

1.0 **GENERAL**

1.1 **Scope**

- .1 This guideline addresses the handling, care, installation, materials, warranty and replacement of plant material installed for new landscape and building projects on UBCO Campus.

1.2 **Related Work**

- .1 Section 32 93 05 Relocation of Existing Plant Material
- .2 Section 32 91 00 Planting Preparation
- .3 Section 32 92 00 Turf and Grasses
- .4 Section 32 92 23 Sodding
- .5 Section 32 01 90 Operation and Maintenance of Planting

2.0 **MATERIALS AND DESIGN REQUIREMENTS**

2.1 **Pertinent Standards and Legislation**

- .1 All materials and execution to conform to the latest edition of the following standards or as otherwise specified in contract documents:
 - .1 CLNA, Canadian Standards for Nursery Stock, current addition.
 - .2 Canadian Landscape Standard, current addition.
 - .3 ISA / ANSI, ANSI-A300, Standards for Tree Care Operations.

2.2 **Planting Layout, Massing and Plant Selection**

- .1 Consider the limits and frequencies of institutional maintenance practices at UBCO, and design accordingly for efficiency, servicing accessibility, low maintenance, weed control, pest, disease and drought tolerance.
 - .1 Regardless of whether irrigation will be installed on site, the selection of predominately drought tolerant plants should be emphasized.
 - .2 Where stormwater detention features are incorporated into the landscape, careful condition of the full range of hydrological fluctuations throughout the season should be considered. Plant selection and/or supplementary irrigation and drainage should be considered to avoid inappropriate plant selections, or conditions that are unreasonably dynamic. Hydrophilic plants should not be mixed with hydrophobic plants.
 - .3 Massing of plants, in terms of alignment and dimensions, should be such that plantings are accessible by maintenance staff for weeding, pruning trimming without causing undue damage to plantings.
 - .4 Plants selected for massing should be adapted to perform well in massing pattern and resist premature decline due to over-planting, and should be resistant to branch damage from maintenance foot traffic.
 - .5 Fragile plants or plants with intense care requirements should be avoided. Plants should be selected for their robustness and capacity to endure urban conditions.
 - .6 Care should be taken with selection of massing plants for steep slopes to ensure drought tolerance, quick coverage, appropriate growth habit, good vigor, soil stabilizing capacity and limited maintenance requirements. (See Section 31 22 00 Grading regarding slopes).

- .7 Plants should be selected that do not contain toxic substances or produce dusts, exudates or odours that cause irritation, chemical burns, poisoning or allergic reactions. Check authoritative references. See also, WorkSafe BC, Toxic Plant Warnings.
- .8 Avoid plant species that are known to have a high susceptibility to insect and disease infestations. Select plant species that are known to exhibit a high degree of pest and disease resistance.
- .9 Avoid plant species that spread into thickets with underground rhizomes. Where variances to this guideline may have been granted by reviewers, plantings with these characteristics must be contained with enclosed root barrier of the required depth to prohibit root migration into adjacent plantings, structures, buildings, ponds, irrigation or drainage systems.
- .10 Avoid all plant species identified as “Invasive Plants” by the Invasive Species Council of BC.

2.3 Tree Selection and Placement

- .1 In general, tree species selected for use on UBC Campus *conform to the UBCO Campus Design Guidelines Section 2.3 and* should be:
 - .1 Low maintenance.
 - .2 Tolerant of local conditions.
 - .3 Resistant to branch failure and wind-throw.
 - .4 Pest and disease resistant.
 - .5 Structurally sound requiring no significant compensatory or remedial pruning.
 - .6 Free from problem characteristics such as:
 - Heaving root systems.
 - Significantly messy plant parts (i.e. leaves, fruit, seeds etc.)
 - Allergenic or objectionable properties (excessive pollen, dust or malodorous).
- .2 Individual trees selected for planting must be:
 - .1 Nursery trained with a single leader (exception: multi-stemmed species such as Vine Maple).
 - .2 Verified free of pests and diseases.
 - .3 Verified free of pernicious weeds in the rootball or container.
 - .4 Verified free of girdling roots.
- .3 Tree planted within 60 cm of walkway or paved surface must have a 45 cm deep root barrier installed along edge of surfacing prior to addition of topsoil and tree planting.
- .4 Trees should be sited with consideration of their maximum height and spread at maturity. Trees should not be placed:
 - .1 With branches overhanging buildings, light wells or air-intakes.
 - .2 Under overhead signs, canopies, or building overhangs.
 - .3 Too close to building facades, in front of entryways or obstructing walkways, roadways or traffic signage.
 - .4 In significant conflict with site lighting structures or lighting dispersal pattern intentions.
 - .5 Within 1.5 meters of underground utility, valve box, service vault or catch basin etc.
 - .6 In locations that would subject the tree to excessive soil/root compaction due to pedestrian or vehicular traffic.
 - .7 In extensively built-out locations with limited soil volume, such as narrow plantings, between roads and walkways or narrow roadway medians, unless special provisions are made (see .4 below).
- .5 Current *arboriculturally* theory and practice recognizes that trees grow in health and vitality in proportion to soil volume below the surface. Sub-standard soil conditions or limited soil

volumes under pavements can significantly reduce tree performance and longevity, cause premature damage to pavement and underground services, and have implications for public safety.

Consultants and project managers are strongly encouraged to plan, budget and design to optimize soil conditions for root systems under pavements. The primary methods most commonly recommended for increasing soil volume under pavements are:

- .1 Structural Soil: "...is a designed medium which can meet or exceed pavement design and installation requirements while remaining root penetrable and supportive of tree growth". (Cornell University, Urban Horticulture Institute)
- .2 Suspended Pavements and Structural Cells: "A modular, pre-engineered cell system ... to meet the needs of water management, soil and tree roots...[and] create large spaces under pavement...supported and protected from root damage by the cell structure."

The following references are suggested for further information and sample details:

- .1 Urban, James. Up by the Roots: Healthy Soils and Trees in the Built Environment. Champaign, Ill. : International society of Arboriculture, c2008.
- .2 Hopper, Leonard J., ed. Landscape Architectural Graphic Standards. Hoboken, N.J.: John Wiley & Sons, c2007. (see: Tree Planting in Urban Areas, p361)
- .3 Cornell Urban Horticulture Institute Structural Soil: An Innovative Medium Under Pavement that Improves Street Tree Vigor:
<http://www.hort.cornell.edu/uhi/outreach/csc/article.html>.

2.4 Coordination

- .1 Coordinate review of all planting designs and tree selections during design development phases with the UBCO Facilities Manager of Landscape and Building Services ensure congruence with UBC Okanagan Campus Plan Design Guidelines.
- .2 Coordinate review of planting designs and tree selections during design development phases with Campus Landscape Architect in conjunction with UBCO Facilities Manager of Landscape and Building Services as required to ensure plant selections and arrangements are congruent with current maintenance operations, institutional horticultural practices and resource scheduling.
- .3 Review any plant or tree substitutions during design or construction phases with UBCO Facilities Manager of Landscape and Building Services to ensure appropriateness as per 2.4.1 and 2.4.2 above.
- .4 Coordinate review of all planting designs requiring specialized care or technologies such as botanical collections, green roofs, living walls and bioengineered plantscapes during design development phases with Campus Landscape Architect in conjunction with UBCO Facilities Manager of Landscape and Building Services to ensure appropriateness as per 2.4.1, 2.4.2 and 2.4.3 above.

2.5 Delivery, Storage and Protection

- .1 All plant material is to be off-loaded, handled and moved on site so as to avoid dropping and sudden impacts to roots and rootballs.
- .2 Contractor to ensure all plant material is free of damages, defects, noxious perennial weeds and is true to type as specified on plant list. Sub-standard plant material or weed infested plant material shall not be accepted or installed by the contractor.
- .3 The contractor shall be responsible for the storage, protection and installation of all plant

- material.
- .4 Immediately store and protect plant material which will not be installed within 1 hour after arrival at site in storage location approved by UBCO Facilities Manager of Landscape and Building Services.
 - .1 Protect stored plant material from frost, wind, sun, drought and physical damage as follows:
 - .1 For bare root plant material, preserve moisture around roots by heeling-in or burying roots in hem/fir mulch or topsoil and watering to full depth of root zone.
 - .2 For pots and containers, maintain moisture level in containers. Heel-in fibre pots and all other containers as required for increasingly adverse weather conditions.
 - .3 For balled and burlapped and wire basket root balls, keep moist before planting by heeling-in with mulch or soil.
 - .4 Place all plants stored on site in such a way as to protect branches, rootballs and roots from damage.
 - .5 Verify existence and location of any on-site utilities. Contact the UBCO Facilities Manager of Landscape and Building Services immediately for directions as to procedure should any piping or utilities be encountered during excavation.
 - .6 Protect existing equipment, sidewalks, landscaping reference points, monuments and markers. Make good all damage incurred during this work.
 - .7 Make every effort to protect plants in storage adjacent to any construction work.
 - .8 Erect temporary continuous barriers, and/or tree protection fencing where necessary to ensure safety of existing plants and trees. Refer to Section 32 01 93.01 Tree and Shrub Preservation.
 - .9 Replace, at no expense to UBCO, any plant material damaged as a result of the work of this section.
 - .10 Protect fertilizers from moisture.
 - .11 Notify the Project Landscape Architect a minimum of forty-eight (48) hours prior to each delivery.

2.6 Warranty

- .1 Warranty should stipulate that plant material will remain free of defects as per contract plant lists and landscape specifications, for one (1) full year from the date of certified Substantial Performance of the Work.
- .2 End of warranty inspection will be conducted by the UBCO Facilities Manager of Landscape and Building Services.

2.7 Inspection

- .1 Make all trees and plant material available for inspection at one location well in advance of scheduled planting time. Notify the UBCO Facilities Manager of Landscape and Building Services when plants are available for inspection.
- .2 All plants are subject to inspection and may be rejected for failure to comply with contract

specifications at any time until Substantial Performance. Replace rejected material and remove from the site at no cost to UBCO.

- .3 Notify the UBCO Facilities Manager of Landscape and Building Services at the completion of work for an Inspection for Substantial Performance.
- .4 Final inspection of all planting will be made at the end of the specified warranty period. For release from the Contract, all plant materials supplied or transplanted must be alive and in a healthy, satisfactory growing condition at the time of inspection.
- .5 The UBCO Facilities Manager of Landscape and Building Services at his discretion may waive one or more inspections, but this shall not impair the right of the Project Landscape Architect to inspect work or materials which have been damaged or in any way do not conform to the contract specifications.
- .6 Contractor to be present during all required inspections as specified or as may be required by the UBCO Facilities Manager of Landscape and Building Services.

2.8 Replacements

- .1 Replace all plant material found dead, or not in a healthy, satisfactory growing condition or which, in any other way, do not meet the requirements of the project or contract specifications, at Contractor's expense, during and up to end of the warranty period.
- .2 The cost of replacements resulting from theft, accidental damage, vandalism, carelessness on the part of others shall not be borne by the Contractor.
- .3 All required replacements shall be plants of the same size and species as specified on the plant list and shall be supplied and planted in accordance with the drawings, specifications and change orders.
- .4 Replace defective or dead plants, trees, lawns or plantings as required during the 1 year maintenance and warrantee period to the satisfaction of the Project Landscape Architect and UBCO Facilities Manager of Landscape and Building Services.

2.9 Substitutions

- .1 If it is impossible to obtain the particular plant material listed on the Landscape Drawing, the Contractor may be permitted to suggest substitutions with types and variations possessing the same characteristics. The Contractor must request any substitutions of trees in writing at least three (3) months and shrubs and groundcover at least two (2) months prior to planting. Substitutions must be approved by the Project Landscape Architect in consultation with UBCO Facilities Manager of Landscape and Building Services.

2.10 Plant Material Identification

- .1 Plant material that has been located by the Project Landscape Architect and tagged for the project is to have the identification tags removed only after inspection and instruction by the Project Landscape Architect after delivery to the site.

2.11 Planting Time

- .1 Plant only during the season or seasons which are normal for such work determined by weather conditions and as approved by the Project Landscape Architect.
- .2 Do not plant during freezing and/or abnormally hot, dry weather.

2.12 Maintenance

- .1 Refer to Section 32 01 90 Operation and Maintenance of Planting for complete maintenance guidelines.
- .2 The maintenance period begins at the time each plant is planted and continues for 55 days from the date of Substantial Performance.
- .3 Maintenance includes necessary watering, cultivation, weeding, pruning, mowing, aerating, disease and insect control as required with organic pesticides, replacement of unacceptable material, straightening plants which lean or sag, adjustment of plants which settle or are planted too low, and any other procedures consistent with good horticultural practice necessary to insure normal, vigorous and healthy growth of all work under contract.
- .4 Maintain all accessories such as tree stakes, etc., in good condition including adjustment to keep tree stakes tight. Repair or replace all such accessories when required.

2.13 Area of Plant Supply and Search

- .1 Before substitutions of plant material are considered, documented due diligence that the specified material is not available at nurseries throughout Pacific Northwest (Canada and United States) must be provided. Area of supply shall include but shall not be limited to the area as mentioned herein.

2.14 Plant Material

- .1 Trees, shrubs, groundcovers, perennials etc., shall be nursery grown of sizes and quantities shown in plant lists on landscape drawings and specification.
- .2 Conform to the Canadian Landscape Standard and Canadian Standards for Nursery Stock. In particular:
 - .1 "Nursery stock shall be true to name, and of the size or grade stated."
 - .2 "Quality must be typical for the species when grown under proper cultural practices...viable, substantially free from pests and disease, and undamaged."
 - .3 "Between digging and delivery, roots must not be subject to long exposure to drying winds, sun, or frost, between digging and delivery."
 - .4 "Root balls and containers must be free from pernicious, perennial weeds."
 - .5 "All normal quality nursery stock must have an adequate fibrous root system that has been developed by proper cultivating practices, particularly transplantings or root pruning."
 - .6 "Plants must be grown in the container for a minimum of three months or have a well established root system reaching the sides of the container to maintain a firm ball."
- .3 Plant materials should be transplanted or root-pruned at the nursery at least once within the year prior to planting.
- .4 Take precautions during digging, handling and shipping of plant material to avoid injury to plant parts, branches and root systems.

- .5 Trees designated B&B 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. 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 with loose, broken, processed or manufactured root balls shall not be accepted.
- .6 Trees and plants designated as transplants, bareroot or collected plants, shall not be dug or installed before dormancy or after bud break.
- .7 All plants, typical of their species or variety, shall have a normal habit of growth and shall be first quality, sound, healthy, vigorous, well branched, and densely foliated, free of disease, insect pests, eggs or larvae, healthy well furnished root systems free of binding or girdling roots.
- .8 Plants must conform to the measurements specified in the plant list. Measurements specified are minimum size acceptable for each variety. Plants that meet the requirements specified in the plant list, but that do not possess a normal balance between height and spread will not be accepted. Plants for use when symmetry is required, or when planted in formal rows, shall be matched in form and size as nearly as possible. Do not prune prior to delivery.
- .9 All plants and all tree trunks shall be measured when the branches are in the normal position. Dimensions for height and spread as contained herein refer to the main body of the plant and not from branch-tip to branch-top. The height of tree trunks need not be as specified if the required height can be obtained by pruning the lower branches without leaving unsightly scars or otherwise damaging the trunk. Do not prune branches to obtain the required height, before the plants are delivered to the site unless so approved in writing by the UBCO Facilities Manager of Landscape and Building Services.
- .10 As per Canadian Standards for Nursery Stock: tree caliper must be the determining measurement when the caliper exceeds 40 mm (1.5 in.). It must be measured no less than 150 mm (6") above the ground level for trees with a caliper up to 100 mm (4"). Trees 100 mm (4in.) and larger caliper are to be measured 300 mm (12 in.) above the ground level.
- .11 All trees must have straight trunks with a single leader intact. Trees with multiple leaders, unless specified, shall be rejected. Trees with a damaged or crooked leader, bark abrasions, sunscald, disfiguring knots, insect or disease damage, girdling roots or cuts on limbs over 20mm (3/4") in diameter that are not completely closed should be rejected by UBCO Facilities Manager of Landscape and Building Services.
- .12 Take precautions during digging, handling and shipping of plant material to avoid injury to plants and root systems.

2.15 Related Materials:

- .1 Tree stakes: dressed 50mm (2") diameter treated fir stakes, lengths as detailed. Number per tree as required to keep tree plumb and true during one (1) year warranty period.
- .2 Guywires: Trees up to 65mm (2.5") calliper - 14 gauge galvanized, multi-strand, twisted wire. Trees 65mm (2.5") to 75mm (3") calliper – 12 gauge wire, covered with new black garden hose, 2-ply, reinforced and of at least 13 mm (1/2") diameter, around leader at branch crotch.
- .3 Deadmen: 100x150 mm (4"x6") pressure preservative treated construction grade lumber or approved equivalent. Lengths to be determined on site.
- .4 Plastic Strapping: DeepRoot, Arbortie or approved equivalent. Strapping to be to be 19mm (2") wide, flat, woven polypropylene or nylon; 900 lb. break strength.

- .5 Mulch: Shall be composted bark mulch with 50mm and minus Douglas Fir / Hemlock bark chips, dark brown in colour and free of cedar chips, soil, wood, stones, roots, plastic and other deleterious matter or pre-approved equal. Minimum compacted depth 7.5 cm (3").
- .6 Fasteners: All fasteners hot dipped galvanized.
- .7 Fertilizers: Agricultural fertilizer of a formula indicted by soil test results of site soils and/or planting media specified for the project. Fertilizers shall be organic, slow-release compositions incorporated into the planting media wherever applicable.
- .8 Anti-Desiccants: if specified, are to be applied to plants in full leaf immediately before digging or as required by the Project Landscape Architect. Anti-Desiccants are to be sprayed so that all leaves and branches are covered with a continuous protective film.
- .9 Biostimulants: shall contain soil conditioners, VAM, and ectomycorrhizal fungi spores and soil bacteria appropriate for existing soil conditions. Submit manufacturer's literature for approval.

2.16 Planting Hole Excavations – Trees, Shrubs and Groundcovers

- .1 Trees, shrub, and groundcover beds are to be excavated to the depth and widths indicated on the drawings. If the planting area under any tree is initially dug too deep, the soil added to bring it up to the correct level should be thoroughly tamped.
- .2 The sides of the excavation of all planting areas shall be sloped at a 45 degrees. The bottom of all beds shall slope parallel to the proposed grades or toward any subsurface drain lines within the planting bed. The bottom of the planting bed directly under any tree shall be horizontal and tamped such that the tree sits and remains plumb.
- .3 Maintain all required angles of repose of the adjacent materials as shown on the drawings. Do not excavate compacted subgrades of adjacent pavement or structures.
- .4 Subgrade soils shall be separated from the topsoil, removed from the area, and not used as backfill in any planted or lawn area. Excavations shall not be left uncovered or unprotected overnight.
- .5 On steep slopes, the depth of the excavation shall be measured at the center of the hole and the excavation dug as shown on the drawings.
- .6 Detrimental soil conditions: The landscape architect is to be notified, in writing, of soil conditions encountered, including poor drainage that the contractor considers detrimental to the growth of plant material. When detrimental conditions are uncovered, planting shall be discontinued until instructions to resolve the conditions are received from the UBCO Facilities Manager of Landscape and Building Services.
- .7 Obstructions: If rock, underground construction work, utilities, tree roots, or other obstructions are encountered in the excavation of planting areas, alternate locations for any planting shall be determined by the UBCO Facilities Manager of Landscape and Building Services.

2.17 Transplanting

- .1 Existing established trees, shrubs, and groundcovers designated to be relocated on site or from off-site locations, must be harvested, handled and transported according to recognized horticultural and arboricultural practices, and where applicable, within the guidelines and specifications applied to nursery stock as per the Canadian Standards for Nursery Stock, Canadian Landscape Standard and ANSI A300. Refer to Section 32 93 05 Relocation of Existing Plant Material, for comprehensive transplanting guidelines.

2.18 Planting Season

- .1 Plant only during the season or seasons which are normal for such work determined by weather conditions and as approved by the UBCO Facilities Manager of Landscape and Building Services.
- .2 Do not plant during freezing and/or abnormally hot, dry weather.

2.19 Plant Layout

- .1 Plants should be located according to landscape planting plan, and according to locations determined by the UBCO Facilities Manager of Landscape and Building Services. Contractor to coordinate approval by UBCO Facilities Manager of Landscape and Building Services of planting layout prior to planting. Within reason, the Project Landscape Architect may make adjustments in plant location and orientation prior to, during and after planting.
- .2 Position of trees to be planted within structural cells should be determined prior to positioning and installing of structural cells.
- .3 Location of all major trees should be accurately staked on site. Call the UBCO Facilities Manager of Landscape and Building Services to be present during planting of major trees to ensure proper orientation and location.

2.20 Planting Procedures

- .1 All plants to be installed maintaining original grades of bases as they were in the Nursery.
- .2 Loosen bottom of planting hole to depth of 150-200mm (6 - 8") prior to placing growing medium.
- .3 Plant bare root trees vertically with roots placed straight out in hole. Orient plant material to give best appearance in relation to structure, roads and walks.
- .4 Place plant material to depths equal to the depth they were originally growing in nursery.
- .5 With balled and burlapped root balls, loosen burlap and cut away minimum top 1/3 without disturbing root ball. Do not remove burlap or rope from under root ball. Remove any excess soil on top of root ball such that root flare is at or slightly above finished grade.
- .6 With container stock, remove entire container without disturbing root ball. Non bio-degradable wrappings must be removed.
- .7 Tamp growing medium around root system in layers of 150mm (6") eliminating air voids. Frozen or saturated growing mediums unacceptable. When 2/3 of growing medium has been placed, fill hole with water. After water has completely penetrated into soil, complete backfilling.
- .8 Water thoroughly on the interior of the tree saucer until it is filled even if it is raining. A second watering may be necessary to ensure saturation of the root ball.
- .9 Prune out any dead or broken branches.
- .10 Remove all tags, labels strings, etc. from plant material.

2.21 Fertilizer Application and Soil Amendments

- .1 Make all amendments of lime and fertilizer indicated by soil test results at time of mixing and

prior to placement of plant material. All mixing shall take place using appropriate equipment and methodology so as to ensure thorough mixing of all components within the planting media. (Refer to Section 32 91 00 Planting Preparation)

- .2 Pursuant to soil test recommendations and/or recommendations of the Project landscape Architect, add composted organic matter amendment as follows: After specified topsoil or planting mix is installed, and prior to fine grading and installation of plantings, spread 100 (4 in.) of composted organic matter over all beds and rototill into the top 100 mm (4 In.) of planting mix or topsoil. (Refer to Section 32 91 00 Planting Preparation).

2.22 Mulching

- .1 Mulch all tree, shrub and groundcover planting areas to a 7.5 cm (3") compacted depth with composted bark (see **2.15.5** above).
- .2 Ensure soil settlement has been corrected prior to mulching.

2.23 Guying and Staking

- .1 Guy and stake all trees immediately after planting according to current recommendations of the International Society of Arboriculture (ISA) and the ANSI A300 – Standards for Tree Care Operations. Plant material not guyed or staked immediately shall be replaced if damaged.
- .2 Stake or guy a tree only when necessary for the specific conditions encountered and as per ISA Tree Staking Details or project drawing details. Staking may be required in unusual circumstances such as sandy soils or in extremely windy conditions, Poor quality trees with cracked, wet, or loose root balls, poorly developed trunk-to-crown ratios, or undersized root balls shall be rejected if they require staking, unless written approval to permit staking or guying as remedial treatment is obtained from the UBCO Facilities Manager of Landscape and Building Services. Trees that settle out of plumb due to inadequate soil compaction either under or adjacent to the root ball shall be excavated and reset. In no case shall trees that have settled out of plumb be pulled upright using guy wires.
- .3 Stakes, anchors wires or plastic strapping shall be of sufficient strength to maintain the tree on an upright positions that overcomes the particular circumstances that initiated the need for staking or guying.
- .4 Guying: Fasten tree around leader at branch crotch to stake, pin or deadman in the ground, or laterally to upright tree stake with galvanized wire protected by hose where wire wraps around leader and crotch as per manufacture's or drawing detail specifications. Alternate to wire use Deeprout, Arbortie plastic strapping or approved equivalent.
- .5 Trees to stand plumb upon completion of this operation.
- .6 Stakes and guys shall be removed at end of first growing season. Any tree that is not stable at the end of this period shall be rejected.

2.24 Maintenance Prior to Substantial Performance

- .1 Maintain all plant material from date of planting until Certificate of Substantial Performance. Refer to Section 32 01 90 Operation and Maintenance of Planting.
- .2 Program timing of operations in accordance with growth, weather conditions and use of site.
- .3 Complete each operation within a reasonable time period prior to proceeding.
- .4 Collect and dispose of debris or excess material on a daily basis.

- .5 Water to maintain soil moisture conditions for optimum establishment, growth and health of plant material without causing erosion.
- .6 Supply equipment such as pumps, portable sprinklers systems, tanker trucks, hose and sprinklers required for watering operations.
- .7 The use of toxic chemical pesticides for cosmetic purposes is voluntarily suspended on UBC Campus. Plant only disease resistant and disease free stock. Remove and replace significantly infected plants. Combat pests, diseases and weeds according to IPM principles and within the limits of UBC Pest Control Policy #12. Cultivate to control weeds. Apply only organic, non-toxic pesticides as a last resort. Any use of pesticides on UBCO Campus must be approved and/or coordinated in consultation with UBCO Facilities Manager of Landscape and Building Services. Do not use pesticides prohibited by Agriculture Canada or the Pesticide Control Act Regulation.
- .8 Cultivate whenever required to keep top layer of soil loose, friable and free from weeds. Any operation must be continuous without interruption.
- .9 Replace or respread damaged, missing or disturbed mulch.
- .10 Clean, by hand, areas that are covered with mulch. Loosen top layer of mulch without mixing it with soil underneath.
- .11 Remove weeds including their roots.
- .12 Remove, dispose off Campus, and replace any plants and soil overwhelmed with persistent, noxious, invasive or perennial weeds.
- .13 Remove dead or broken branches from plant material. Prune in accordance with Division 32.
- .14 Keep trunk protection and guy wires in proper repair and adjustment.
- .15 Remove and replace dead plants and plants not in healthy growing condition. Make replacements in same manner as specified for original plantings.

2.25 Acceptance

- .1 Plant material will be accepted by Project Landscape Architect and UBCO Facilities Manager of Landscape and Building Services upon Substantial Performance of the Work and again at the end of the warranty period, provided that trees, plant material and plantings exhibit healthy growing conditions and are free from annual/perennial/invasive/noxious weeds, disease, insects and fungal organisms.
- .2 Acceptance will not be forthcoming if tree plants, plantings and/or soil show any evidence of invasive or perennial weeds such as morning glory, creeping vetch, horsetail or couch grass.
- .3 Plant material insufficiently hardened-off prior to onset of frost and freeze may be rejected and require replacement if signs of frost damage, poor root development or winter desiccation are evidenced.

2.26 Maintenance During Warranty Period

- .1 Refer to Section 32 01 90 Operation and Maintenance of Planting.

END OF SECTION