>	N,U
Cherry, Canada Red Select	<i>Prunus virginiana</i> 'Shubert Select'	U
Dogwood, Flowering	<i>Cornus florida</i>	N,U
Dogwood, Kousa	<i>Cornus kousa</i>	C,U
Fringe Tree, Chinese	<i>Chionanthus retusus</i>	U
Hoptree	<i>Ptelea trifoliata</i>	C,U
Maple, Japanese	<i>Acer palmatum</i>	U
Maple, Paperbark	<i>Acer griseum</i>	U
Pawpaw	<i>Asimina triloba</i>	N,U
Redbud, Appalachian Red	<i>Cercis canadensis</i> 'Appalachian Red'	U
Redbud, Forest Pansy	<i>Cercis canadensis</i> 'Forest Pansy'	U
Redbud, Oklahoma	<i>Cercis reniformis</i> 'Oklahoma'	U
Rusty Black Haw	<i>Viburnum rufidulum</i>	N,U
Serviceberry	<i>Amelanchier arborea</i>	N,S,U
Smoke Tree	<i>Cotinus obovatus</i>	N,U
Tree Lilac, Japanese	<i>Syringa reticulata</i> 'Ivory Silk'	S,U
Viburnum, Blackhaw	<i>Viburnum prunifolium</i>	N,U
MEDIUM TREES		
Buckeye, Yellow	<i>Aesculus flava</i>	
Cherry, Yoshino	<i>Prunus yedoensis</i>	
Elm, Lacebark	<i>Ulmus parvifolia</i> 'Emerald Prairie'	P
Honeylocust, Imperial	<i>Gleditsia triacanthos</i> 'Impcole'	P,S,C
Honeylocust, Sunburst	<i>Gleditsia triacanthos</i> 'Suncole'	P,S,C
Maple, Hedge	<i>Acer campestre</i>	

Maple, Pacific Sunset	<i>Acer truncatum x platanoides</i> 'Warenred'	C
Maple, Redpointe	<i>Acer rubrum</i> 'Frank Jr.'	
Maple, Shantung	<i>Acer truncatum</i>	C
Maple, Trident	<i>Acer buergerianum</i>	
Persian Parrotia	<i>Parrotia persica</i>	
Red Horse Chestnut	<i>Aesculus x carnea</i>	S
Serviceberry, Spring Flurry	<i>Amelanchier laevis</i>	
Tree Lilac, Chinese	<i>Syringa pekinensis</i> 'China Snow'	
Tupelo, Black	<i>Nyssa sylvatica</i>	N,S
Tupelo, Forum	<i>Nyssa sylvatica</i> 'Forum'	
Tupelo, Red Rage	<i>Nyssa sylvatica</i> 'Red Rage'	
Yellowwood	<i>Cladrastis kentukea</i>	N
Zelkova, Wireless	<i>Zelkova serrata</i> 'Schmidtlow'	
LARGE TREES		
Cypress, Bald	<i>Taxodium distichum</i>	N,S
Cypress, Pond	<i>Taxodium ascendens</i>	
Elm, Accolade	<i>Ulmus x Morton</i>	
Elm, Allee Lacebark	<i>Ulmus parvifolia</i> 'Allee'	
Elm, Emerald Sunshine	<i>Ulmus prop.</i> 'JFS Bieberich' Elm	
Elm, Frontier	<i>Ulmus x 'Frontier'</i>	
Elm, Valley Forge American	<i>Ulmus americana</i> 'Valley Forge'	C
Ginkgo, Princeton Sentry	<i>Ginkgo biloba</i> 'Princeton Sentry'	S
Hardy Rubber Tree	<i>Eucommia ulmoides</i>	C
Kentucky Coffeetree	<i>Gymnocladus dioicus</i>	N,S,C
Maple, Autumn Fantasy	<i>Acer freemanii</i> 'Autumn Fantasy'	
Maple, Fall Fiesta	<i>Acer accharum</i> 'Fall Fiesta'	
Maple, State Street miyabei	<i>Acer miyabei</i> 'State Street'	
Oak, Bur	<i>Quercus macrocarpa</i>	N,P,S
Oak, Chinkapin	<i>Quercus muehlenbergii</i>	N
Oak, Red	<i>Quercus rubra</i>	N,S,C
Oak, Scarlet	<i>Quercus coccinea</i>	N,S,C
Oak, Swamp White	<i>Quercus bicolor</i>	N,S,C

Oak, White	<i>Quercus alba</i>	N,S,C
Planetree, Bloodgood	<i>Plantanus x acerifolia</i> 'Bloodgood'	C
Tulip Tree	<i>Liriodendron tulipifera</i>	N
Zelkova, Village Green	<i>Zelkova serrata</i> 'Village Green'	P
Zelkova, Green Vase	<i>Zelkova serrata</i> 'Green Vase'	P
STREET TREES (Medium)		
Elm, Allee Lacebark	<i>Ulmus parvifolia</i> 'Allee'	
Maple, Hedge	<i>Acer campestre</i>	
Maple, Shantung	<i>Acer truncatum</i>	C
Maple, Trident	<i>Acer buergerianum</i>	
Persian Parrotia	<i>Parrotia persica</i>	
Tree Lilac, Chinese	<i>Syringa pekinensis</i> 'China Snow'	
Tupelo, Black	<i>Nyssa sylvatica</i>	N,S
Tupelo, Black	<i>Nyssa sylvatica</i> 'Forum'	
Tupelo, Black	<i>Nyssa sylvatica</i> 'Red Rage'	
Zelkova, Wireless	<i>Zelkova serrata</i> 'Schmidtlow'	
STREET TREES (Large)		
Cypress, Bald	<i>Taxodium distichum</i>	N,S
Cypress, Pond	<i>Taxodium ascendens</i>	
Elm, Accolade	<i>Ulmus x Morton</i>	
Elm, Emerald Sunshine	<i>Ulmus prop.</i> 'JFS Bieberich'	
Ginkgo, Princeton Sentry	<i>Ginkgo biloba</i> 'Princeton Sentry'	S
Hardy Rubber Tree	<i>Eucommia ulmoides</i>	C
Maple, State Street miyabei	<i>Acer miyabei</i> 'State Street'	
Oak, Swamp White	<i>Quercus bicolor</i>	N,S,C
Planetree, Bloodgood	<i>Plantanus x acerifolia</i> 'Bloodgood'	C
Zelkova, Village Green	<i>Zelkova serrata</i> 'Village Green'	
Zelkova, Green Vase	<i>Zelkova serrata</i> 'Green Vase'	
COLUMNAR TREES		
Hornbeam, European	<i>Carpinus betulus</i> 'Frans Fontaine' or 'Fastigiata'	

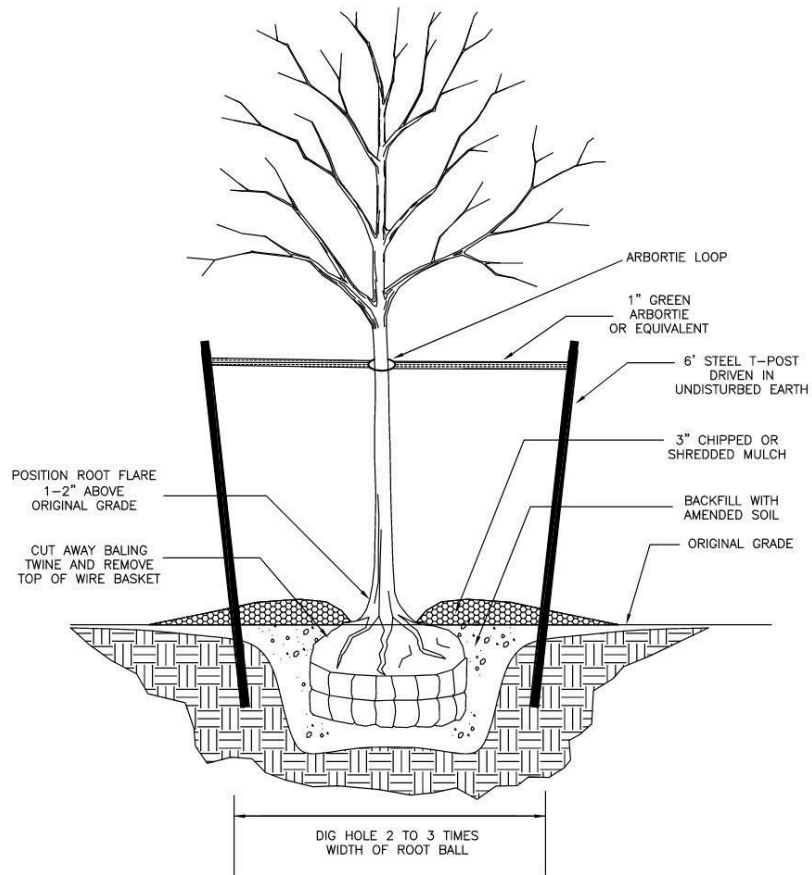
Maple, Armstrong Freeman's	<i>Acer x freemanii</i> 'Armstrong'	
Maple, Bowhall	<i>Acer rubrum</i> 'Bowhall'	
Maple, Green Column Black	<i>Acer nigrum</i> 'Greencolumn'	
Oak, Crimson Spire	<i>Quercus alba x robur</i> 'Crimschmidt'	
Oak, Green Pillar Pin	<i>Quercus palustris</i> 'Pringreen'	
Oak, Regal Prince	<i>Quercus x warei</i> 'Long'	
Zelkova, Columnar	<i>Zelkova serrata</i> 'Musashino'	
CONIFERS		
Spruce, Norway	<i>Picea abies</i>	
Pine, Loblolly	<i>Pinus taeda</i>	
Pine, Shortleaf	<i>Pinus echinata</i>	N
Cedar, Eastern Red	<i>Juniperus virginiana</i>	N,C
Cedar, Japanese	<i>Cryptomeria japonica</i>	
Spruce, White	<i>Picea glauca</i>	
City of Columbia Tree Board		
Approved xx/xx/2024		

Prohibited Plants

Invasive species, as identified by the Missouri Invasive Plant Task Force or Missouri Department of Conservation's invasive species list, are prohibited. The use of plastic or other artificial plant materials is prohibited.

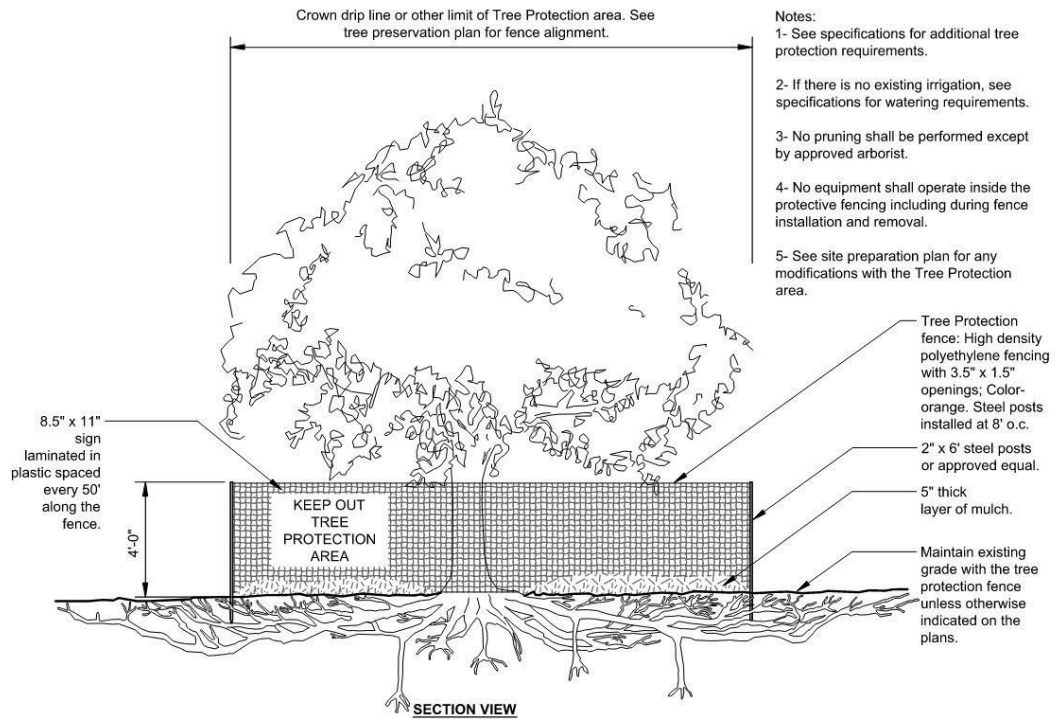
Plan Details and Specifications

Tree Planting



- 1) AMENDED SOIL COMPOSITION — 50% TOPSOIL, 25% COMPOST, 25% SAND.
- 2) ROOT FLARE OF PLANTED TREE MUST BE VISIBLE AND ABOVE ORIGINAL GRADE.
- 3) PLACE 3" OF MULCH ON AND AROUND ROOT BALL. MULCH MUST NOT BE IN CONTACT WITH TREE TRUNK. MAINTAIN 2" CLEAR ZONE TO TRUNK.
- 4) REMOVE TWINE AND FOLD BACK TOP OF BURLAP TO MAINTAIN 2" CLEAR ZONE AROUND TRUNK.
- 5) CUT & REMOVE OR BEND BACK WIRE CAGE FROM TOP HALF OF ROOT BALL.

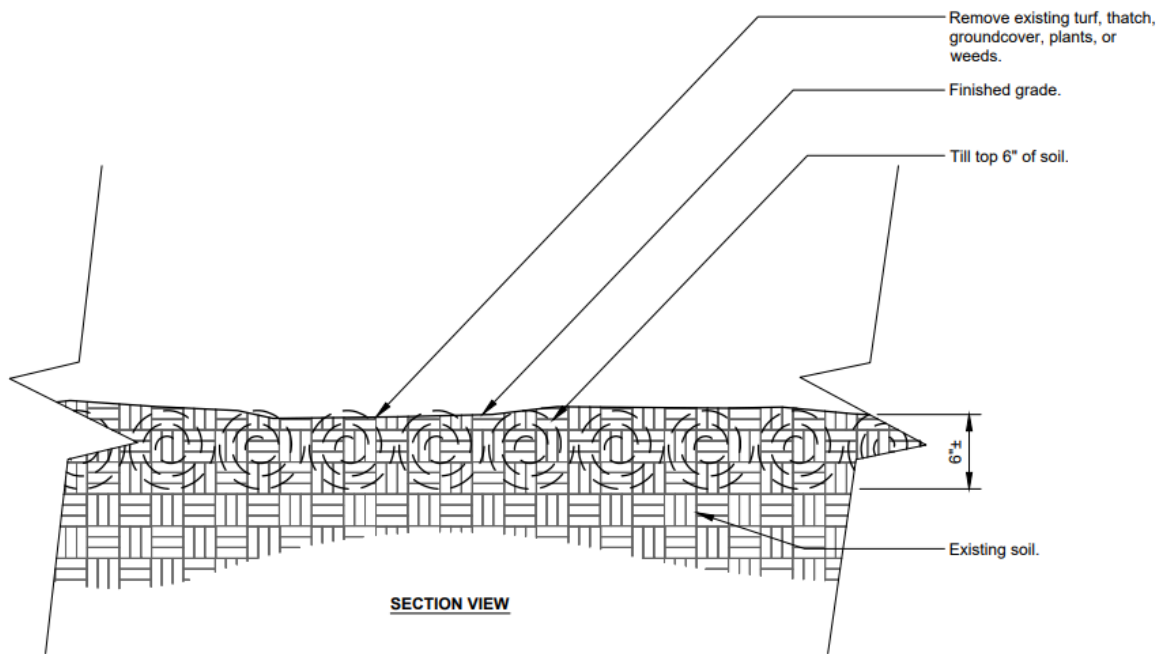
Tree Protection



TREE PROTECTION

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Amendments to the Soil



Notes:
1- See planting soil specifications for additional requirements.



EXISTING SOIL - MINOR MODIFICATION

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Add Spec

Definitions

For the purposes of this document, the following words and phrases shall have the meaning given herein.

Clear cutting- The practice of removing over half of the standing climax forest area on a site.

Climate-adapted plant- A tree or plant species capable of adapting to projected future climate changes. Plants should exhibit tolerance to one or more of the following factors: increased temperature, prolonged periods of drought and drier soil conditions, more intense weather events, and increased insect and disease pressure.

Climax forest- Any woodland community of over twenty thousand (20,000) square feet which is dominated by* climax species such as oak, hickory, sugar maple or bottomland hardwoods such as river birch, basswood, sycamore and hornbeam and which includes an area of five thousand (5,000) square feet with a maximum aspect ratio of 4:1. * "dominated by" is defined as greater than 50% climax species

Conservation- The protection of valuable resources, including but not limited to plants and animals, natural areas, and interesting and important structures and buildings, from the damaging effects of human activity

DBH or dbh (diameter breast height)- Trunk diameter at 4.5 feet about ground.

Developed land- Real estate altered by the addition of impervious surface which changes the hydrology of the property from its natural state.

Developer- A person whose intent or function is to bring about any change of land use or improvement on any parcel of land.

Development- Any change of land use or improvement on any parcel of land.

Director- The Director of the Community Development Department for Columbia, Missouri, or the director's designee, unless the context clearly indicates that another individual is intended.

Director of public works- The Director of the Department of Public Works for Columbia, Missouri or the director's designee.

Easement- Authorization by a property owner for the use by another party, for a specified purpose, of any designated part of that property. It shall include but not necessarily be limited to property designated for installation of storm sewers or drainage ditches, or along a natural watercourse, preservation of the channel to provide for flow of water, or installation of streets, sidewalks, sewer, water, gas, electric transmission lines, telephone, wireline-based communication services facilities, regardless of the technology utilized or other utility services necessary or advantageous to properly serve the public.

Forest land- Forested land area with the aerial canopy dominated by trees greater than four (4) inches in diameter, measured four and one-half (4 1/2) feet above the ground.

Forest parcel- An envelope of trees delineated by the boundaries of grading limits or land disturbances.

Frontage- The length of the property line of any parcel along each street that it borders.

Greenspace conservation easement- A perpetual interest in land described and dedicated on a subdivision plat. By designation of a greenspace conservation easement, no right of entry is automatically given to the city or the public; however, public access may be allowed as defined on the subdivision plat. The use of area contained within a greenspace conservation easement shall be restricted as follows:

(1) No private development of the property shall occur, except for public or private street, driveway, bridge, trails, walkways and utility crossings, where needed. (2) No commercial signs or other advertising material shall be placed within the easement area. (3) There shall be no removal of trees, shrubs or other vegetation on the property except for the performance of acceptable timber stand improvement practices such as selective thinning. Mowing and cutting or removal of brush or trees may continue as necessary to comply with health ordinances, maintain stream beds, banks, existing agricultural, scenic or recreational uses, or eliminate poisonous or noxious plant material. (4) Except as otherwise specifically and expressly authorized on the plat, there shall be no use of the property except for public or private street, driveway, bridge, trails, walkways and utility construction, private noncommercial agricultural, or private noncommercial recreational uses which do not interfere with the growth of the trees and shrubs located on the easement. Uses and activities which are not allowed in district FP-O (floodplain overlay district) shall be prohibited.

Nothing in this definition shall be construed to prevent the city from acquiring other easements in property encumbered with a greenspace conservation easement.

Greenspace trail easement- A perpetual interest in land as described and dedicated by subdivision plat. Designation of a greenspace trail easement shall give the following rights:

(1)Constructing or maintaining a permanent hiking or bicycle trail or path with accessory facilities or accommodation.(2)The right of entry of the city to maintain and develop hiking or bicycle trails or paths.(3)The right of entry of the public for pedestrian or bicycle use of the trails or paths which have been constructed within the easement. No right of entry for motor vehicles is granted to the public except for authorized emergency vehicles.(4)The right to construct public street, bridge and utility crossings as needed.

Nothing in this definition shall be construed to prevent the city from acquiring other easements in property encumbered with a greenspace trail easement.

Impervious surface- A surface on real property where infiltration of stormwater into the earth has been virtually eliminated by the works of man. Impervious surfaces shall include, but not be limited to: Roofs, paved driveways, patio areas, sidewalks, parking lots, storage areas, and other oil or macadam surfaced areas which prevent percolation of storm waters into the earth's surface.

Invasive species- An aggressive, non-native species whose presence causes or is likely to cause economic harm, environmental harm, or harm to human health.

Land disturbance- Any activity, including mechanized clearing, which removes the vegetative ground cover.

Land disturbance permit- A permit issued by the City of Columbia that authorizes the commencement of land disturbance activities or logging.

Landscape material- All trees, woody and flowering shrubs, perennials, and annuals.

Landscaping- The improvement of a lot, parcel, or tract of land with a combination of at least four (4) of the plant categories found in the planting requirements of the city's guidelines for landscaping and screening as promulgated by the director.

Logging- The removal of more than three (3) existing trees for commercial purposes on any tract of land larger than one (1) acre.

Maximum aspect ratio of 4:1- A means of defining the configuration of an area of trees such that the measurement of length of the area shall not be more than four (4) times as long as the measurement of width of the area.

Mechanized clearing- Clearing of land by tracked or wheeled vehicles which scrape, cultivate or scarify the surface of the ground exposing bare soil and uprooting Vegetation.

Nonresidential use- The use of developed land for any purpose other than for a single-family residence or a multiple-family building.

Occupant- The person in possession or lawfully entitled to possession of a parcel of land.

Owner- Any person having legal title to, or a proprietary interest in real property. Proprietary interest shall include, but not be limited to, estate administration, trusteeship, guardianship, and actions under a valid power of attorney.

Pervious surface- A surface on real property where infiltration of stormwater into the earth is not impeded by the works of man. Pervious surfaces shall include, but not be limited to: Grass, mulch and ground cover.

Site- The total area of the parcel, tract, lot or ownership of land upon which development or land disturbance is proposed irrespective of the actual limits or size of the proposed development or land disturbance activity.

Stream buffer- A vegetated area including trees, shrubs, managed lawn areas, and herbaceous vegetation which exists or is established to protect a stream system, lake or reservoir.

Tree, existing- A tree which meets or exceeds the following size standards: Deciduous shade trees shall have a four (4) inch diameter, measured four and one-half (4 1/2) feet above the ground and ornamental and evergreen species shall be a minimum of six (6) feet in height.

Tree or landscaping service- The business activities and equipment storage requirements associated with landscaping design, installation, and maintenance services, including landscape design and contractor offices, landscaping materials stores, and related tool and equipment rentals.

Tree preservation easement- An irrevocable easement, in a form approved by the city counselor, which encompasses all or a portion, when permitted, of the required climax forest that must be saved on a site.

Tree, Significant- A tree that is not diseased, dying, or of a noxious invasive species and that is at least twenty (20) inches diameter at breast height (DBH) for a deciduous tree that is located outside of the tree preservation and stream buffer or utility easement.

Unimproved land- Land or property having little or no "impervious surface."