The Crown and Root Structure of a Healthy Tree

A good understanding of the fundamental structural elements of healthy existing trees helps determine how to best protect and reduce the risk of injury to existing trees, especially during construction. **The Crown and Root Structure of a Healthy Tree** is discussed below, and illustrated in **Figure 1** on the next page.

- Tree roots are vital for tree survival and stability;
- Tree roots can extend 2 – 3 times beyond the dripline;
- The critical structural root zone extends directly from the trunk with anchor roots. Long transport roots extend outwards from anchor roots. Together the anchor and transport roots provide the main structural framework for trees;
- A complex network of fine, non-woody feeder roots extend outward and upward from the transport roots. The feeder roots are entirely responsible for the air, water and nutrient uptake that sustain tree life;
- Water and nutrients travel from feeder roots up the trunk and branches in tissue just below the bark;
- 90% of feeder roots are found in the top 30 cm of soil;
- Roots are easily damaged or killed by soil compaction and alterations to existing grades;
- Broken branches and torn bark are opportunities for insect and decay to get into a tree;
- Damage to the canopy, including leaves and branches, reduces the capacity of the tree for photosynthesis, limiting the availability of energy for growth; and
- Impacts from disturbance to trees cause a decline in tree vigour and overall health, leading to the eventual death of a tree after the disruption years later.

For more information, contact

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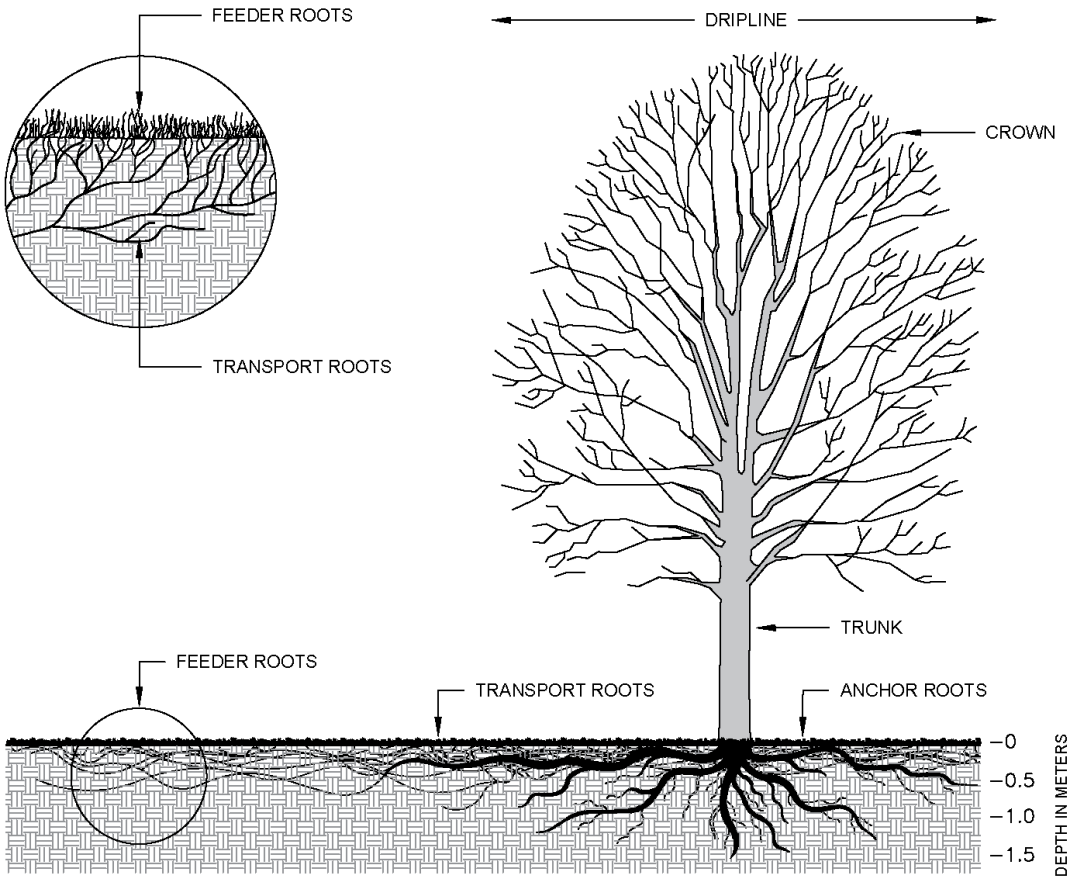

NOTES:

THE ROOT SYSTEM OF A TREE GROWS MAINLY WITHIN THE TOP 60cm OF THE SURFACE OF GOOD QUALITY, WELL DRAINED AND UNCOMPACTED SOIL.

THE ROOT SYSTEM CAN EXTEND TO MORE THAN 2 TO 3 TIMES THE DRIPLINE DISTANCE

THE ROOT SYSTEM OF A TREE HAS THREE MAIN PARTS:

ANCHOR ROOTS - FORMING THE BASE OF THE TREE ARE LARGE ANCHOR ROOTS WHOSE MAIN FUNCTION IS TO HOLD THE PLANT IN PLACE IN THE SOIL.

TRANSPORT ROOTS - EXTENDING FROM THE ANCHOR ROOTS ARE LONG TRANSPORT ROOTS, WHICH TOGETHER PROVIDE THE MAIN STRUCTURAL FRAMEWORK FOR THE PLANT. TRANSPORT ROOTS MAIN FUNCTION ARE TO PROVIDE WATER & NUTRIENT TRANSPORTATION FROM THE SOIL TO THE PLANT.

FEEDER ROOTS - GROWING OUTWARD FROM THE TRANSPORT ROOTS ARE A COMPLEX NETWORK OF FEEDER ROOTS. THESE NON-WOODY ROOTS BRANCH OUT TO FORM FANS OF THOUSANDS OF SLENDER ROOTS WITH FINE HAIRS. THESE TINY ROOTS PROVIDE THE SURFACE WHERE THE ABSORPTION OF AIR, WATER AND NUTRIENTS TAKES PLACE THAT SUSTAIN THE LIFE OF THE TREE.

Figure 1: Crown and Root Structure of a Healthy Tree

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