



CREDIT FOR EXISTING TREES

Trees located on a residential lot can provide some benefit to storm water runoff reduction and can be used for credit in reducing the total net impervious area on a residential infill sites. Trees reduce runoff through rainfall interception by the tree canopy, by releasing water into the atmosphere through evapotranspiration, and by promoting infiltration and storage of water in the soil.

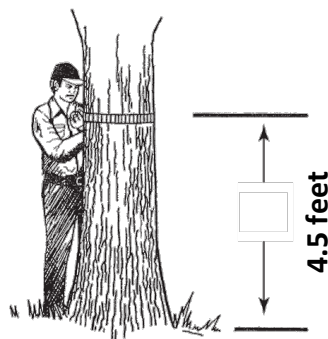
CRITERIA

Each tree with an Adjusted Diameter Breast Height (ADBH) of 8 inches or greater can reduce the impervious area by 50 square feet if certain conditions are met:

- No more than 20% of the net added impervious area (IA = Net Increase in impervious area) can be mitigated with the credit. Maximum Tree Credit rounded down to nearest 50 square feet.
- The location, species, and size of each tree being counted for credit is shown on the plan of record. A picture of the tree should be included with the application. For tree identification: <https://mdc.mo.gov/field-guide/search?fgSpeciesType=1009>
- The tree is protected as per **Kirkwood Tree Manual** during construction: (<https://www.kirkwoodmo.org/home/showpublisheddocument/3719/637630007386600000>)
- With the exception of the Vegetated Filter Strip Green Infrastructure Control, trees that are located within the boundaries of the constructed stormwater infrastructure features cannot be counted for Infill Stormwater Credit.

If the protected tree(s) dies or is removed, the property owner may be subject to enforcement and will be responsible for providing impervious area treatment. This may include planting and maintaining additional trees or installing Green Infrastructure Controls.

MEASURING DBH



DBH refers to the tree diameter measured at 4.5 feet above the ground.

- If tree is at an angle or on a slope, measurement is taken from the midpoint of the different ground levels of the tree along the center of the trunk.
- If the tree forks at or below the 4.5 feet point, or if a bulge occurs at this point, take the measurement at a location lower on the trunk where the tree resumes its normal size or taper. For a root bulge, begin measurement at the point where the root mass ends.

To properly determine the diameter, measure the length (circumference) around the trunk (to nearest inch) and divide by 3.14; report to nearest inch. Be sure tape measure is straight and not caught in any branches or other obstacles. DBH and ADBH are reported to nearest 0.1 of inch.

Figure 1: Measuring DBH (INDNR: Forestry: How to Measure and Identify Big Trees)



ADJUSTED DIAMETER

To calculate the tree's ADBH, the DBH is multiplied by the tree's condition rating.

- The Condition Rating is the numerical expression of a tree's condition expressed as a percentage from zero (a dead tree) to 100 (a perfectly healthy tree as described in the manual Guide for Plant Appraisal published by the International Society of Arboriculture). Use table below (20%, 40%, 60%, 80%, or 100%).
- For example, if a tree has a DBH of 32 inches in diameter and is in relatively poor health with a condition rating of 40%, its ADBH is 12.8 inches. ($32'' \times 0.40 = 12.8''$)

CONDITION RATING FOR LANDSCAPE TREES

Condition Rating	Tree Structure Consider root condition/formation, trunk condition and branch assembly and arrangement	Tree Health Consider crown indicators including vigor, density, leaf size, quality and stem shoot extensions	Formula Values (% Used)
Excellent	Root plate undisturbed and clear of any obstructions. Root flare has normal development. No visible trunk defects or cavities. Branch spacing/structure and attachments are free of any defects.	Perfect specimen with excellent form and vigor, well-balanced crown. Trunk is sound and solid. No apparent pest problems. Normal to exceeding shoot length on new growth. Leaf size and color normal. Exceptional life expectancy for the species.	1.0-.90 (100%)
Good	Root plate appears normal; only minor damage may be found. Possible signs of root dysfunction around trunk flare. Minor trunk defects from previous injury, with good closure; less than 25% of bark section is missing. Good branch habit, minor dieback with some signs of previous pruning. Codominant stem formation may be present. Minor corrections required.	Imperfect canopy density in few parts of the tree, 10% or less, lacking natural symmetry. Less than half normal growth rate and minor deficiency in leaf development. Few pest issues or damage, controllable. Normal branch and stem development with healthy growth. Typical life expectancy for the species.	.90-.75 (80%)
Fair	Root plate reveals previous damage or disturbance and dysfunctional roots may be visible around main stem. Evidence of trunk damage or cavities with decay or defects present. Less than 30% of bark sections missing on trunk. Codominant stems are present. Branching habit and attachments indicate poor pruning or damage, which requires moderate corrections.	Crown decline and dieback up to 30% of the canopy. Overall poor symmetry. Leaf color somewhat chlorotic with smaller leaves. Shoot extensions indicate some stunting and stressed growing conditions. Obvious signs of pest problems contributing to lesser condition. Some decay areas found in main stem and branches. Below average life expectancy.	.75-.50 (60%)
Poor	Root plate disturbance and defects indicate major damage with girdling roots around the trunk flare. Trunk reveals more than 50% of bark section missing. Branch structure has poor attachments, with several structurally important dead or broken. Canopy reveals signs of damage or previous topping or lion-tailing, with major corrective actions required.	Lacking full crown, more than 50% decline and dieback, especially affecting larger branches. Stunting obvious with little evidence of growth on smaller stems. Leaf size and color reveals overall stress in the plant. Insect or disease infestation may be severe. Extensive decay or hollow. Life expectancy is low.	.50-.30 (40%)
Very Poor	Severe damage within the root plate and root collar exhibits major defect which could lead to death or failure. A majority of the bark or trunk is affected with decay or missing. Branching is extremely poor or severely topped with severe dieback in canopy. Little or no opportunity for mitigation of any tree parts.	More than 70% of the canopy is in severe decline or dead. Canopy density is extremely low with chlorotic and necrotic tissue dominating the canopy. Severe decay in the trunk and major branches. Root plate damage with a majority of roots damaged, diseased or missing.	.30-.10 (20%)

Source: <https://tcimag.tcia.org/business/an-introduction-to-tree-appraisal/>

PROVIDE PLAN VIEW OF TREE LOCATIONS AND HOUSE SHOWING DRAINAGE AREA DIRECTED TO THE LOCATION. INCLUDE PROPOSED AREA TO BE MITIGATED BY TREE CREDIT (NOT TO EXCEED MAXIMUM TREE CREDIT).

Address:		Mitigated Area:			SF (square feet)
Permit Number:	P	Max Tree Credit:			Lowest 50 SF (square feet)
Net Imperious Area (SF):					

Tree ID	Tree Common Name	Circumference (inches)	DBH (inches)	Condition (percentage)	ADBH (inches)	Tree Credit (Square feet)
Total Available Tree Credit:						

Notes:

1. Net Impervious Area = Proposed Impervious Area - Existing Impervious Area, in square feet
2. Maximum Tree Credit = 20% x (Net Impervious Area), in square feet
3. Diameter Breast Height (DBH) = Circumference / 3.14, to nearest 0.1 of an inch (Circumference measured 4.5 feet above the ground)
4. Condition rating is one of the following: 20%, 40%, 60%, 80%, or 100%. No dead trees are permitted for use (0% rating)
5. ADBH = Adjusted DBH = Condition Rating % x DBH, to nearest 0.1 of an inch
6. Tree credit of 50 square feet applies only to a tree with an ADBH ≥ 8 inches

1. THERE IS NO INITIAL INSPECTION. IDENTIFY TREES TO BE COUNTED.
FINAL INSPECTION POINT

2. MULCH.

- a. MULCH TREE WITH A 2-4 INCH LAYER OF MULCH IN A DOUGHNUT-SHAPED RING. THE RING SHOULD EXTEND 2' TO 4' BEYOND THE TRUNK.
 - b. DO NOT PILE MULCH AGAINST THE TREE TRUNK. PULL MULCH BACK SEVERAL INCHES FROM THE TRUNK SO THE BASE OF THE ROOT CROWN IS EXPOSED. AVOID A "MULCH VOLCANO".
3. PRUNING. (see City of Kirkwood Tree Manual)
 - a. AVOID OVER-PRUNING OF TREE BY ONLY REMOVING A SMALL PERCENTAGE OF THE LIVE TREE AT ONE TIME TO A MAX OF 25% IN ONE YEAR.
 - b. HEAVY PRUNING SHOULD BE PERFORMED IN THE WINTER MONTHS.
 - c. AVOID LIGHT PRUNING IN EARLY SPRING.
 - d. DEAD AND DYING BRANCHES CAN BE PRUNED ANYTIME.

CITY OF KIRKWOOD	ATTACH	THIS	ONE-PAGE	TREE INCENTIVE SPECIFICATIONS
PROPERTY ADDRESS:	SPECIFICATION	TO	SITE PLAN	PAGE 1 OF 1
DATE:	SUBMITTAL			



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