



Low Impact Development Technical Workshop - Tree Preservation Handout

The process of tree preservation on an LID project may be categorized into nine (9) sequential elements:

1. Perform a tree stand delineation: This is a survey of all the trees over 6 inches diameter included, shrub masses, and hedges or other significant vegetation. The survey should include grade elevations and site features such as critical areas and infrastructure. This is performed by a licensed survey crew.
2. Tree inventory within development: This is completed by an International Society of Arboriculture (ISA) Certified Arborist and should focus on collecting information on species, diameter, tree risk assessment, and the trees' health and condition.
3. Identify trees suitable for preservation: ISA Certified Arborist to determine the suitability of trees' for retention based on tree inventory findings. At this stage the arborist identifies the most worthy trees to retain and the critical root zone for each tree (see next page of handout).
4. Assess potential impacts to trees: ISA Certified Arborist to review all available plans and work to be completed. The arborist reviews this in conjunction with the information collected for tree inventory and the determined suitability for preservation of each tree.
5. Suggest modifications to development plans: The ISA Certified Arborist may suggest modifications to planned grading, utility alignment, stormwater drainage, and positioning infrastructure i.e. buildings, roads, sidewalk. This takes account of suitability for preservation and potential impacts.
6. Identify tree work required before clearing and grading: ISA Certified Arborist uses information collected in tree inventory to determine work required on trees identified for preservation i.e. removing hazards, clearance for work, and maintenance treatments.
7. Prepare specification/guidelines for tree preservation: ISA Certified Arborist specifies the critical root zone and provides general tree protection guidelines. Arborist specifies methods to protect trees when working near trees. The arborist may also specify methods required to improve tree growing conditions.
8. Monitor trees: Inspection of the retained trees by ISA Certified Arborist during construction; monitoring reports with instructions provided for tree protection, and ensuring compliance with general tree protection guidelines.
9. Post-construction maintenance plan: ISA Certified Arborist to provide a plan for the care of trees following completion of work. This may include re-inspection and monitoring reports; reports may include specifications for treatment of work impacts and providing growth improvement.

The primary method to protect established trees during construction is to limit:

- Trenching,
- Grading,
- and soil disturbance and compaction

within the Critical Root Zone (CRZ) of the retained tree. The Critical Root Zone (CRZ) of a tree is based on the trees trunk diameter at 4.5 feet height. However, when considering if work can occur within this zone, the species tolerance and condition should also be considered.

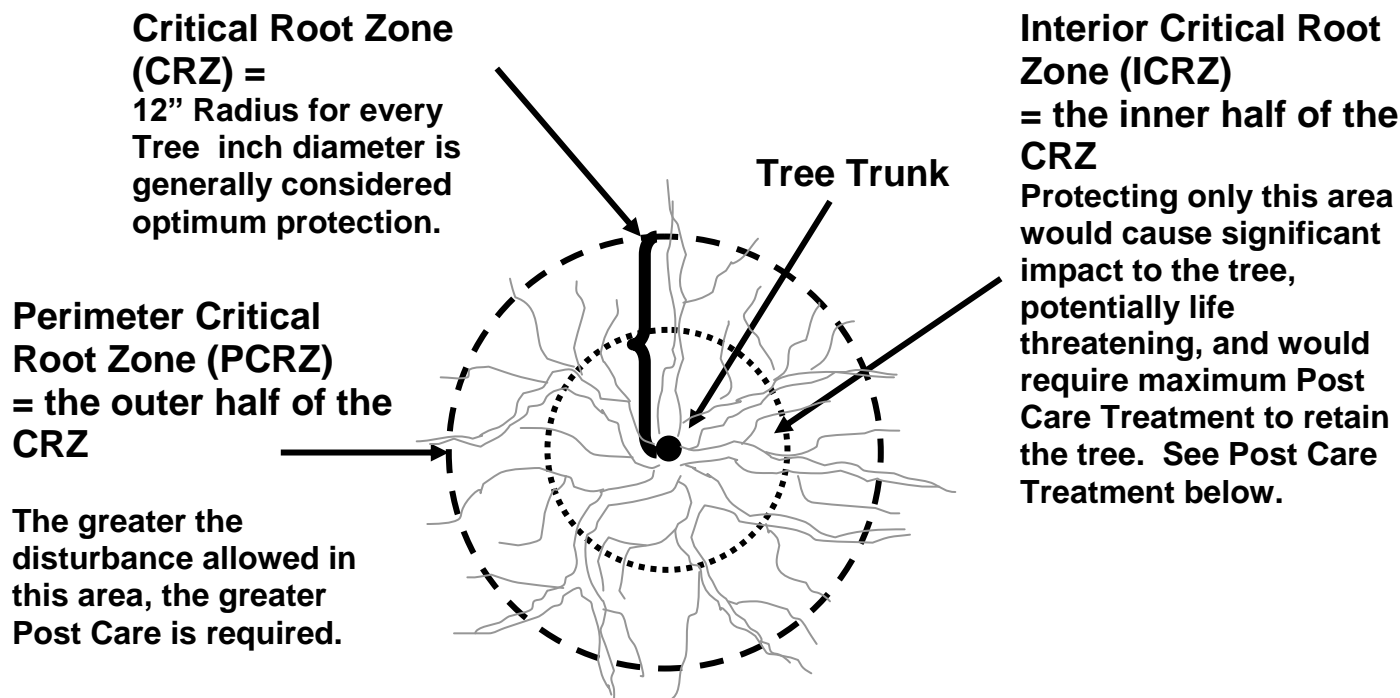
Protecting soils from compaction or grading is critical because tree preservation is based on preserving the soils structure important for maintaining root condition and growth. Trees have two forms of primary roots 1) structural roots important to stability; at 60-90 cm / 24-36 inch depth 2) absorbing roots; situated in the upper 30 cm / 12 inches of soil.

A reference for tree preservation is: Matheny N. and Clark J. *Trees and Development: A Technical Guide to the Preservation of Trees During Land Development*, ISA, 1993 pp183

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The Critical Root Zone (CRZ) of a tree is established on the basis of the trunk diameter. The CRZ is a circular area which has a radius of 12 inches to every inch diameter of trunk measured at 4.5 feet above grade. Root systems will vary both in depth and spread depending on size of tree, soils, water table, species and other factors. However, this CRZ description is generally accepted in the tree industry. Protecting this entire area should result in no adverse impact to the tree.

The above CRZ drawing has been further differentiated into the 'Perimeter' (PCRZ) and 'Interior' (ICRZ) to help define potential impact and required Post Care. Generally, the full PCRZ is considered the optimum amount of root protection for a tree. As one encroaches into the "Perimeter CRZ, but not into the "Interior CRZ" the greater Post Care the tree would require to remain alive and stable. The 'Interior CRZ is half the radius of the full PCRZ. Disturbance into the ICRZ could destabilize or cause the tree to decline.

The absolute maximum disturbance allowed should leave the 'Interior' CRZ undisturbed if the tree is to have any chance of survival. This 'Interior' CRZ would approximately equal the size of a rootball needed to transplant this tree which in turn would require extensive Post Care and possibly guying. Post Care Treatment includes but may not be limited to; regular irrigation, misting, root treatment with special root hormones, mulching, guying and monitoring for several years.



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Title: Explanation of Critical Root Zone (CRZ)
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Not to Scale