

Charlotte Tree Manual (CTM)



Version 1.1

August 18, 2023

The Charlotte Tree Manual (CTM) is also known as Section 4.1 of the UDO Zoning Administration Manual

The City of Charlotte has a robust and diverse tree canopy that provides significant environmental, economic, and social benefits to Charlotte residents. Tree canopy is also an integral part of Charlotte's identity and character. Charlotte is known as "The City of Trees" largely due to the historically important value residents and leaders have placed on a healthy tree canopy, and the wise decisions and investments made to sustain this important natural resource.

The purpose of the Charlotte Tree Manual (CTM) is to: 1) support and clarify use of tree preservation regulations and requirements found in the City of Charlotte Tree Ordinance and Article 20. Landscape, Screening, & Tree Preservation of the Unified Development Ordinance (UDO); 2) provide general support and guidance on urban forestry best practices; and 3) increase overall awareness and understanding on tree canopy issues in Charlotte.

The guidelines and illustrations included within this manual are intended to help development professionals and property owners better understand tree preservation regulations and requirements.

The CTM is incorporated into the UDO Zoning Administration Manual (section 4.1)

Additional resources:

Regulatory

- [UDO - Article 20. Landscape, Screening, & Tree Preservation: 20.13 – 20.18](#)
- [Charlotte Tree Ordinance \(Chapter 21 Charlotte Code of Ordinances – May 15, 2023\)](#)
- [Charlotte Land Development Standards Manual \(CLDSM\) – 4000 series – tree standards](#)
 - o [CLDS Approved Species List](#) – page 19
- [Charlotte Landscape Construction Standards](#)
- American Standards of Nursery Stock (ANSI Z60.1)
- [USDA-NRCS Plants Database](#) – native North Carolina tree species
- [UDO Zoning Administration Manual](#)

Policy

- [Charlotte Urban Forest Master Plan](#)
- [Charlotte Future 2040 Comprehensive Plan](#)
- [Tree Canopy Action Plan \(TCAP\)](#)
- Charlotte Tree Canopy Goal – 50% Canopy by 2050

Programs

- Tree Canopy Preservation Program (TCPP)
 - o TCPP Manual
- [Tree by Tree](#)

Tree Care & Preservation Awareness

- [Tree Resources & Education](#)
- [Storm Response & Tree Emergencies](#)



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Heritage Tree Preservation

UDO – Article 20. Landscape, Screening, & Tree Preservation: 20.14
Charlotte Tree Ordinance: 21-8 (g)



****Removal of ANY heritage tree without a removal permit or City-approved land development plan is prohibited. Except in cases of declining health or hazard reasons (see below)****

General

1. Definition - Trees native to North Carolina per the USDA-NRCS Plants [Database](#) with a DBH \geq 30 inches. DBH (diameter) is measured on tree trunk at 4 ½ feet above the ground. See native North Carolina Tree List guideline in this manual for additional guidance.
 - a. Native tree species exempt from heritage tree status:
 - i. All ash species (*Fraxinus* spp.)
2. City limits - protected at all times on all public and private property (parcels) in city limits, regardless of development status. City trees and trees in alleyways are not heritage trees.
3. Charlotte's extraterritorial jurisdiction (ETJ) - preservation requirements ONLY apply at time of land development permitting, on all public and private property (parcels).
4. Types of heritage trees
 - a. Common heritage trees (CHT)– trees NOT been preserved specifically for a development requirement are *common heritage trees*. Only applies in City limits.
 - b. UDO heritage trees (UHT)- trees have been preserved for a development requirement specified in the Unified Development Ordinance (UDO), a Conditional Zoning District, or Neighborhood Conservation District are considered *UDO heritage trees*.

Heritage Trees – Removal Permits & Prohibited Tree Disturbing Activity (TDA)

1. Permit types - Visit the [CLT Development Center](#) website for more information on permits.
 - a. **Non-development customers** – prior to removing a heritage tree customers must obtain a [Non-Development Heritage Tree Permit](#).
 - b. **Development customers** – new projects that trigger or sites that have previous triggered [UDO development applicability](#) are required to submit plans via the [City's land development permitting processes](#).
2. What type of TDA is prohibited and when? – certain types of TDA are prohibited and/or regulated related to heritage trees depending on:
 - a. the type of heritage tree (CHT vs. UHT); and
 - b. whether a scenario is non-development or development-related.

The following activities are considered TDA:

Spray, fertilize, remove, destroy, cut, top, damage, trim, prune, or carve or otherwise severely prune any tree or its root system.

Attach any object, including, but not limited to, rope, wire, nail, chain, or sign, to any such tree or shrub.

Alter the natural drainage, excavate, or lay any drive within the critical root zone.

Perform excavation or construction work, which shall include but not be limited to driveway installations, irrigation work, tree removal and/or grading of any kind, within the drip line of any tree without first installing a fence, frame, or box in a manner and of a type and size satisfactory to the City to protect the tree during excavation or construction work.

c. Prohibited TDA

i. All heritage trees

1. **Removal without a permit or approved land development plan**
 - a. except for declining health or hazard reasons
2. **Topping is prohibited in all cases** and is considered an ordinance violation

ii. Non-development - common heritage trees (CHT)

1. Removal permit required in all cases, unless authorized for declining health or hazard reasons per section 21-8 (g) of the Charlotte Tree Ordinance and this guideline.
2. TDA Restrictions – only removal and topping is prohibited. Other types of TDA don't require a tree work permit (TWP).

iii. Development/post development - UDO heritage trees (UHT)

1. Removal due to allowable conflict/restriction via a City-approved land development plan is required except for declining health and hazard reasons.
 - a. Allowable conflicts/restrictions qualifying for removal:
 - i. required streets, pools, accessory dwelling unit, driveway, building addition, retaining wall, shed with foundation, sidewalk/walkway, patio, utility installations, proper access severely restricted, utility service severely restricted, reduction in capacity to maintain property/improvements, public infrastructure.
 - ii. Conflicts and/or restrictions MUST impact heritage tree critical root zone, trunk, and canopy collectively beyond a preservable condition to qualify for removal.
 - b. Items typically NOT qualifying for removal:
 - i. fence, shed without foundation, garden, gazebo without foundation, playground equipment
2. TDA Restrictions
 - a. TDA that DOES require a permit:
 - i. tree removal, installation of any structures and/or improvements, grade changes > 4 inches, digging, trenching, and any excavation impacting CRZ
 - ii. general tree canopy maintenance work including crown cleaning; crown balancing; cabling/bracing; reduction of limbs; removing dead, damaged and broken limbs; deep root fertilization, root pruning.
 - iii. General tree canopy maintenance shall be completed under the supervision one of the following: an ISA-certified arborist, a NC Licensed Landscape Contractor, or a City of Trees – Canopy Care Certified contractor (*certification program in development*).

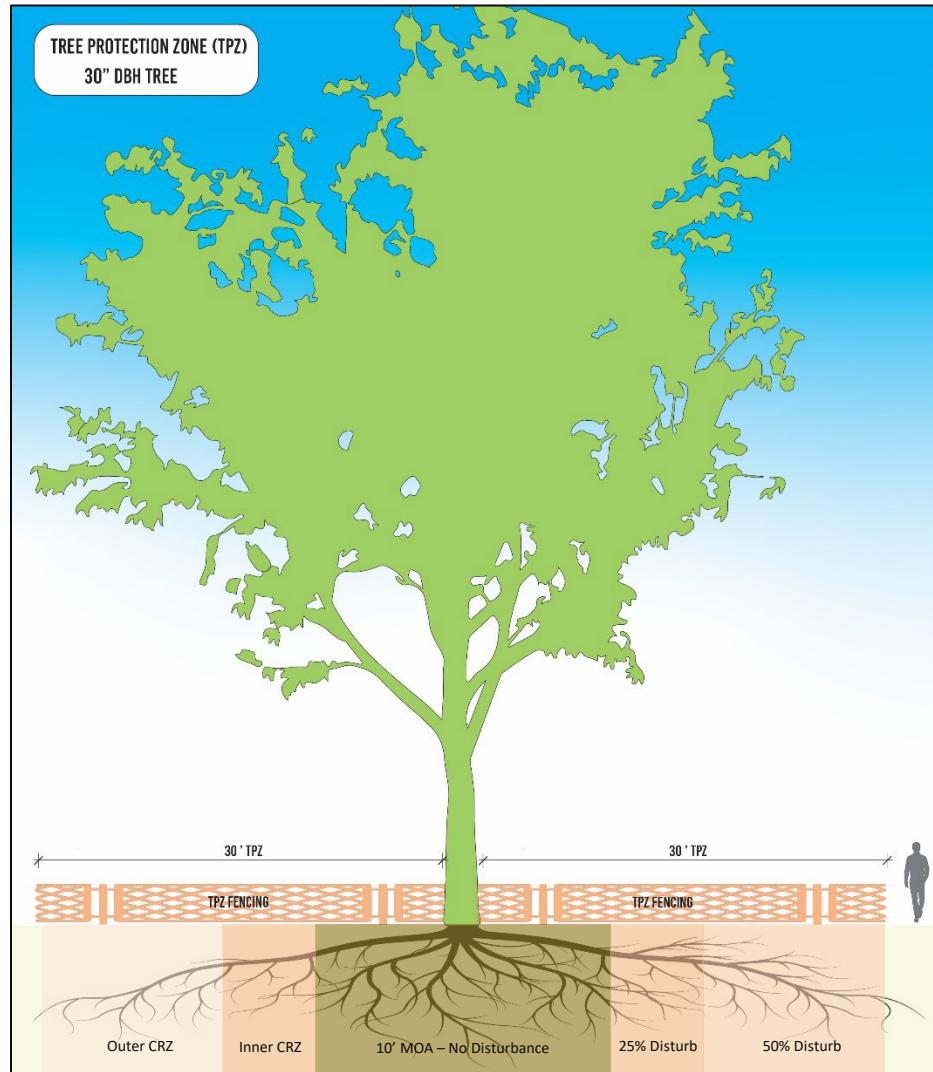
- b. **Critical Root Zone (CRZ) Protection** – CRZ shall equal one (1) linear foot of protection for each inch of tree trunk diameter (DBH).

Maximum CRZ disturbance:

Minimum offset area (MOA) – area directly adjacent to root flare where no TDA is permitted. Minimum 10' for all heritage trees. May be adjusted on a case-by-case basis based on tree characteristics and/or existing site conditions or constraints. Trees greater than 30" DBH may require greater MOA.

Inner CRZ – zone directly adjacent to root flare equaling half of tree's dbh in linear feet, overlaps with MOA to some degree, up to 25% of total area may be disturbed.

Outer CRZ – zone outside of Inner CRZ equaling half of trees dbh in linear feet, Up to 50% of area may be disturbed.



3. Declining health or hazard guidance – no permit required

Urban Forestry strongly recommends customers seeking to remove heritage trees using the “declining health” justification submit applications prior to tree removal work. Urban Forestry will conduct a gateway review to determine if removal work qualifies for declining health justification. Applications qualifying for declining health justification won't be charged a permit fee, require a permit, or require mitigation.

a. Declining health justification – requires:

- i. Submittal of the following documentation before or within 3 days of tree removal
 1. Current ISA Tree Risk Assessment Form completed by an ISA-certified & TRAQ-qualified arborist.
 2. Additional data as needed to support assessment results such as pictures, report, analysis results, etc.
- ii. To qualify for declining health justification assessments must specify:
 1. entire tree failure may occur within a timeframe of 1-3 years with a risk rating of High or Extreme per Form's Matrix 2. Risk Rating Matrix.

Matrix 2. Risk rating matrix.

Likelihood of Failure & Impact	Consequences of Failure			
	Negligible	Minor	Significant	Severe
Very likely	Low	Moderate	High	Extreme
Likely	Low	Moderate	High	High
Somewhat likely	Low	Low	Moderate	Moderate
Unlikely	Low	Low	Low	Low

- b. Hazardous tree justification – likelihood of failure is imminent, meaning failure started or is most likely to occur in the near future (minutes, days, or < 2 weeks). Trees that require immediate action to protect people and property from harm.
- i. Trees may be removed immediately without a permit, however, minimum documentation shall be provided within 3 days of removal and shall include an assessment from an ISA-certified arborist or a combination of picture, video, and witness statement evidence.
- c. Documentation - for removal of trees for hazardous tree or declining health justification must be provided to the City by property owners and/or contractors performing the removal work. Failure to provide removal documentation within 3 days of tree removal may subject property owner and other persons to permit fees, mitigation requirements, civil penalties and fines.

Mitigation

Mitigation Tree Planting

1. A minimum of one mitigation tree shall be planted on-site.
2. Mitigation trees are code-required trees and must be replanted in the future if dead/missing. Mitigation trees are in addition to other required trees and do NOT count toward meeting other requirements.
3. Mitigation trees shall be native large mature species if no overhead powerline conflict exists, unless otherwise approved by the Chief Urban Forester or their designee.
4. Mitigation trees shall be a minimum of two-inch caliper and have a minimum height of eight feet, multi-stem trees shall have a minimum of three to five stems if applicable, unless otherwise approved by the Chief Urban Forester.
5. Mitigation trees shall have a minimum of 274 square feet of planting area, unless otherwise approved by the Chief Urban Forester. Amended soil may be required for mitigation tree planting.
6. Mitigation trees planted in locations of previous heritage trees may be located less than ten feet from buildings and underground utilities and may have less than 274 square feet of planting area. Trees planted in other locations must maintain ten-foot separation unless otherwise approved by the Chief Urban Forester.

Mitigation Payment

1. Development scenarios - \$1,500 per heritage tree removed
2. Non-land development scenarios - \$500 per heritage tree removed
3. Mitigation payments may be reduced by \$250 per tree for each additional mitigation tree planted beyond the minimum requirement

Specimen Tree Mitigation

1. Specimen trees preserved for heritage tree mitigation shall be credited at a 1:1 ratio, only large mature trees may count for specimen tree mitigation

Tree Survey Guidance

1. Conditional Zoning Map Amendments – all heritage trees on-site shall be identified and depicted (no CRZ required). In all cases center point location, trunk diameter at DBH, and species must be noted.
2. Land Development Permitting – The following heritage information shall be depicted on all land development plans submitted to the City:
 - a. All heritage trees within 50' of land disturbing activity on a site
 - b. All heritage trees selected to meet development requirements or green area incentives
 - c. All specimen trees used for heritage tree mitigation
 - d. In all cases center point location, trunk diameter at DBH, and species must be depicted and noted
 - e. CRZ of all preserved heritage trees and/or specimen trees that will be impacted by TDA
 - f. Graphic representation
 - i. All heritage trees shall be represented by a circle or point
 - ii. Trees proposed to be removed shall be displayed with an X overlaid on circle or point
 - iii. CRZ - Inner CRZ, Outer CRZ, and Minimal off-set area shall be depicted when required. All portions of these zones/areas that will be impacted by TDA shall be hashed differently from undisturbed CRZ zones/areas.

Green Area Guideline



UDO – Article 20. Landscape, Screening, & Tree Preservation: 20.15
Charlotte Tree Ordinance: 21-8

****Applicability** - All development (including additions to existing sites) occurring on/or after June 1st, 2023, subject to UDO Article 20 -15 shall meet green area requirements. No exemptions are allowed.**

General Tree Save Standards

Invasive plant species – see the North Carolina Invasive Plant Council's [list of invasive species](#) found in the Piedmont. Invasive plant species are considered removed if they are no longer living in or under the tree canopy. Vine species at minimum must be cut at the base of trunks. Trees, shrubs, and herbaceous species must be eradicated completely from tree save areas or managed to allow all phases of forest succession to occur unimpeded.

Alterations to tree save – all alterations to tree save must obtain a tree work permit from Urban Forestry. All authorized work in tree save areas may be required to implement critical root zone and/or trunk protection.

Tier 3 & 4 Place Types – no mechanized or vehicular equipment including but not limited to: chainsaws, pole saws, trenching equipment, skid steers, and excavation equipment are allowed to access, maneuver, or operate in tree save areas. Installations must be organic and environmentally friendly materials approved by Urban Forestry (e.g., double-hammered non-dyed mulch). Ground cover in tree save areas must be composed of a natural wood non-dyed mulch or native vegetation.

Tier 1 & 2 Place Types - mechanized or vehicular equipment may be allowed in tree save areas ONLY if authorized by Urban Forestry via a tree work permit.

Minimum dimensions – all on-site and off-site tree save, and land donated to meet green area requirements shall be a minimum of 30' x 30'. Any proposed tree save or donated land less than 30' in width shall be delineated on site with boundary and property lines by a licensed surveyor prior to first plan submittal. Deviation from minimum 30' dimension is not permitted unless otherwise approved by the Chief Urban Forester or their designee due to special conditions including but not limited to: topography, existing on-site canopy fragment size, conflict/constraint with another UDO requirement.

Ten Foot No-build Zone – No structure shall be allowed within ten feet of the tree save area. A building restriction note shall be indicated on the record plat and the ten foot no-build zone shall be depicted on the plat.

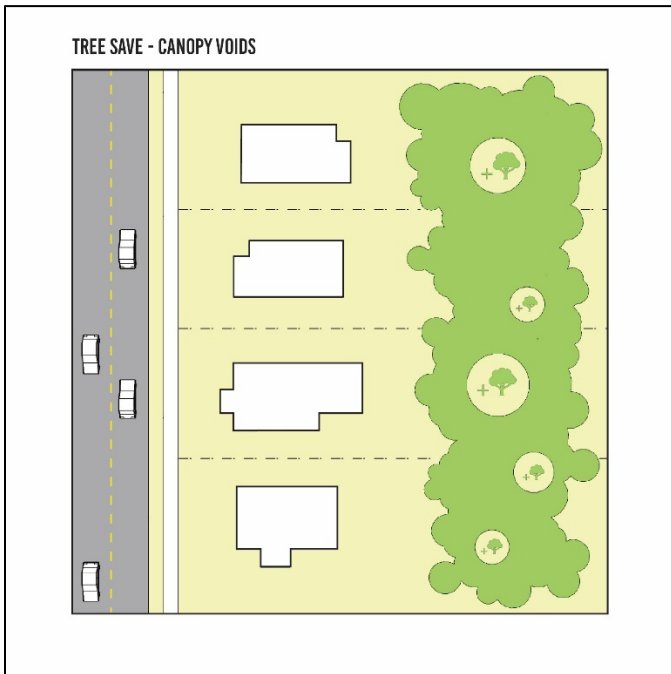
Tier 1 & 2 Place Types – ten foot no-build zones may count toward tree save area as long as the zone directly and continuously abuts a tree save area and remains pervious. No code-required trees are allowed in ten foot no-build zones.

Amenity elements – benches, trails, gazebos, sheds, fences, and other minor amenity elements may be installed in tree save areas on a case-by-case basis and must be authorized by Urban Forestry via a tree work permit or City-approved land development plan.

Tree save overhang & utility easements – sites in Tier 1, 2, and 3 Place Types or nonresidential sites in Tier 4 Place Types may include existing tree canopy which overhangs existing underground utility easements only if existing canopy is provided from healthy and structurally sound trees and the canopy will be preserved during duration of project construction. Only the dripline area overhanging utility easements may be used to meet green area requirements and must be depicted on final plats.

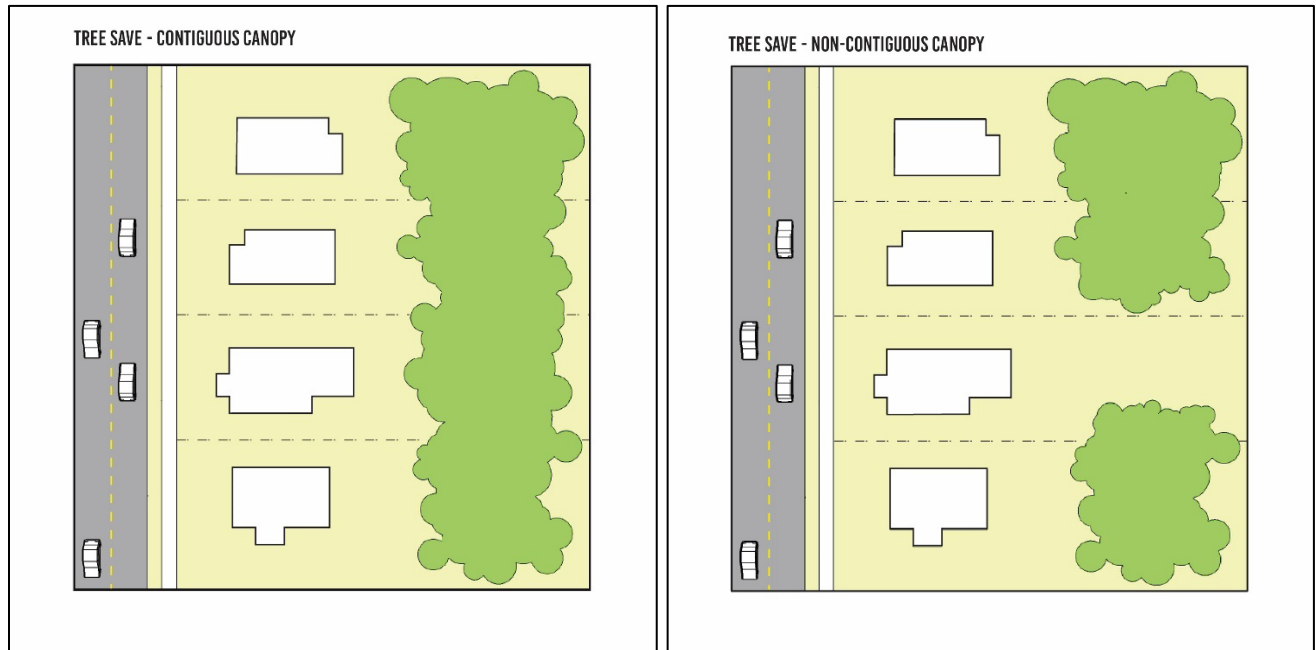
Power distribution lines – small maturing trees planted within 25' of distribution lines in accordance with Duke Energy's approved planting list and area requirements may count toward tree save.

Canopy voids – are considered areas lacking canopy where existing trees are not expected to fill in voids over time as part of natural forest succession. Voids are a maximum of 40' in width.



On-site Tree Save

Contiguous Tree Save - On-site tree canopy shall be preserved in a contiguous manner per the guidelines below.



1. Contiguous Guidelines

- a. Fragments – a contiguous area of existing on-site tree canopy shall be preserved unless one of the following separations occurs, maximum of 3 non-contiguous fragments is allowed, a portion of all fragments must directly abut separation :
 - i. Streams, creeks, rivers
 - ii. Utility easements and r/w
 - iii. Required streets
 - iv. Rail r/w
 - v. Sites with an existing fragmented canopy
 1. Developed and vacant sites that trigger green area applicability and have an existing fragmented on-site tree canopy may use multiple fragments to meet the 15% requirement. Tree save shall be provided in as few fragments as possible.

A minimum of 30' border of all non-contiguous tree save area fragments must directly abut allowable separations.
- b. In combination – On Tier 1 & 2 sites when existing on-site tree canopy will be preserved in combination with other green area options available per *UDO Table 20-5 Green Area Credits*, preserved tree save area shall be contiguous per items 1.a. – b. above.
- c. Replanted tree save – available when existing on-site tree canopy is < 15%. When allowed does NOT have to be contiguous or adjacent to preserved tree save area. Must be a minimum width of 20'.
- d. Replanted tree save mitigation
 - i. Tier 1 & 2 - available as a standard option.
 - ii. Tier 3 & 4 - only available as a last resort.

1. Removal of existing on-site tree canopy below 15% requirement only authorized if: 1) preservation impacts buildable area of a City-required structure/improvement and no other reasonable location is available; and/or 2) preservation would unreasonably restrict use/access of property.
2. If authorized, a re-planting penalty is applied requiring 150% mitigation tree save area to off-set the percentage of existing on-site tree canopy removed below 15% requirement.
3. Must be a minimum width of 20'.
- e. Heritage and Specimen Trees – may be preserved individually or in groups outside of tree save area fragments and count toward 15% green area requirement.
- f. Adjacent property contiguous tree save incentive – A minimum of 30' of a developing site's tree save boundary must directly abut a neighboring property's tree save to qualify for the incentive. If the neighboring property's tree save is < 30', the developing site's tree save boundary must directly abut the entire tree save boundary of the neighbor property.

Off-site Tree Save

An applicant must convey or protect land to qualify off-site tree save within Charlotte's city limits or ETJ. Off-site tree save is not available as an option for single-family development and cannot be used in combination with payment-in-lieu to meet applicable green area requirements. UDO tables 20-4 and 20-5 should be consulted to determine off-site tree save is available as an option.

Payment-in-Lieu

A payment may be made by a developer or a property owner to a City administered tree preservation fund, per item 1 below. The payment shall be a percentage of the tax value of the land being developed pursuant to the Charlotte Tree Manual. The tax value of the land being developed shall not exceed 90% of the average tax value of land in the City limits and of the ETJ, excluding the land within the boundaries of I-77/I-277 and in accordance with the Charlotte Tree Manual. The City shall update the average tax value of the land for this formula with each County property revaluation. Payment-in-lieu may be used for a portion of the required 15% green area or the entire required green area in accordance with the requirements of this section

1. Collected monies from mitigation and payment-in-lieu processes per this item shall be deposited into the Tree Conservation Fund established in Section 20-18.D.1.a.

How to Calculate Green Area Payment-in-lieu (PIL) Fee

A. PIL formula

a. Developing Site's Acreage X Site's Appraised Land Tax Value¹ X .15 or .30² = (\$) Fee

- i. ¹ If a site's value is greater than 90% of the average value, the site qualifies to use the capped value below
- ii. ² Check Table UDO Table 20-5 Green Area Credits to see which multiplier applies

B. Determine property's acreage and land tax value

- a. Go to [Charlotte Explorer](#), enter relevant Parcel ID and search, click highlighted parcel, check *Parcel Information* and *Assessment Value/Card Info* section in information panel

C. Capped value - 90% of average tax value for one (1) acre of land in Charlotte and it's extraterritorial jurisdiction (ETJ) = **\$192,626**

- a. Derived by analysis of current county property records and [2019 Revaluation](#) results

- D. Multiplier – determine site's place type, consult UDO Table 20-4: Tier Assignment of Place Types to determine applicable tier, consult UDO Table 20-5: Green Area Credits to determine applicable multiplier. Tier 1 = 15% Tier 2 = 30%

Table 20-4: Tier Assignment of Place Types			
Tier 1 Place Types	Tier 2 Place Types	Tier 3 Place Types	Tier 4 Place Types
Regional Activity Center Place Type	Manufacturing and Logistics Place Type	Neighborhood 2 Place Type - All zoning districts other than N2-C Zoning District	Neighborhood 1 Place Type
Community Activity Center Place Type	Neighborhood Activity Center Place Type		
Campus Place Type - If zoned IC-2 or RC Zoning District	Commercial Place Type	Campus Place Type - All zoning districts other than IC-2 or RC Zoning District	Parks and Preserves Place Type
	Innovation Mixed-Use Place Type		
	Neighborhood 2 Place Type - If zoned N2-C Zoning District		

Table 20-5 Green Area Credits				
Green Area Credits	Multipliers			
	Tier 1	Tier 2	Tier 3	Tier 4
Payment-in-Lieu (See Section 20.15.G) ³	1	0.5		

Restrictions

- E. Single-family subdivision development - PIL is not available as an option
 F. Combination - PIL may not be used in combination with off-site tree save

PIL Formula Examples

Example 1

- 1-acre PIL qualifying site with an appraised land tax value of \$175,000 opts to use the payment-in-lieu option to meet the Green Area requirement. Tier 1 Green Area Credit rate of 1 (15%) multiplier applies

$$1.0\text{-acre} \times \$175,000 \text{ land tax value} \times .15 = \$26,500$$

Example 2

- 1-acre PIL qualifying site with an appraised land tax value of \$1,500,000 opts to use the payment-in-lieu option to meet the Green Area requirement. Tier 1 Green Area Credit rate of 1 (15%) multiplier applies

$$1.0\text{-acre} \times \$192,626^* \text{ land tax value} \times .15 = \$28,893.90$$

*site qualifies to use capped value due to appraised land tax value exceeding \$192,626

Example 3

- 1-acre PIL qualifying site with an appraised land tax value of \$1,500,000 opts to use the payment-in-lieu option to meet the Green Area requirement. Tier 2 Green Area Credit rate of 0.5 (30%) multiplier applies

$$1.0\text{-acre} \times \$385,252^* \text{ land tax value} \times .30 = \$115,575.60$$

*site qualifies to use capped value due to appraised land tax value exceeding \$192,626

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Frontage Tree Planting Requirements

UDO – Article 20. Landscape, Screening, & Tree Preservation: 20.16



Applicability

Frontage tree planting requirements apply to development projects constructing a single and new single-family, duplex, triplex, or quadraplex structure (principal structure) on a single property in N1 and N2 zoning districts, except as part of an approval of a new subdivision as defined by UDO section 30.3.A, or as part of a multi-dwelling development, or if constructed on three or more contiguous or adjacent lots. See UDO sections 2.3 General Definitions and 15.3 Use Definitions for clarity on structure and dwelling unit definitions.

Length of frontage will be determined on overall length of property line adjacent to public street right-of-way.

Planting – minimum one tree per lot

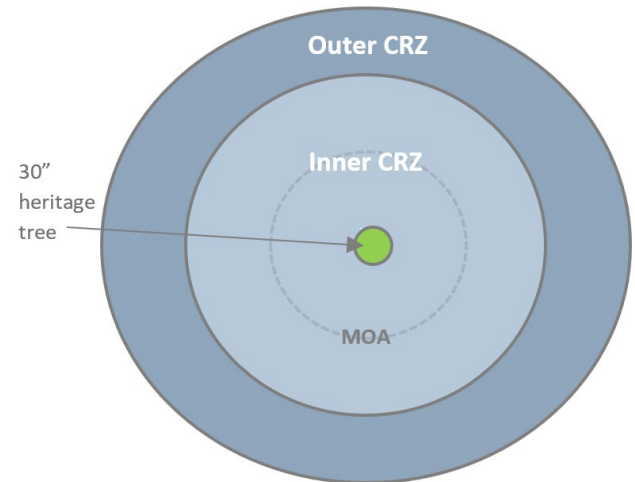
1. Tree type - large mature tree species must be planted on 40' spacing to meet this requirement unless there is a conflict with overhead distribution power lines (no large mature trees allowed within 25'). Service power lines providing electrical services to dwellings are not considered conflicts. Additional items that significantly restrict and reduce root and canopy growth such as insufficient tree spacing, planting strip width, water meters, sewer lines, driveways, stop sign visibility, and sight triangles may allow for the planting of small tree species.
2. Size & Placement – trees must be planted between residential buildings and public streets. Trees may be planted in City-maintained public street right-of-way (not in NCDOT right-of-way).
 - a. Conflicts – Sites with demonstrated constraints including insufficient tree spacing, planting strip width, water meters, sewer lines, driveways, stop sign visibility, and sight triangles may meet this requirement through payment-in-lieu or planting in alternate locations on the site, only if constraints significantly restrict and reduce root and canopy growth.
 - b. Existing trees – only existing large maturing shade trees two-inch caliper or greater may be counted towards this requirement if adequately protected during construction.
 - c. Tree size – trees shall be a minimum of two-inch caliper and meet American Standards of Nursery Stock (ANSI Z60.1), unless otherwise authorized by the Chief Urban Forester or their designee.
 - i. Growth – topping is prohibited. Frontage trees must be allowed to growth to their natural height and form. Any code-required tree that is dead or missing, or that is authorized for removal shall be replaced with a new tree by the property owner during the next planting season (November – March) to maintain continuing compliance with this requirement.
 - ii. Tree Disturbing Activity – trees planted to meet this requirement are considered protected and code-required trees, and require tree work permits from the City prior to tree disturbing activity for maintenance. Topping is prohibited.
 - d. Minimum planting area – trees planted to meet this requirement shall be provided a minimum planting area of 274 square feet. Existing sites with demonstrated constraints may be allowed to provide reduced planting area with approval of Chief Urban Forester or their designee.

Critical Root Zone (CRZ)

UDO – Article 2. Rules of Construction, Abbreviations, & Definitions: 2.3
Charlotte Tree Ordinance: 21-2
CLDS 40.02 Tree Protection Detail

Definition

The area of soil around the tree where roots that provide stability and uptake of water and minerals are located, the main structural and functional part of the root system. It is a protected circular area around a tree with a radius equal to one foot per inch of tree diameter at breast height (DBH) with the tree trunk at the center of the circle.



CRZ Standards

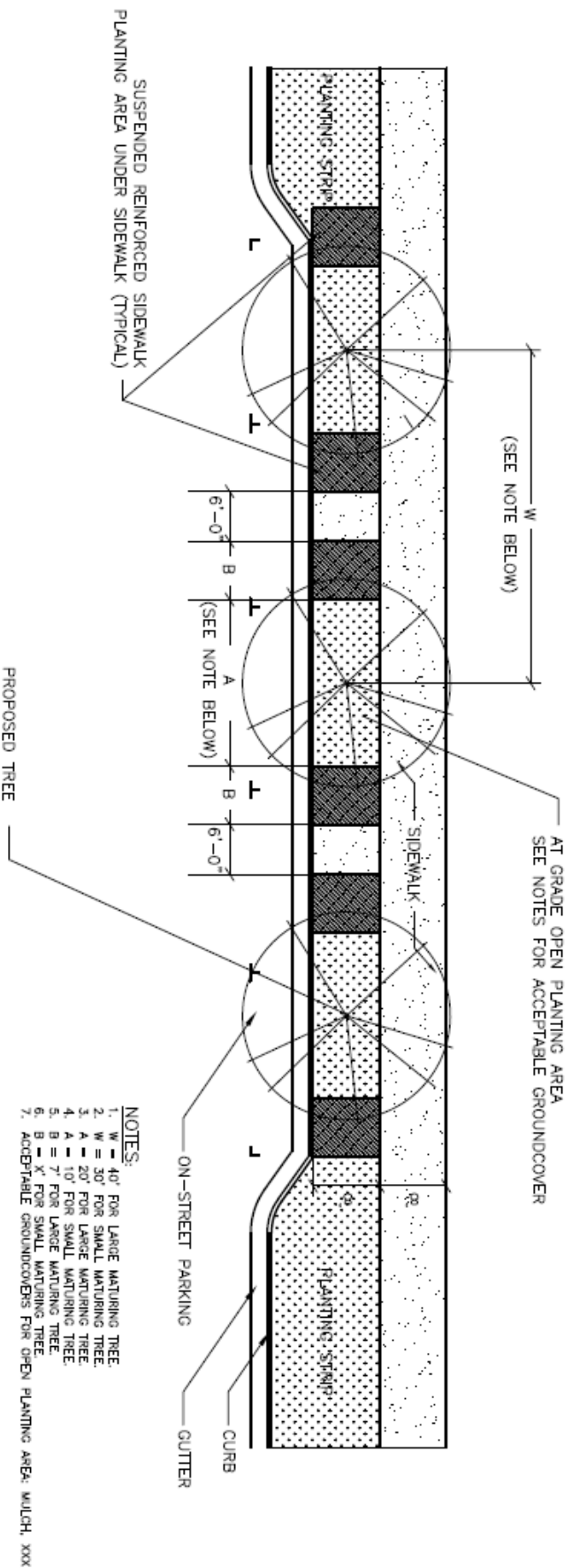
CRZ shall equal one (1) linear foot of protection for each inch of tree trunk diameter (DBH). Trees shall have a minimum CRZ of 6'.

Disturbance terminology in this guideline refers to tree disturbing activity (TDA) as defined in the definitions section of the Charlotte UDO and Tree Ordinance.

CRZ areas

1. Minimum offset – the minimum distance at which tree disturbing activity may occur in proximity to the root flare of a protected tree. TDA within the minimum offset area is prohibited as it may lead to immediate loss of structural integrity and significant decline in tree health.
 - a. For heritage trees MOA shall be a minimum distance of 10'.
2. Inner CRZ – zone directly adjacent to root flare and equal to half of tree's DBH. This area contains vital structural roots critically important to supporting a tree's structural integrity and health. Overlaps with MOA.
3. Outer CRZ – zone adjacent to Inner CRZ area and equal to half of tree's DBH. This area contains important feeder roots important to biological processes supporting tree health, also contains roots important to structural support. Trees can generally tolerate TDA in this area better than within the Inner CRZ area.
4. CRZ adjustments – The Chief Urban Forester or their designee may consider adjustment to CRZ dimensions on a case-by-case basis depending on pre-existing site conditions and specific tree characteristics such as species tolerance to construction activity. Existing site conditions that may be considered include: foundations, utilities, bedrock, and other existing structures.
 - a. Heritage trees - have specific maximum CRZ disturbance limits. See heritage tree guideline in this manual for more information.

DRAFT DETAIL



NOT TO SCALE



Amended Soil Guideline

UDO – Article 20. Landscape, Screening, & Tree Preservation
Charlotte Tree Ordinance
CLDS 40.06, 40.08A, 40.08B, 40.08C

Amended Soil (AS)

The AS requirement may be met in one of the following ways:

1. Preparing the existing soil for planting by tilling to a depth of 18", and adding some new planting mix and/or organic matter. This option may also require the removal of some existing soil along with other mitigation work and soil amendments to improve soil structure.
2. Removing all existing soil from a protected/required planting area and replacing it with new planting mix and other soil amendments.
3. AS requirements may be waived by the Chief Urban Forester, City Arborist, or their designees.

Determination of AS requirements will be made by the Chief Urban Forester, City Arborist, or their designees. Staff will inspect soil at the time of planting to determine required soil amendments.

Planting mix used to meet AS requirements shall have uniform composition throughout, with a mixture of subsoil. It shall be free of stones, lumps, live plants and their roots, sticks, and other extraneous matter. It shall contain no man-made materials unless otherwise specified. Planting mix shall not be used while in a frozen or muddy condition.

Unless otherwise specified in the contract documents, new/added planting mix shall contain the following specified percentages of constituents:

CLAY	Minimum 10%/ Maximum 40%
SAND	Minimum 20%/ Maximum 50%
SILT	Minimum 20%/ Maximum 50%
ORGANIC MATTER	Minimum 5%/ Maximum 10%

Organic Matter is defined as compost/humus such as sawdust or leaf mold that has completed the decomposition process. Percentage of organic matter shall be determined by loss on ignition of moisture free samples dried at 65 degrees.

AS shall have a have an acidity range of pH 5.5 to 7.0.

AS shall have a Cation Exchange Capacity (CEC) from 5 to 25 cmol +/kg(meq/100g).

AS shall have normal contents of nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, and proper micronutrient levels. Nutrient levels must satisfy growing needs (as recommended by lab report) of the existing or planned plant material.

Lab testing may be required to verify the quality of existing soil, AS and other soil amendments



Tree Protection Signage

UDO – Article 20. Landscape, Screening, & Tree Preservation: 20.18 A.2.
Charlotte Tree Ordinance: 21-7
CLDS 40.02 Tree Protection Detail

Tree Protection Sign Standards

Tree protection zone (TPZ) signs, as provided below, are required to be installed on all City-required tree protection fencing. TPZ signs must be clearly visible and legible on all sides of TPZ by the general public and all persons working in close proximity to protected trees and areas. TPZ signs must be installed throughout the life of projects and may not be removed except to replace any existing signs that are insufficient or if authorized by City.

Quality – TPZ signs must be provided and installed with white background and red warning font on the top of the sign.

Minimum dimensions – TPZ signs shall be a minimum of 8.5" x 14" and made from water resistant material.

Attachment – TPZ signs must be attached to fencing and may be attached using zip ties, twine, or another material that will adequately hold signs in place.


Placement – At least one TPZ sign shall be installed on all fence segments surrounding a protected tree or area. One sign shall be installed every 100' on fencing segments greater than or equal to 100' in length, or as otherwise approved by the City.

TPZ sign template available on next page

Sign image below provided for reference purposes only

Tree Protection Zone (TPZ) Do Not Enter

Zona De Protección De Árboles (ZPA) – No Entre



No tree disturbing activity may occur in the TPZ without authorization by the City of Charlotte.

Tree protection fencing must remain in place and cannot be removed without authorization by the City of Charlotte.

Unauthorized tree disturbing activity and failure to maintain tree protection measures may subject persons to civil penalties and fines per Article 20 of the Charlotte Unified Development Ordinance and/or the Charlotte Tree Ordinance (Chapter 21 of city code).

No se permite ninguna actividad que disturba los árboles en la ZPA sin la autorización de la Ciudad de Charlotte.

La cerca de protección de árboles debe permanecer en su lugar y no puede ser removida sin la autorización de la Ciudad de Charlotte.

Actividades no autorizadas que disturban los árboles o la falta de medidas para mantener la protección de árboles pueden someter a las personas a sanciones civiles y multas según el Artículo 20 de la Ordenanza de Desarrollo Unificado de Charlotte y / o la Ordenanza de Árboles de Charlotte (Capítulo 21 del código de la ciudad).

Contact Information – concerns/inquiries may be directed to **CharMeck 311**.

Información de contacto: preguntas se pueden dirigir a **CharMeck 311**.

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Native NC Tree Species List

The native species list helps customers and residents identify heritage trees on their property. The list is intended to support heritage tree requirements of the UDO and Charlotte Tree Ordinance. The native species list is NOT the same as Approved Species List.

The list contains all North Carolina native tree species commonly found in Charlotte, NC in heritage tree size. For a comprehensive list of all native species visit the U.S. Department of Agriculture Natural Resource Conservation Service [Plants Database](#).

Tree identification resources:

- [ID Your Tree](#) - City of Charlotte Landscape Management
- [Identification of Common Trees of North Carolina](#) – NC State Extension
- [Trees of North Carolina](#) – NC State University

Native Tree Species to North Carolina – Common to Charlotte in Heritage Tree Size				
#	Scientific Name	Common Name	Common to Charlotte	Common Heritage Tree
1	Acer floridanum (Chapm.) Pax	southern sugar maple	y	y
2	Acer rubrum L.	red maple	y	y
3	Acer saccharinum L.	silver maple	y	y
4	Acer saccharum Marshall	sugar maple	y	y
5	Carya cordiformis (Wangenh.) K. Koch	bitternut hickory	y	y
6	Carya glabra (Mill.) Sweet	pignut hickory	y	y
7	Carya illinoensis (Wangenh.) K. Koch	pecan	y	y
8	Carya laciniosa (Michx. f.) G. Don	shellbark hickory	y	y
9	Carya ovata (Mill.) K. Koch	shagbark hickory	y	y
10	Carya tomentosa (Lam.) Nutt.	mockernut hickory	y	y
11	Catalpa bignonioides Walter	southern catalpa	y	y
12	Catalpa speciosa (Warder) Warder ex Engelm.	northern catalpa	y	y
13	Celtis laevigata Willd.	sugarberry	y	y
14	Celtis occidentalis L.	common hackberry	y	y
15	Fagus grandifolia Ehrh.	American beech	y	y
16	Fraxinus americana L.	white ash	y	y
17	Fraxinus caroliniana Mill.	Carolina ash	y	y
18	Fraxinus pennsylvanica Marshall	green ash	y	y
19	Juglans nigra L.	black walnut	y	y
20	Liquidambar styraciflua L.	sweetgum	y	y
21	Liriodendron tulipifera L.	tuliptree	y	y
22	Magnolia grandiflora L.	southern magnolia	y	y
23	Nyssa sylvatica Marshall	blackgum	y	y

#	Scientific Name	Common Name	Common to Charlotte	Common Heritage Tree
24	<i>Pinus echinata</i> Mill.	shortleaf pine	y	y
25	<i>Pinus taeda</i> L.	loblolly pine	y	y
26	<i>Platanus occidentalis</i> L.	American sycamore	y	y
27	<i>Populus ×canadensis</i> Moench (pro sp.) [<i>deltoides</i> × <i>nigra</i>]	Carolina poplar	y	y
28	<i>Populus deltoides</i> W. Bartram ex Marshall	eastern cottonwood	y	y
29	<i>Quercus alba</i> L.	white oak	y	y
30	<i>Quercus bicolor</i> Willd.	swamp white oak	y	y
31	<i>Quercus coccinea</i> Münchh.	scarlet oak	y	y
32	<i>Quercus falcata</i> Michx.	southern red oak	y	y
33	<i>Quercus laurifolia</i> Michx.	laurel oak	y	y
34	<i>Quercus lyrata</i> Walter	overcup oak	y	y
35	<i>Quercus montana</i> Willd.	chestnut oak	y	y
36	<i>Quercus nigra</i> L.	water oak	y	y
37	<i>Quercus palustris</i> Münchh.	pin oak	y	y
38	<i>Quercus phellos</i> L.	willow oak	y	y
39	<i>Quercus rubra</i> L.	northern red oak	y	y
40	<i>Quercus shumardii</i> Buckley	Shumard's oak	y	y
41	<i>Quercus stellata</i> Wangenh.	post oak	y	y
42	<i>Quercus velutina</i> Lam.	black oak	y	y
43	<i>Quercus virginiana</i> Mill.	live oak	y	y
44	<i>Taxodium distichum</i> (L.) Rich.	bald cypress	y	y
45	<i>Tilia americana</i> L.	American basswood	y	y
46	<i>Ulmus alata</i> Michx.	winged elm	y	y
47	<i>Ulmus americana</i> L.	American elm	y	y
48	<i>Ulmus rubra</i> Muhl.	slippery elm	y	y

City of Charlotte Tree Management/Maintenance Areas

Landscape Management maintains trees planted within the rights-of-way on all City maintained public roads and NCDOT maintained roads within the City's corporate limits; exceptions include all private streets and roads identified in red on below map.

Road segments identified in red in include: all interstate roads (I-77, I-277, I-85, I-485); Billy Graham Parkway; Brookshire Freeway from I-277 to Centre St; Independence Boulevard from I-277 to Briar Creek Road; Albemarle Road from Independence Boulevard to Pierson Drive.



Charlotte Land Development Standards Manual (CLDSM)



[CLDSM 4000 – Tree Standards & Approved Species List](#)

The [4000 Series](#) of the CLDSM provides technical details and standardized information to be used for design, review, approval, and implementation of construction plans related to tree standards. All design details provided in this manual are approved for use within the City of Charlotte and its extraterritorial jurisdiction unless otherwise noted. Please visit the [Charlotte Development Center's](#) website for more information on the CLDSM, development regulations, and permitting processes.

The Approved Species List can be found in the CLDSM's Specifications and Special Provisions Notes section starting [on page 19](#). This list provides guidance and standardized information related to appropriate and permitted tree and shrub species for various planting and preservation situations. This list is NOT the same as the Native NC Tree Species List.

Updates to the CLDSM 4000 Series – Tree Standards and Approved Species List will coincide with annual updates to the Charlotte Tree Manual (CTM). The Charlotte Tree Advisory Commission (CTAC) and the Development Services Technical Advisory Committee (DSTAC) review these updates and provide feedback, guidance, and recommendations to staff during update process for these 2 manuals.

The City's [Landscape Construction Standards Manual](#) provides technical guidance for City-funded construction related to trees and landscape management items.

These manuals along with the UDO and Charlotte Tree Ordinance are key elements for the implementation of the City of Charlotte's overall tree canopy policy objectives.