

1.0 **GENERAL**

1.1 **Scope**

- .1 This guideline addresses the requirements for the transplanting of existing trees and plants, plus materials and equipment required to transplant and establish trees and plants in their new locations as shown on site development drawings.

1.2 **References and Standards**

- .1 Canadian Landscape Standard, current edition
- .2 International Society of Arboriculture (ISA), Planting Specification, Tree and Shrub Transplanting
- .3 International Society of Arboriculture (ISA), Best Management Practices - Tree Planting

1.3 **Coordination**

- .1 Coordinate as early as possible in the conceptual and design development phases with UBCO Facilities Manager of Landscape and Building Services.
- .2 Coordinate throughout construction phases with UBCO Facilities Manager of Landscape and Building Services regarding any site changes, potential damages or pruning required on relocated trees retained.

1.4 **Related Work**

- .1 Section 32 01 93.01 Tree and Shrub Preservation
- .2 Section 32 00 00 Irrigation Guidelines
- .3 Section 32 91 00 Plant Preparation
- .4 Section 32 93 00 Plants

2.0 **MATERIALS AND DESIGN REQUIREMENTS**

2.1 **Tree Relocation and Protection Plans**

- .1 For trees to be protected and/or retained on site, the Project Landscape Architect or UBCO Facilities Manager of Landscape and Building Services should provide Tree Protection/Relocation Plans indicating surveyed grades at base of trunks, DBH, extents of drip lines and location of Tree Protection Fencing. Specifications and cross-sectional details for applicable preservation strategies including, but not limited to, requirements covered in this general guideline must be included in construction documents.

2.2 **Consulting Arborists and UBCO Facilities Manager of Landscape and Building Services**

- .1 Where significant heritage trees, or complex tree preservation strategies are anticipated, UBC recommends that a project-specific, ASCA Registered Consulting Arborist be retained as an integral member of the design development team. The Consulting Arborist is to advise on specific pre- and post-development strategies or to provide expert analysis, details and/or specifications required to optimize tree retention and preservation.
- .2 The UBCO Facilities Manager of Landscape and Building Services will be UBCO's representative on Campus and will advise on related Campus tree issues with consultants, project managers and site supervisors as required.

2.3 Coordination, Inspection and Supervision

- .1 The UBCO Facilities Manager of Landscape and Building Services, Project Landscape Architect, Project Consulting Arborist shall coordinate as early as possible in the project to identify trees to be retained, protected, transplanted or removed and clearly establish tree relocation strategies for on-site or off-site locations.
- .2 Every effort should be made to coordinate transplanting to occur in the dormant season or otherwise optimize conditions for transplanting in conjunction with site development timing and priorities.
- .3 Qualified Landscape Contractor or authorized Tree Mover shall be responsible for transplanting of existing trees or shrubs to be relocated including preparation of site and coordination with Project Landscape Architect, Project Consulting Arborist and/or UBCO Facilities Manager of Landscape and Building Services.
- .4 The Contractor responsible must follow relocation instructions as per the Project Landscape Architect's directions in consultation with Project Consulting Arborist and/or UBCO Facilities Manager of Landscape and Building Services. Existing trees to be transplanted on-site shall be relocated as shown on the project drawings. Existing trees to be transplanted off-site shall be coordinated with the UBCO Facilities Manager of Landscape and Building Services.
- .5 The Project Landscape Architect, the Consulting Arborist and/or the UBCO Facilities Manager of Landscape and Building Services shall be on site to monitor the relocation operations as required. The Contractor will provide minimum 48 hours' notice prior to relocation operations.
- .6 During the construction phase, the Contractor responsible shall contact UBCO Facilities Manager of Landscape and Building Services immediately regarding any site changes impacting tree relocation and preservation.

2.4 Site Conditions and Preparation

- .1 Protect all existing trees, shrubs, properties, services and buildings from any potential damages from tree relocation work. (Refer to Section 32 01 93.01 Tree and Shrub Preservation).
- .2 Consult with UBCO Facilities Manager of Landscape and Building Services regarding any underground services prior to commencement of work. Ensure work area is free from overhead, above ground and below ground hazards or utilities. Consult with UBCO Facilities Manager of Landscape and Building Services regarding any unforeseen hazards, structures or services prior to moving trees or shrubs.
- .3 Check to see that sufficient access and room exist around the designated trees to achieve the specified root ball sizes with the stem centred on the root ball.
- .4 Check target locations for relocating plant material to ensure adequate access, soil quality and drainage.
- .5 Ensure that soil texture, fertility and drainage at the new planting site(s) is acceptable, and that new transplant site provides analogous cultural conditions to original site. (Refer to Section 32 91 00 Planting Preparation).

2.5 Maintenance

- .1 Maintenance of all relocated/transplanted trees and plant material at either on-site, or off-site heel-in/holding compounds will be the responsibility of the Contractor for the duration of the project and maintenance period.
- .2 Maintenance of all relocated/transplanted trees and plant materials to off-site, permanent planting locations, will be the responsibility of UBCO Facilities Management after project completion and turn-over unless otherwise specified.

2.6 Guaranty

- .1 Unless otherwise specified, the Contractor will not be required to guaranty transplanted trees and plant materials, but will be required to do all work as specified under the direction of the Project Landscape Architect in consultation with Project Consulting Arborist and/or UBCO Facilities Manager of Landscape and Building Services at the time of the plant moving.

2.7 Replacement

- .1 When specified in the contract drawings and documents, the Contractor shall be responsible to replace any damaged existing trees and plant material to be relocated in the same genus, species, size and character at no cost to UBC.

2.8 Existing Tree and Plant Material

- .1 Existing trees and plant materials designated for relocation shall be clearly tagged and indicated on demolition plans, site preparation plans and planting plans.
- .2 Trees and plant material designated as bareroot or collected transplants shall conform to the Canadian Standards for Nursery Stock. Those that cannot be planted right away shall be protected from sun or drying winds and kept in shade. Roots shall be well protected with soil, wet mulch and kept watered.
- .3 As far as practicable, transplanted B&B trees and plant material shall be properly dug with firm, natural balls of soil retaining as many fibrous roots as possible, in sizes and shapes as specified in the Canadian Standards for Nursery Stock.

2.9 Materials

- .1 Unless a tree or shrub is moved in one operation, directly to new site within a tree spade, rootballs shall be firmly wrapped with non-synthetic, rottable burlap secured with heavy non-synthetic, rottable twine.
- .2 Balls shall be firmly wrapped with non-synthetic, rottable burlap and secured with nails and/or heavy, non-synthetic rottable twine. The root collar shall be apparent at surface of ball. Trees and plant material with loose, broken root balls shall not be accepted.
- .3 Correctly sized wire baskets capable of accommodating the rootballs of trees and large shrubs may be used to facilitate movement, storage and rootball integrity.
- .4 Anti-desiccants are to be applied to plants in full leaf immediately before digging or as required by the Project Landscape Architect in consultation with Project Consulting Arborist and/or UBC Campus Arborist. Anti-desiccants are to be sprayed so that all leaves and branches are covered with a continuous protective film. Anti-desiccant shall be an emulsion

specifically for agricultural use, mixed and applied according to manufacturer's recommendations.

- .5 Anchors shall be Douglas Fir standard or better grade S4S lumber in the following size: 50 x 100 x 1200mm (2" x 4" x 48").
- .6 Tree wraps shall be 8 -10cm wide nylon strapping three (3) per tree, 0.75m in length, with galvanized metal eyes at either end.
- .7 Guy wire and safety sleeves shall be galvanized 11 gauge wire with brightly coloured survey plastic sleeves covering the bottom 1.5m of each section.
- .8 Turnbuckles shall be galvanized and a minimum body length of 150mm (6").

2.10 Fertilizer

- .1 Slow release fertilizer such as 18-6-12 Osmocote or approved equivalent.

2.11 Complete Chip Mulch

- .1 Tree mulch shall be complete tree chip mulch, including parts of the leaf, twig, bark and stem wood. This product may be obtained from local tree contractors or UBC Landscape Services, generally free of charge. The mulch should be free of pests or diseases and should not contain Western Red cedar or Black walnut.
- .2 Provide a sample of the proposed tree mulch and its source for approval by the Consulting Arborist and/or UBC Campus Arborist.

2.12 Planting Soil

- .1 Refer to Section 32 91 00 Planting Preparation for general specifications on use of native topsoils and commercial soil products.
- .2 Horticultural soil products may be mixed with existing soils to a maximum ration of 2:1 (new to old). The amended soil volume required for each tree will fill a void around the outside of the root ball 60cm in depth and equivalent to the radius of the root ball in width. [For example, a tree with a rootball 2m in diameter will require enough soil to fill a trench around the root ball 60cm in depth below existing grade and 1m wide. Additional soil will be required to raise the grade around the perimeter of root ball in its new location in order to form the watering saucers.

2.13 Period of Planting

- .1 Coordinate digging of plant material to be transplanted to ensure minimum time between digging and re-planting.
- .2 Trees and plant material designated for B&B, bareroot or as collected plants, shall not be dug or installed before dormancy or after bud break from late fall to early spring.
- .3 Transplanting outside of the dormant season may occur in special circumstances only in consultation with Project Consulting arborist and/or UBCO Facilities Manager of Landscape and Building Services.

2.14 Protection

- .1 Verify existence and location of any on-site utilities. Consult the UBCO Facilities Manager of Landscape and Building Services immediately for directions as to procedure should any piping or utilities be encountered during excavation.
- .2 Protect existing buildings, equipment, sidewalks, landscaping reference points, monuments and markers. Make good all damage incurred during this work.
- .3 Make every effort to protect all existing plants adjacent to any construction/tree relocation work.
- .4 Erect temporary continuous barriers where necessary to ensure safety of existing plants and trees. Refer to Section 32 01 93.01 Tree and Shrub Preservation for protection fencing specifications.
- .5 Replace, at no expense to UBCO, any trees and plant material damaged as a result of the work of this section.

2.15 Layout, Digging, Transportation, Planting and Securing

- .1 Stake out the exact location for each tree or shrub transplant as shown on the plan.
- .2 Review the staked locations with the UBCO Facilities Manager of Landscape and Building Services prior to digging tree pits.
- .3 In approved locations, dig tree pit holes that are deep enough to accommodate the depth of the root ball without settling beneath the existing grade. The diameter of the planting hole in the upper 60cm of soil should be approximately twice the diameter of the root ball selected for that location.
- .4 Ensure tree pits drain adequately. If drainage is poor, inform the Consulting Arborist.
- .5 Additional excavation of poorly drained material and addition of drainage material shall be carried out as authorized by the Landscape Architect at unit prices agreed to before excavation.
- .6 Dig each plant to the specified root ball diameter using appropriately sized Tree Spade equipment and employing the best trade practices. For trees with stem calipers less than 12cm, minimum root ball diameters will be calculated at 15 times the stem caliper, measured 30cm above grade. [For example, a 10cm. caliper tree will have a root ball no less than 1.5m in diameter.] For trees with stem calipers greater than 12cm, minimum root ball diameters will use a multiplier of 12. [For example, a 20cm caliper tree will have a root ball diameter of no less than 2.4m.] For trees with stem calipers greater than 25 cm, use a multiplier of 10.
- .7 Root balls will be dug, where possible, with the tree stem centered in the root ball. If circumstances preclude obtaining the minimum rootball size with the stem centered on the root ball, the contractor will consult with the Project Consulting Arborist or UBCO Facilities Manager of Landscape and Building Services before proceeding.
- .8 If, in the opinion of the contractor, the stability of the root ball or the tree will be compromised in the new planting site, the contractor is instructed to basket the root balls and ensure that the root balls are adequately strapped in burlap prior to transport. The contractor must ensure that the root plates of the relocated trees are stable and the trees are windfirm in their new sites. The contractor has the discretion to utilize wire baskets and or staking materials

and techniques (see below) as his judgment directs. Relocated trees must remain completely windfirm for the duration of the maintenance period (12 months).

- .9 Transport the plants immediately to the approved planting area and plant.
- .10 Tree Saucers:
 - .1 Make a saucer around each tree with a berm of soil approximately 150mm (6") higher than the top of the earth ball, 900-1200mm (36-48") from the base of the trunk of the tree to facilitate watering.
- .11 Tree Guying:
 - .1 Relocated trees must remain completely windfirm for the duration of the maintenance period (12 months). The contractor is directed to utilize whatever methods reflect the best trade practice of his industry to ensure the stability of the root ball. If, however, in the opinion of the contractor, guying of the tree is required, the following prescription is to be utilized.
 - .2 Equally space three anchors around the tree. Attach tree wraps approximately midway up the stem of the tree. Anchors should be placed at a sufficient distance to achieve a 45 degree angle on the guy. Anchors should be set at right angles to the guy wires and driven in to a depth sufficient to secure the guy (minimum of 80 centimeters).
 - .3 Secure the guy to the tree wrap rings and the anchor with a turnbuckle interposed between the two anchor points. Tension the guys once installed and position the protective sleeves. Provide three (3) guy wires per tree with a turnbuckle set in the centre of each wire.

2.16 Mulch and Fertilizer Application

- .1 Apply 12 – 14 centimeters of complete tree chip mulch to the area of the planting site [i.e. to an area twice the diameter of the root ball].
- .2 Apply fertilizer based on soil test results and incorporate into backfill soil or by surface application. In absence of soil test recommendations, apply approximately 250 grams (1/2 lb) of 18-6-12 Osmocote for each 5 centimetres of caliper per tree. Distribute the Osmocote over the top of the root ball area after mulching.

2.17 Watering

- .1 Immediately after mulching and fertilizing, apply approximately 181 liters (20 gallons) of water per tree at a moderate flow rate. Ensure that flow rate does not liquefy soils and destabilize tree.
- .2 In transplant locations irrigation must conform to UBCO Irrigation Technical Guidelines.

2.18 Pruning

- .1 Prune off any broken or damaged branches to the outer margin of the branch collar. All pruning work to be done by an ISA Certified Arborist in consultation with the Project Consulting Arborist, or UBCO Facilities Manager of Landscape and Building Services.

END OF SECTION