



Street Tree Standard

GUIDELINES FOR QUALITY ASSURANCE

At Leafland, we believe that a quality tree is nurtured from ground to crown. This specification is for the supply of healthy, vigorous tree and plant materials that are disease, damage and defect free. This standard can be used during inspection of trees supplied for street plantings, to ensure the trees quality is adequate.

Trees and plants

1. **Identification:** Trees shall be clearly labelled until planted.
2. **Health and Vigour:** The size, colour and appearance of leaves should be typical for the time of year and stage of growth of the species/cultivar. Leaves should not be stunted, misshapen, discoloured or otherwise atypical. Foliage shall be hardened off for the conditions in which the tree is to be planted and substantially free from chlorosis and necrosis. Extension growth should be typical for the time of year and stage of growth of the species/cultivar with no die back.
3. **Pest and Disease:** Trees shall be free of pest or disease infestation.
4. **Injury:** Trees shall show no evidence of foliage damage (e.g. distortion from herbicides or frost) or trunk or branch damage (e.g. ties too tight, sunburn, rough handling, mechanical, inappropriate care in transit, frost damage, wind damage, snow damage).
5. **Self-Supporting:** Trees shall be able to support themselves in an upright position with a full head of foliage while standing in the container and also after planting without the use of canes or stakes. The trunk should be rigid for the lower quarter to half of its height, becoming gradually more flexible through the upper half. The trunk should be able to bend by approximately 30° side to side without the container lifting off the ground when the tree is bent at 80% of the tree's height, and shall return to an upright position after the test has been completed. This test shall be undertaken after the cane has been removed.
6. **Trunk:** The trunk shall be strong, upright and reasonably straight, firm in the container. It should be free from wounds and blemishes. It must have a taper which is appropriate to the species and evident from root to crown, such that the calliper at any given point on the trunk must be greater than the calliper at any higher point on the trunk. Trunk taper is the increase in calliper size down the stem and is a

response to the tree's physical movement and presence of branch attachments while it is growing. An un-tapered, parallel trunk may be accepted where it is a species/cultivar characteristic e.g. standard cherries, *Pseudopanax* spp. Straightness of trunk can be species dependent (e.g. *Araucaria columnaris*, *Carpinus betulus*, *Koelreutaria paniculata*, some *Sophora*).

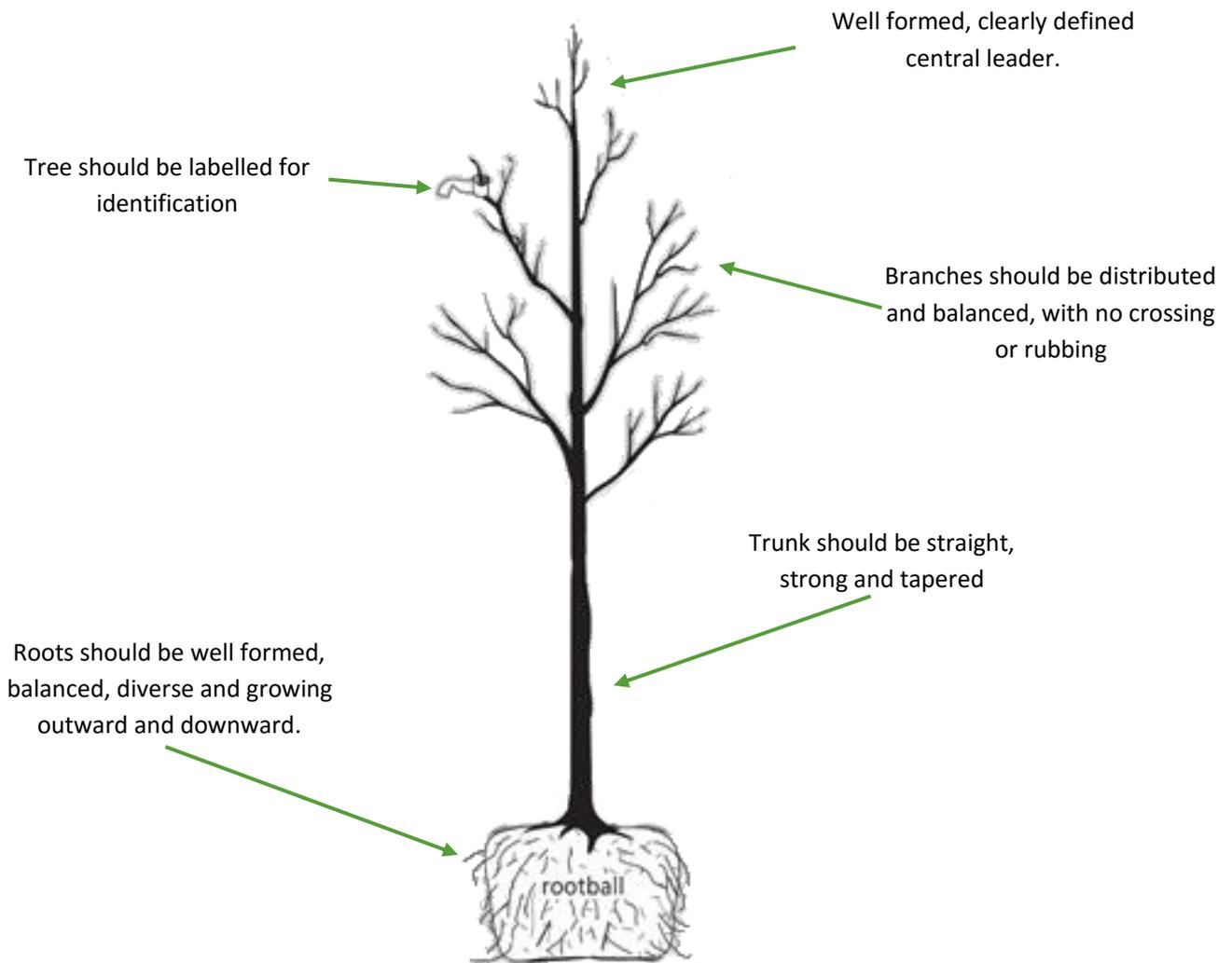
7. **Pruning:** Pruning practices shall benefit the tree's development. Pruning shall be undertaken to internationally-recognised arboricultural standards, practices and procedures. Trees shall not be pruned just before shipping. With the exception of standard cultivars (e.g. cherries) clean trunk height shall not exceed 40% of the total tree height. The diameter of any wound shall not exceed 50% of the diameter of the trunk immediately above the point of pruning.
8. **Central Leader:** Both excurrent and decurrent form trees should have a relatively straight, well formed, clearly-defined, central leader for the height of the tree, with the apical bud intact. Trunks shall be free of co-dominant stems (double leaders) and large vigorous upright growing branches that will compete with the central leader. This does not apply to multistem, weeping or other tree forms where a straight leader is not a natural characteristic.
9. **Form and Symmetry:** Form and habit should be true to species, with no crossing or rubbing branches, and a well-balanced appearance. The difference in crown distribution on opposite sides in any aspect should not exceed 20%. Branches should be distributed radially around (species dependent) and vertically along the trunk, not clustered in several areas, and should be no greater than 50% of the diameter of the trunk, measured 20mm above the branch bark ridge. It is recognised that species vary in their branching habit and some species are sparingly branched as juveniles. Some native trees have a marked juvenile stage that differs from the adult tree. The form should not be misshapen by breakage, wind, pruning practises, pests, spacing or other factors.
10. **Included Bark:** Trees shall be free of included bark. Included bark is where the branch bark ridge fails to expand outwards and, as the trunk and branch continue growing, it becomes more and more enclosed. Branch bark ridges that are included (concave) are considerably weaker than those with a prominent ridge line (convex). Some included bark will be tolerated in species where it naturally occurs e.g. kowhai, *Tilia*, *Plagianthus*, *Ulmus*.
11. **Graft Unions:** Graft unions shall be sound and the scion and rootstock compatible. The union of the scion and rootstock shall be well knitted and show no obvious signs of incompatibility for the entire circumference of the graft. Graft unions are often different diameters and this does not indicate incompatibility.
12. **Roots:** Roots shall be free of decay and damage. The tree should have a well-formed, diverse and balanced root system with no kinked, circling or girdling roots. To allow roots to have an even 360° spread, the centre of the trunk be approximately central in the container. Roots shall grow in a generally outwards and downwards direction.

Shaving, pruning or peeling off the shell of roots on the periphery and bottom of the root ball and teasing the roots out cuts away most defects, but if this is not the case, roots that are distorted as a result of inappropriate growing practices should not be accepted. Water management is critical after root pruning to avoid severe wilting and stress.

13. **Rootball Occupancy:** The root system shall fully occupy, and be well established in the container. Once the container is removed, 90% of the soil volume shall remain intact. When lifted by the trunk, the trunk and rootball shall move as one unit. The outer edge of the rootball shall be free of woody circling roots and the base free of matted roots. The trunk shall not be loose in the container.
14. **Height of Root Collar:** The root collar should be within the top 1-2 inches of soil, just below the surface of the root ball, with no large root crossing over the main roots.
15. **Maintenance:** Container trees shall be weed free and moist.
16. **Open Ground Trees:** Open ground trees shall be lifted at the nursery with minimum damage to the roots and with maximum retention of roots. Open ground trees shall have as much soil as possible retained around the rootball. Evergreen trees shall be individually wrapped. All root balls shall be contained in moisture retentive material.

Transport

17. **Supply and Collection:** Trees and plants shall be handled with care at all times, lifted by the container and placed on the ground or into vehicles. Trees and plants should remain thoroughly watered before they are transported from the nursery.
18. **Transportation and Storage:** All tree and plant material shall be carefully packed and protected during transport to the site to prevent damage. Foliage shall be protected from desiccation during transportation. Plant roots shall be protected at all times from drying out. Bare rooted plants, such as trees, shall have individual root balls contained in moisture retentive material. Plants and trees should be planted as soon as possible, but until then should be stores in shade, well protected, sheltered and well-watered.



PLANTING GUIDE

1. **Timing:** Planting should take place at an appropriate time for the conditions and needs of the tree and environment, generally between 1 April and 30 September (the planting season).
2. **Container Trees:** Containerised trees shall be thoroughly moistened at the time of planting. If the soil is dry, the plant shall be submerged in water for five minutes until air bubbles stop rising. Allow time to drain before planting. Balled and container grown plants shall have the cloth cordage, container, wire containment and hessian removed immediately prior to planting. Care shall be taken to ensure that the root ball is not disturbed during container removal or planting. If plants are slightly potbound the roots shall be loosened, trimmed and spread out to ensure healthy growth. Roots shall not be exposed to the sun or wind.
3. **Tree Pit:** Tree pits should be dug to a larger than (up to three times) the size of the root ball to be planted. The bottom of the pit should be forked over to facilitate root penetration, air movement and free drainage.
4. **Fertilisers:** If needed, fertiliser should be thoroughly mixed with the soil in the base of the planting hole, prior to planting. Long-term fertilizer tablets can also be used, which should be placed in the root zone of the tree at planting.
5. **Planting:** Trees shall be set upright in the centre of the pit at such a depth that the soil, when firmed down, is at the same height as the top of the root ball. Soil shall be heeled in using natural body weight and not compacted by machinery or 'stamped' down. Any major roots that accidentally break off or fray shall be cleanly cut off flush with the root ball using sharp secateurs or a handsaw. Where roots are pot bound and/or girdling they shall be cleanly severed at the edge of the root ball and gently teased out in a radial fashion. A short section of nova-flow pipe buried in the ground beside the root ball, with the top left protruding so the root zone can be watered directly in the future, is recommended. Loose roots shall be spread out in a radial fashion and the pit progressively backfilled with first class topsoil, carefully placed under and amongst them to fill all voids and consolidated so that no air pockets are present and the tree is firmly held. For bare root stock the soil shall be heeled firmly round the root collar. The tree should be watered thoroughly after planting, ensuring that the moisture has penetrated to the full depth of the root ball (initial watering is also important to settle the soil around the roots).
6. **Staking:** Stakes should be used to support the tree for at least the first year, to hold the root ball from movement to allow new roots to establish themselves in the surrounding soil. Stakes should be driven into the ground to a depth sufficient to support the tree, and should be upright and immovable. For larger trees, three stakes positioned beyond the root ball is recommended. Tie the tree using something soft and non-abrasive (e.g. old tyre tubing or jute (Hessian)), to allow minor movement without

chafing of the stems, and to allow the development of supportive 'reaction wood' and a strong supporting root system. Ties should be positioned approximately one-third of the height of the tree from the ground (up to a maximum of approximately 1m) and the top of the tree left to sway in the wind which will strengthen it.

7. **Stem Protectors:** If required, the tree stem should be protected with flexible corrugated and perforated PVC pipe installed around the base of the plant and secured into the ground.
8. **Root barriers:** In the use of root barriers, the barrier should be centred about the stem. Each barrier shall be impermeable to penetration by roots, a minimum of 2000mm length and 300mm depth. The top of the root barrier shall be level with the surrounding surfaces i.e. not protruding above the surface. All root barriers shall be installed prior to the planting of trees or as specified.
9. **Mulching:** Mulching impedes water loss through evaporation from the soil surrounding the plant, and suppresses weed growth. Grass should be removed prior to mulch being applied. 3-4 inches of bark/mulch (not lawn clippings) covering the root zone should be applied. Where a mulched area is adjacent to a hard surface, mulch should be flush with or no more than 25mm below the surrounding surfaces. Mulch to tree pits in reserves shall be placed over the tree pit radially to 1000mm from the trunk of the tree or to the extremity of the tree's drip line, whichever is the greater. Mulch to tree pits in streets shall be spread radially to 600mm from the trunk of the tree. Mulch shall not touch the stems of plants. A small circle shall be cleared (diameter of 50mm minimum) around the stem to avoid stem rot. Mulch shall be pulled back to 100mm off the trunk of any tree to prevent collar rot. Topsoil shall not be mixed into the mulch during placement, planting or weeding.
10. **Establishment:** After planting, the tree must be maintained through watering and weed control and also occasional works such as some plant protection, fertilizing and pruning. After planting, the tree should be healthy with no evidence of decline or damage (e.g. dead/dying/diseased foliage/tips/branches, loss of foliage that is uncharacteristic to the species, discoloured foliage, pests and diseases). If top-feed fertilizer is used, this should be sprinkled around the base of the tree at six week intervals between October and mid-January.