7.3.14 If the landscape drawings include naturalized grass, these areas will be vigorous, healthy, and naturalized by FAC inspection. Mowing may be completed only to establish plant health and must maintain a minimum height of 100-150 mm during establishment. During grass seed establishment do not cut more than 1/3 of blade height or below 100 mm (whichever is taller) at any one mowing.

7.3.15 Grass slopes greater than 3:1 will be naturalized and not mowed regularly. Newly constructed slopes should be seeded with a naturalized or native seed mix. Reference Specification 2920 Seed and Sod, 2.1.3. Native and Naturalization Seed Mixes.

7.4 Designated Roadway Tree Planting Corridors

7.4.1 Collector and arterial roadways must incorporate a utility-free planting corridor within boulevards and medians to accommodate planting requirements with appropriate setbacks. If trees are on the plan and cannot be planted due to utility or access conflicts, these trees should be planted where possible within the same stage of development.

7.5 Tree Setbacks from Utilities and Property Lines

7.5.1 Where possible, trees shall be setback a minimum distance, measured from the center of the tree trunk, from above and below grade utilities and property lines as follows:

Tree Setbacks from Utilities and Property Lines	
Distance from Light Standards/ Power Hardware	3.5m
Distance from Fire Hydrants	3.5m
Distance from Stop Signs	3.5m
Distance from Yield Signs	3.5m
Distance from Transit Zones	3.5m*
Distance from Other Signs	2.0m
Distance from Private Property on Walkway R.O.W.	1.0m
Distance from Private Property on Open Parkland	3.0m
Distance from Private Property on Boulevards	1.0m
Distance from Shallow Underground Utilities	1.0m
Distance from Gas or Oil R.O.W.	Contact Utility
Distance from Deep Underground Utilities	1.5m
Distance from Sanitary and Storm Sewers	1.8m
Distance to Sanitary and Storm Sewers and Manholes	2.0m
Distance from Water Mains	2.5m
*Ensure trees do not create sightline obstructions for vehicles approaching transit zones.	
Note: Distances from overhead power utilities shall be as per the requirements established by the Utility Authority.	

7.6 Tree Setbacks from Walkways and Roads

7.6.1 Where possible, trees shall be setback a minimum distance, measured from center of the tree trunk, to walkway and roads as follows:

Local Residential	
Face of Curb	1.25m
Face of Curb (Boulevard Without Sidewalk)	2.0m
Collector Residential or Local Industrial (Roadway Width less than 14.5m)	
20m R.O.W.	
Face of Curb	1.25m
R.O.W. greater than 20m	
Face of Curb	1.65m
14.5m Industrial or Local Collector	
Face of Curb	1.65m
Arterial Roadway	
Face of Curb	2.0m*
Hardsurface	
Edge of Commercial or Industrial Accesses	1.5m
Edge of Residential Driveways	1.0m
Edge of Sidewalk	1.0m
* Distances less than indicated above, are at the discretion of the Director/Parks in consultation with Transportation.	
Note: Setback distances apply to both Boulevards and Medians.	

7.6.2 There shall be no mulched beds within 2.5m of curb on boulevards along arterial and collector roadways.

7.7 Tree and Shrub Planting Setbacks and Spacing

7.7.1 Where possible, it is suggested that landscape improvements and plant materials have increased setbacks from underground utilities.

7.7.2 There shall be no excavations undertaken within 1.0m of any underground utility cables unless:

- The excavation is done under the control of the operator of the utility system.
- The excavation method is acceptable.

7.7.3 In the event that the mechanical tree digging equipment cannot maintain a minimum clearance of 1.0m from shallow utilities during installation, the pertinent Utility Authority must be contacted for approval and/or safety procedures (e.g. hand digging). Any additional costs incurred will be at the Developer's expense. Drawings are to note that the approval for plantings have been received from the Utility Authority, and identify the plant materials/areas affected. It should be noted that deep utilities require a minimum offset as referenced in Section 7.5 Tree Setbacks from Utilities and Property Lines.

7.7.4 Planting distances from low, intermediate and high-pressure pipelines are to be observed as dictated by the Pipeline Authority.

7.8 Tree and Shrub Minimum Sizes

7.8.1 Unless noted otherwise or approved by the Director/ Parks, all planting shall be a minimum of 50mm caliper for deciduous trees and 2.0m height for Coniferous trees. A tree mix of deciduous and coniferous is generally encouraged where practical.

7.8.2 If proposed trees are less than the minimum caliper, additional plant material may be required, at the discretion of the City.

7.8.3 80mm caliper and larger trees will be accepted in boulevards if tree root trenching is proposed, and if there are no conflicts with utilities. A one year warranty period from CCC to FAC will apply in this case. Milestone inspections for tree root trenching will be required during trenching excavation. The consultant is to request an inspection with Forestry five business days prior to tree root trenching. If tree root trenching in boulevards is not proposed for trees 80mm caliper and larger, then a two year warranty period from CCC to FAC will apply. The City reserves the right to evaluate this standard on a case-by-case basis.

7.8.4 Coniferous trees up to the height of 3.6m will be permitted with an appropriate root ball specified in the current edition of The City of Edmonton Design and Construction Standards. All proposed trees planted with a tree spade will need to follow the current Specification 02930 Trees, Shrubs and Ground Covers, ball sizes for coniferous trees item 3.4.5, and will be treated as a transplant.

7.8.5 Minimum shrub spacing shall be based on spread at maturity. With the exception of naturalization areas, shrub size at planting shall be a minimum of 300mm height for deciduous shrubs and a spread of 450mm for coniferous shrubs. Reference Specification 02930 Trees, Shrubs and Ground Covers.

7.9 Required Planting Quantities for Open Spaces

7.9.1 The following tree quantities are outlined in the Urban Parks Management Plan (UPMP) as the minimum requirements for base level development. The total area of parkland, minus retained tree stand areas, shall be used to calculate planting requirements. Credit for individual retained specimen trees may be considered by the Director/Parks.

- River Valley and Ravine Parks (where planting is required): 70 trees/ha.
- District Activity Parks: 45 trees/ha.
- Pocket Parks: 70 trees/ha.
- Urban Village Parks: 65 trees/ha.
- School and Park Sites: 55 trees/ha.
- Greenways: 200 trees/ha (Note: this has been reduced from 240 trees/ha as specified in UPMP) assuming 10m width and 2 trees/10 lineal meters; (UPMP specifies 8-10m spacing).
- 70 trees/ha is required for other parkland not identified above.

7.9.2 Seven shrubs can be substituted for one tree, to a maximum of 10% of the total number of required trees for each site, at the discretion of Parks.

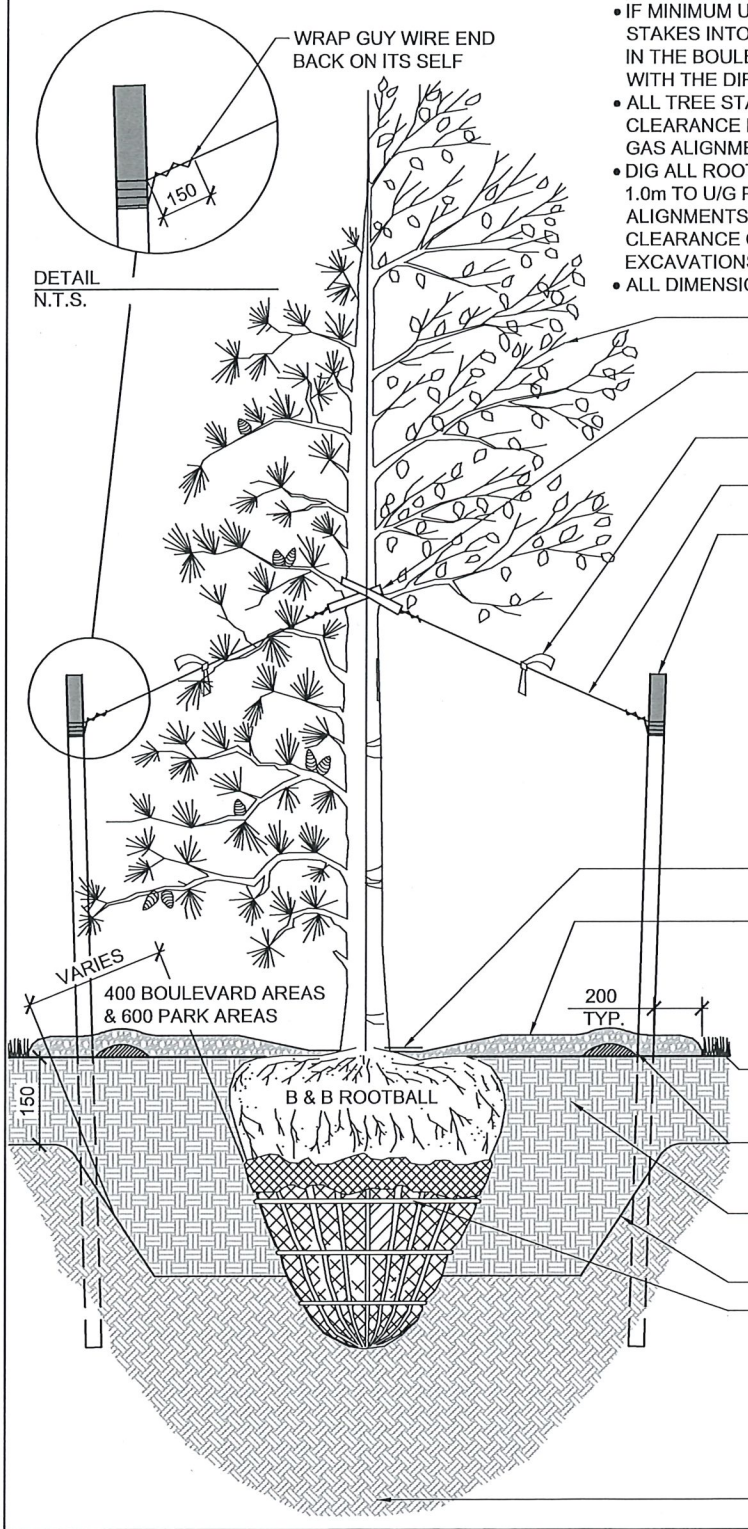
Deciduous Trees			Code					
Botanical Name	**Common Name**	**Spacing**	**S**	**St**	**P**	**Pt**	**Ec**	**La**
Tilia americana	American Linden	8 m	S		P			
Tilia americana 'Duros'	True North Linden	8 m	S		P			La
Tilia americana 'Redmond'	Redmond Linden	8 m	S		P			La
Tilia cordata	Littleleaf Linden	8 m	S		P			
Tilia cordata'Greenspire'	Greenspire Littleleaf Linden	8 m	S		P			La
Tilia cordata 'Corzam'	Corinthian Linden	8 m	S		P			La
Tilia x flavescens 'Dropmore'	Dropmore Linden	8 m	S		P			
Ulmus americana	American Elm	10 m	S		P			
Ulmus americana 'Brandon'	Brandon Elm	8 m	S		P			
Ulmus americana 'Patmore'	Patmore Elm	8 m	S		P			La
Ulmus pumila	Siberian Elm	10 m	S		P			

Coniferous Trees			Code					
Botanical Name	**Common Name**	**Spacing**	**S**	**St**	**P**	**Pt**	**Ec**	**La**
Abies balsamea	Balsam Fir	4 m				Pt		La
Abies concolor	White Fir	4 m				Pt		La
Juniperus scopulorum 'Wichita Blue'	Wichita Blue Upright Juniper	4 m				Pt		La
Juniperus scopulorum 'Moonglow'	Moonglow Upright Juniper	4 m				Pt		La
Juniperus scopulorum 'Medora'	Medora Upright Juniper	4 m				Pt		La
Juniperus virginiana 'Blue Arrow'	Blue Arrow Upright Juniper	4 m				Pt		La
Juniperus virginiana 'Skyrocket'	Skyrocket Upright Juniper	4 m				Pt		La
Larix sibirica	Siberian Larch	8 m			P			
Larix laricina	Tamarack	8 m			P			
Picea abies	Norway Spruce	8 m			P			
Picea engelmannii	Engleman Spruce	8 m			P			
Picea glauca	White Spruce	8 m			P			
Picea glauca var. densata	Black Hills Spruce	8 m			P			
Picea mariana	Black Spruce	8 m			P		Ec	
Picea omorika 'Bruns'	Bruns Serbian Spruce	8 m			P		Ec	La
Picea pungens 'Fastigiata'	Columnar Colorado Spruce	3 m			P			
Picea pungens	Colorado Green Spruce	8 m			P			
Picea pungens var. glauca	Colorado Blue Spruce	8 m			P			
Pinus aristata	Bristlecone Pine	4 m				Pt		La
Pinus banksiana	Jack Pine	4 m			P			
Pinus cembra	Swiss Stone Pine	4 m			P			La
Pinus contorta var. latifolia	Lodgepole Pine	4 m			P			
Pinus flexilis	Limber Pine	4 m				Pt		
Pinus mugo subspecies uncinata	Mountain Pine	8 m				Pt		
Pinus nigra	Austrian Pine	8 m			P			La
Pinus ponderosa	Ponderosa Pine	10 m			P			
Pinus strobus	Eastern White Pine	8 m			P			La
Pinus strobus fastigiata	Columnar Eastern White Pine	4 m			P			La

Coniferous Trees			Code					
Botanical Name	**Common Name**	**Spacing**	**S**	**St**	**P**	**Pt**	**Ec**	**La**
Pinus sylvestris	Scots Pine	8 m			P			
Pseudotsuga menziesii	Douglas Fir	8 m			P			
Thuja 'Brandon'	Brandon Pyrimidal Cedar	4 m			P			
Thuja 'Skybound'	Skybound Pyrimidal Cedar	4 m			P			
Thuja 'Degroots Spire'	Degroots Spire Pyrimidal Cedar	4 m			P			

CONIFEROUS
Less than 3.0m ht.

DECIDUOUS
Less than 100mm cal.



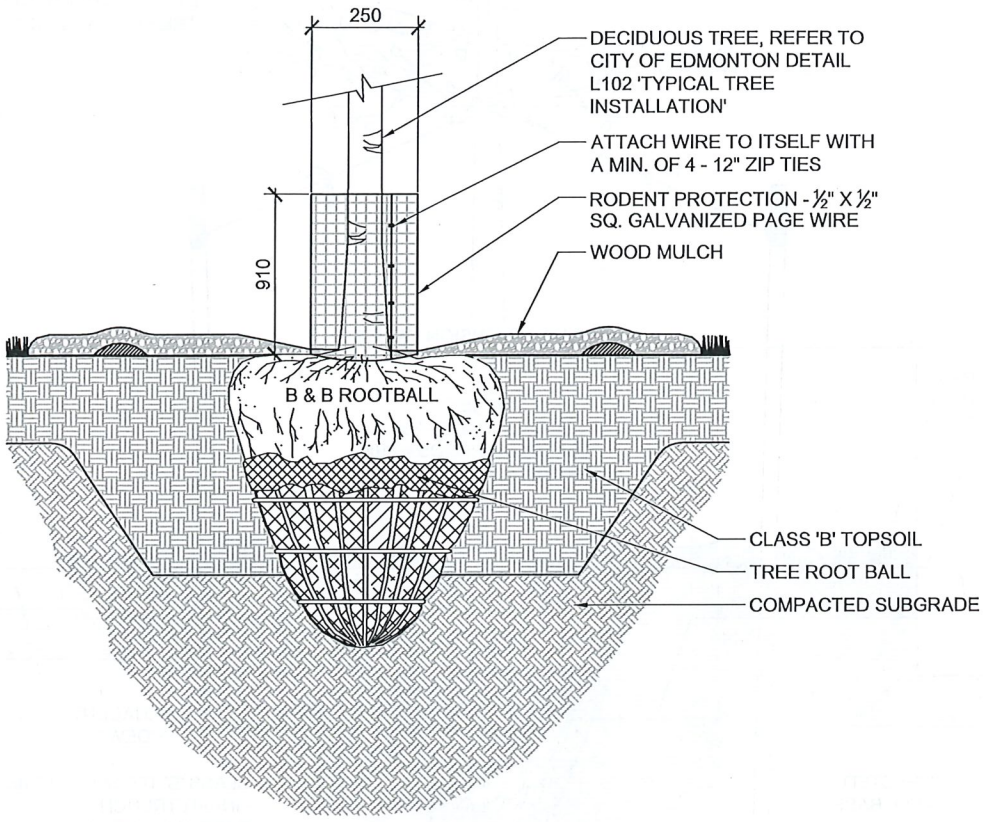
NOTES:

- ALL COMPONENTS AND WORKMANSHIP TO CONFORM TO SPECIFICATION SECTION 02930 TREES, SHRUBS AND GROUNDCOVERS AS WELL AS THE RELATED SECTIONS.
- IF MINIMUM UTILITY SETBACKS PERMIT POSITION TREE STAKES INTO DIRECTION OF PREVAILING WINDS OR IF IN THE BOULEVARD THE STAKES SHOULD BE IN LINE WITH THE DIRECTION OF TRAFFIC.
- ALL TREE STAKES TO MAINTAIN MINIMUM 1.0m CLEARANCE FROM ALL U/G POWER, TELEPHONE AND GAS ALIGNMENTS.
- DIG ALL ROOT HOLES BY HAND WHEN CLOSER THAN 1.0m TO U/G POWER, TELEPHONE AND GAS ALIGNMENTS (REFER TO SECTION 7.6.2 AND 7.6.3 WHEN CLEARANCE CANNOT BE MAINTAINED FOR ANY EXCAVATIONS).
- ALL DIMENSIONS IN MILLIMETERS.

THE CITY OF Edmonton

TYPICAL TREE INSTALLATION

Date Approved:	Drawn By:	Approved:	Revision	Drawing No.
JUNE 2016	PARKS PLANNING	M.C.		LA102
Scale:	Checked By:			Old Drawing No.
N.T.S.	PARKS PLANNING			SP400a



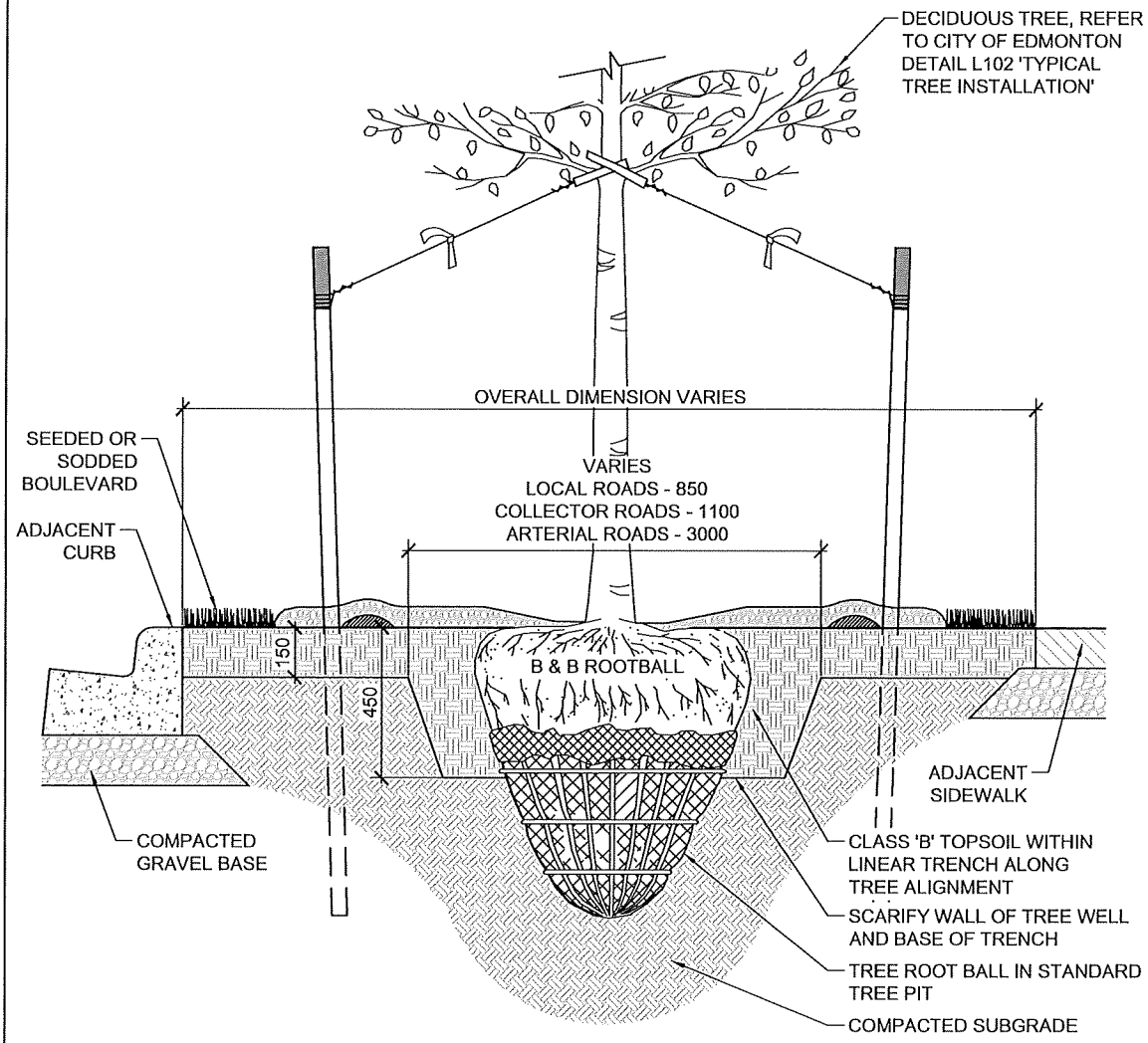
NOTES:

- ALL COMPONENTS AND WORKMANSHIP TO CONFORM TO SPECIFICATION SECTION 02930 TREES, SHRUBS AND GROUNDCOVERS AS WELL AS THE RELATED SECTIONS.
- IF MINIMUM UTILITY SETBACKS PERMIT POSITION TREE STAKES INTO DIRECTION OF PREVAILING WINDS.
- DIG ALL ROOT HOLES BY HAND WHEN CLOSER THAN 1.0m TO U/G POWER, TELEPHONE AND GAS ALIGNMENTS (REFER TO SECTION 7.6.2 AND 7.6.3 WHEN CLEARANCE CANNOT BE MAINTAINED FOR ANY EXCAVATIONS).
- ENSURE RODENT PROTECTION IS INSTALLED TO TOP OF ROOT BALL BELOW ANY WOOD MULCH.
- ALL DIMENSIONS IN MILLIMETERS.
- ALL OTHER MATERIALS WILL NOT BE ACCEPTED.
- THE CITY WILL REMOVE RODENT PROTECTION FROM THE TREE AFTER FAC AT FORESTRY'S DISCRETION.

THE CITY OF Edmonton

TYPICAL TREE RODENT PROTECTION

Date Approved:	Drawn By:	Approved:	Revision	Drawing No.
JUNE 2015	PARKS PLANNING	Frank Gasparik		LA112
Scale:	Checked By:			Old Drawing No.
N.T.S.	PARKS PLANNING			N/A



NOTES:

- ALL COMPONENTS AND WORKMANSHIP TO CONFORM TO SPECIFICATION SECTION 02931 NATURALIZATION AS WELL AS THE RELATED SECTIONS.
- ALL TREE STAKES TO MAINTAIN MINIMUM 1.0m CLEARANCE FROM ALL U/G POWER, TELEPHONE AND GAS ALIGNMENTS.
- IF MINIMUM UTILITY SETBACKS PERMIT POSITION TREE STAKES INTO DIRECTION OF PREVAILING WINDS OR IF IN THE BOULEVARD THE STAKES SHOULD BE IN LINE WITH THE DIRECTION OF TRAFFIC.
- DIG ALL ROOT HOLES BY HAND WHEN CLOSER THAN 1.0m TO U/G POWER, TELEPHONE AND GAS ALIGNMENTS (REFER TO SECTION 7.6.2 AND 7.6.3 WHEN CLEARANCE CANNOT BE MAINTAINED FOR ANY EXCAVATIONS).
- ALL DIMENSIONS IN MILLIMETERS.

THE CITY OF Edmonton

TYPICAL TREE ROOT TRENCH

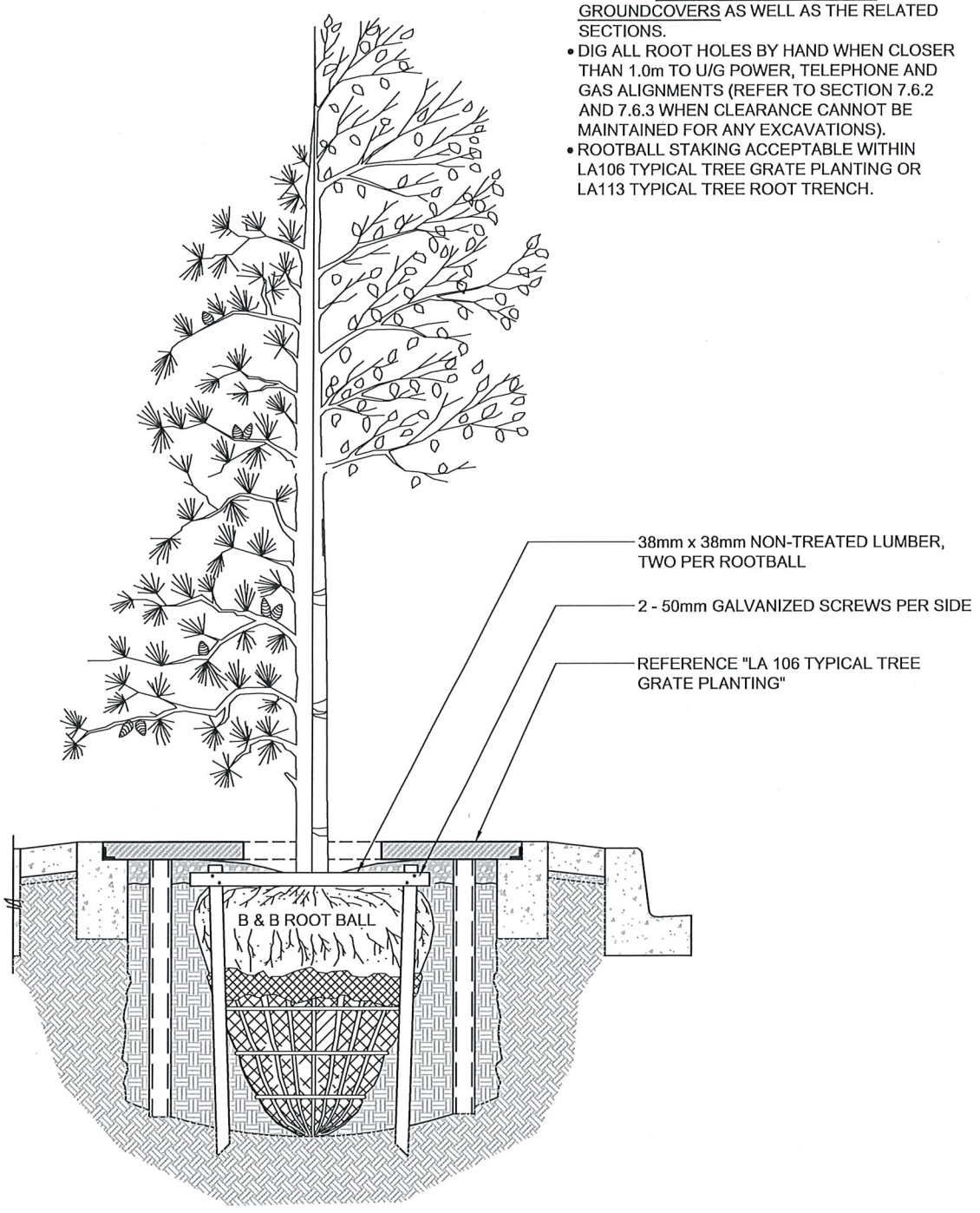
Date Approved:	Drawn By:	Approved:	Revision	Drawing No.
JUNE 2015	PARKS PLANNING	Frank Gagparik		LA113
Scale:	Checked By:			Old Drawing No.
N.T.S.	PARKS PLANNING			N/A

CONIFEROUS
Less than 3.0m ht.

DECIDUOUS
Less than 100mm cal.

NOTES:

- SPECIFICATIONS: ALL COMPONENTS AND WORKMANSHIP CONFORM TO SPECIFICATION SECTION 02930 TREES, SHRUBS AND GROUNDCOVERS AS WELL AS THE RELATED SECTIONS.
- DIG ALL ROOT HOLES BY HAND WHEN CLOSER THAN 1.0m TO U/G POWER, TELEPHONE AND GAS ALIGNMENTS (REFER TO SECTION 7.6.2 AND 7.6.3 WHEN CLEARANCE CANNOT BE MAINTAINED FOR ANY EXCAVATIONS).
- ROOTBALL STAKING ACCEPTABLE WITHIN LA106 TYPICAL TREE GRATE PLANTING OR LA113 TYPICAL TREE ROOT TRENCH.



THE CITY OF Edmonton

TYPICAL TREE ROOTBALL STAKING

Date Approved:	Drawn By:	Approved:	Revision	Drawing No.
JUNE 2017	PARKS PLANNING	M.C.		LA114
Scale:	Checked By:			Old Drawing No.
N.T.S.	PARKS PLANNING			N/A

1. GENERAL

1.1. SCOPE

Supplying materials, wood chip mulch, bark chip mulch, maintenance and inspections.

1.2. RELATED SECTIONS

Trees, Shrubs and Ground Covers Section 02930

1.3. PRODUCT DELIVERY, HANDLING and STORAGE

1.3.1. Supply mulch as specified on approved landscape drawings and specifications.

1.3.2. Protect mulch stockpile on site from contamination of airborne herbicides, pesticides, fertilizers and other hazardous chemicals.

1.3.3. Avoid the placement of mulches in excessively wet conditions or when the ground is frozen.

1.3.4. All organic mulches shall be generally free of diseases, moulds, fungi and insect infestations.

1.3.5. All organic mulches shall be free of inorganic materials such as metal, glass, rock and other foreign materials.

1.4. SUBSTITUTION

All mulches shall be supplied and installed as specified. Substitutions will not be allowed unless approved by the City.

1.5. INSPECTION

The City will inspect all mulches prior to installation. The Contractor must provide a mulch sample to the City for approval prior to site installations.

2. PRODUCTS

2.1. BARK WOOD MULCH

Mature bark of coniferous trees, cedar, pine, redwood, fir chipped to sizes ranging from 40 mm to 60 mm.

2.2. CONIFEROUS WOOD CHIP MULCH

Chipped trees, mulch containing bark, wood and needles. Maximum chipped sizes 50 mm to 100 mm. Free of non-organic materials, wood preservatives or diseased wood. For use on trails or pathways, picnic sites as surface cover and on planting beds containing acid loving plants such as azaleas, conifers and rhododendrons. Coniferous wood chip mulch is NOT for use in shrub beds, except as designated in this paragraph.

2.3. DECIDOUS WOOD CHIP MULCH

Chipped ash, elm, maple, poplar, birch and other deciduous trees. Mulch containing bark, wood and leaves (in summer) chipped to sizes ranging from 50 mm to 100 mm. Mulch may contain stringy twigs and seed, free of non-organic material, wood preservatives or diseased wood. Contains no more than 5% of the following materials in total: soil, sawdust, peat moss, coniferous wood and needles.

2.4. SOFTWOOD LUMBER CHIPS

Lumber, pallets and shingles chipped to a maximum size of 100 mm long x 5 mm thick & 40 mm wide. Free of all chemicals such as wood preservatives, paints, glues etc. Free of foreign materials such as nails, bolts, drywall or other refuse. No more than 5% soil and or sawdust.

2.5. PROHIBITED MULCHES

The following mulches are prohibited: rock, gravel, stone, shale, sawdust, shavings, peat moss, manures or raw composts, paper products, plastics, rubbers, aluminium foils, gelatinous sprays, plywoods and other lumbers containing chemical adhesives or wood preservatives.

3. EXECUTION

3.1. INSTALLATION

3.1.1. Include statement that 100 mm depth of deciduous wood chip mulch must be maintained to edge of planting bed.

3.1.2. All mulches to be installed during active growing season. Water plants prior to applying mulch.

3.1.3. During application all mulches shall be kept at least 50 mm to 75 mm away from tree trunks and shrubs.

3.2. PREPARATION

3.2.1. Remove all weeds and debris from area of installation.

3.2.2. A weed liner shall accompany organic mulches when designated on the Contract drawings.

3.3. SPREADING

3.3.1. Apply bark chip mulch in a 50 mm to 100 mm maximum layer in special areas as per drawings.

3.3.2. Apply coniferous wood chip mulch in acid tolerant planting beds to a minimum depth of 100 mm, except around tree trunks where chips are to be pulled back, leaving only a 25 mm depth.

3.3.3. Apply deciduous wood chip mulch to a minimum depth of 100 mm.

3.3.4. Apply softwood lumber chips in maximum layers of 50 mm to 100 mm.

3.4. CLEAN-UP

Clean roadway, walkway and surrounding turf of mulches and other debris caused by work under this Section at the end of each working day or as directed by the City.

3.5. MAINTENANCE

Spot control of weeds and seedling growth twice per year or as may be necessary. All mulched areas to be weed free during Construction Completion Certificate and Final Acceptance Certificate inspections

END OF SECTION

1. GENERAL

1.1 All "T" or "U" bar tree stakes will have the top 300 mm painted the appropriate colour code according to year planted. Colour coding of tree stakes is required for all trees to be maintained by Community Services.

YEAR	COLOUR
2012	Blue
2013	White
2014	Yellow
2015	Green
2016	Blue
2017	White
2018	Yellow
2019	Green
2020	Blue
2021	White
2022	Yellow

END OF SECTION

1. GENERAL

1.1 SCOPE

Supplying trees, shrubs, ground covers, fertilizing, watering, mulching, staking, maintenance and inspection.

1.2 RELATED SECTIONS

Topsoil Section 02910

1.3 EXAMINATION

1.3.1 Report to the City, in writing, any conditions or defects encountered on the site during construction upon which the work of this section depends and which may adversely affect its performance.

1.3.2 Do not commence work until such conditions or defects have been investigated and corrected.

1.3.3 Commencement of work shall imply acceptance of surfaces and conditions and no claims for damages or extras resulting from such conditions or defects will be accepted thereafter, except in cases where such conditions cannot be known prior to or during the course of construction.

1.4 PRODUCT DELIVERY HANDLING AND STORAGE

1.4.1 Supply manufactured items such as fertilizer and mulch, in standard containers, clearly indicating contents, weight, component analysis and the name of the manufacturer.

1.4.2 Store manufactured materials subject to deterioration, in a weatherproof place on site and in such a manner that their effectiveness is not impaired.

1.4.3 Supply plant material as specified on the plant list outlined on the approved landscape drawings.

1.4.4 Handle plant material with reasonable care and skill to prevent injuries to trunk, branches, roots, rootballs and containers.

1.4.5 Protect plants during shipment with tarpaulin or other suitable covering and carefully tie in all branches before transporting, to prevent excessive drying from sun and wind or breakage from wind and equipment. Pad all points of contact between plant material and equipment.

1.4.6 For trees dug by tree spade the root ball shall be placed in burlap and a wire basket. Wire basket shall be laced at the top and of sufficient strength to withstand lifting the tree by the top loops of the basket at a minimum of two points.

1.4.7 Trees (in foliage) that are moved by the Basket Method or Balled and Burlapped Method; the foliage and root ball must be covered by a tarp.

1.4.8 Container stock should be handled as much as possible by the pot only, in order to reduce breakage.

1.4.9 All plants should be unloaded and checked immediately upon arrival and should be watered as required. Trees with cracked or broken root balls will not be accepted.

1.4.10 Upon arrival all plant material that cannot be planted during the current day's operations shall be heeled with topsoil or mulch and watered. All plant material should be planted within 24 hours of delivery to site.

1.4.11 Root balls, roots, trunks, branches and leaves shall be protected on site from drying, frost, construction equipment, or other damage and be kept moist until planted.

1.4.12 Replacement of all damaged stock is at the Contractor's expense.

1.4.13 Subgrade material from the digging of tree pits by a tree spade is to be removed from the site at the Contractor's expense if it cannot be utilized on site.

1.5 SUBSTITUTION

1.5.1 All substitutions shall be made through a change order to the contract.

1.5.2 All requests for substitutions shall be vetted through the Landscape Architect responsible for preparing the contract drawings. Such request shall be forwarded to the City for approval.

1.5.3 Requests for substitution of plants larger than specified may require submission of revised contract drawings by the Landscape Architect for approval by the City.

1.6 INSPECTION

Prior to the commencement of installation plant materials may be inspected and approved either at the source of local supply or on site at the discretion of the City. Previous joint approval will not impair the right of the City during the course of construction to reject plants which have been damaged or which, in any way, do not conform to the specifications. Any rejected plant materials will be noted on a site instruction form and presented to the contractor for follow-up. The consultant must request inspection with Forestry five business days prior to tree root trenching. A Forestry delegate must inspect the trenching process prior to completion of the trenching project with approved top soil.

2. PRODUCTS

2.1 PLANT MATERIAL

2.1.1 All plant materials shall meet the horticultural standards of and comply with, all sections of the latest edition of Canadian Nursery Landscape Association (C.N.L.A.) planting specifications.

2.1.2 They shall be nursery grown, under proper cultural practices as recommended by the C.N.L.A.

2.1.3 Any plants dug from native stands, wood lots, orchards, or neglected nurseries and have not received proper cultural maintenance as advocated by the C.N.L.A., shall be designated as "collected plants".

2.1.4 The use of "collected" plants will not be permitted unless previously inspected and approved in writing by the City.

2.1.5 Within reason, plants shall be generally true to type and structurally sound, well branched, healthy and vigorous and free of disease, insect infestations, insect eggs, rodent damage, sunscald, frost cracks and mechanical wounds. They shall be densely foliated when in leaf and have a healthy, well-developed root system. Pruning cuts shall show vigorous bark on all edges and all parts shall be moist and show live, green cambium tissue when cut.

2.1.6 Trees shall have straight trunks with a well-developed single (or central) leader. Minor adjustments of structural integrity may be attempted by structural pruning carried out by or directly supervised by a certified professional (ISA Certified Arborist, Landscape Industry Certified Technician, Landscape Horticulturist (Red Seal or LGAP) or equivalent designation and will be subject to re-inspection. Clump or multi-stem trees shall have three or more stems originating from a common base.

2.1.7 Shrubs shall have natural form typical of the species with a minimum of four canes.

2.1.8 Vines shall have at least four runners, each of a minimum length of 300 mm.

2.1.9 Ground covers shall have well-developed tops, size proportionate to the developed roots typical of the species.

2.1.10 Annual plants to be of vigorous growth with healthy leaf and stem tissue and without sign of wilting. All plants to be full-form without missing or broken branches and of a shape typical of the particular species.

2.1.11 Plants that have been top-worked, sheared, or colour treated are not acceptable.

2.1.12 All plant materials shall conform to the measurements specified on the plant list on the approved landscape drawings except that plants larger than specified may be used if approved by the City. If larger plants are used, the root ball shall be increased in proportion to the size of the plant as per Section 02930 – Trees, Shrubs and Ground Cover; Clause 3.4.4. Ground cover plants shall have healthy tops to a size proportionate to the above root requirements typical of the species.

2.2 CONIFEROUS TREES

2.2.1 All trees shall be suitable for immediate planting and be of normal shape and quality for the species. Trees with broken or missing leaders will not be accepted.

2.2.2 Spruce varieties shall have uniform branching which starts no higher than 300 mm from the root collar. On Pine varieties, branching shall be no higher than 600 mm from the root collar.

2.2.3 The root balls shall contain all the original soil in which the tree has grown and shall be free of all weeds and vegetation. It shall be firmly wrapped in burlap and secured to prevent any soil from spilling or drying out. Any increase or decrease in tree size shall require a corresponding adjustment to the root ball size to conform to C.N.L.A., Canadian Standards for Nursery Stock.

2.3 DECIDUOUS TREES

2.3.1 All trees are to be suitable for planting as street trees and should show signs of good trunk taper and free of branches to a point not less than 60% of tree height.

2.3.2 All bare root trees shall have a heavy fibrous root system that has been developed by proper cultural treatment, such as transplanting or root pruning and shall have a spread not less than specified.

2.3.3 The root ball shall contain all the original soil in which the tree has grown and shall be free of all weeds and vegetation. It shall be firmly wrapped in burlap and secured to prevent any soil from spilling or drying out. Any increase or decrease in tree size shall require a corresponding adjustment to the root ball size to conform to C.N.L.A., Canadian Standards for Nursery Stock.

2.3.4 Trees collected from native stands or established plantings must be so designated. Root balls shall be at least ten percent larger in diameter than Nursery grown stock.

2.3.5 All trunks shall be straight, clean and free from stubs and portions of decay, splits, or other damage.

2.4 OTHER MATERIAL

- Wire Basket
- Burlap
- Guy Wires
- Tree Anchors
- Tree Stakes
- Weed Liner
- Tree Grates and Guards

3. EXECUTION

3.1 PLANTING SEASON

Plant trees, shrubs and ground covers only during periods that is normal for such work. It is recommended that all coniferous material should be planted suggested planting in spring season only.

3.2 SITE PREPARATION

3.2.1 All rough grading, excavating work for planting beds and the preparation of subgrades, which are to receive planting soil mixture shall be as described below.

3.2.2 Dig out the tree root holes/pits, planting beds and shrub root holes and remove excess soil off site or as directed by the City.

3.3 PLANTING TOPSOILS

Soil mixes shall be as shown on standard details and as specified by Section 02910 - Topsoil; Section 2.

3.4 DIGGING OF PLANTS

3.4.1 Immediately after digging all plants, the root system shall be kept moist to prevent drying out until planted.

3.4.2 Plants specified "Bare Root" shall be dug and moved while dormant, with the major portion of the fibrous root system provided.

3.4.3 All plants specified as "Balled and Burlapped" shall be dug and moved while dormant unless directed otherwise by the City, with the major portion of the fibrous root system provided.

3.4.4 Ball sizes shall be sufficiently large to contain at least 75% of the fibrous root depth. The sizes of root balls for trees shall be as specified in the Canadian Standards for Nursery Stock from C.N.L.A. Ball sizes are a minimum and shall be adjusted according to growth habits of plants.

3.4.5 Ball sizes for coniferous trees to be:

Tree Height Range	Ball Diameter
1.8m (6') - 2.4m (8')	86 cm (34")
2.5m (8') - 3.0m (10')	100 cm (40")
3.1m (10') - 3.5m (12')	122 cm (48")

Note: All pines to have oversized minimum root ball diameter (for trees 2.5 m height) of 1150 mm (3'10").

3.4.6 Wrap root balls as per C.N.L.A., Canadian Standards for Nursery Stock.

3.4.7 All plants specified may be moved with a mechanical tree spade providing adequate roots are kept as specified and provided that no excavation shall occur within 1m of utility trench alignments.

3.4.8 Minimum utility clearances must be maintained from the edge of the excavation by the tree spade of the involved utility must be contacted for approval and/or safety procedures required, i.e. hand digging.

3.4.9 Before removing plants from containers for planting, the plants shall be well watered to reduce injury.

3.4.10 In many plants, roots have a tendency to circle the container/pot. When this is apparent, outside roots should be gently loosened and the container cut vertically with a sharp knife in one or two places and the container/pot carefully removed. When the circling roots cannot be straightened or cut without affecting the structural root system the plant will be rejected. The tree must be securely rooted at FAC.

3.5 PLANTING BED PREPARATION

3.5.1 Beds that contain shrubs and trees shall be prepared to a depth of 450 mm. Reference detail LA108A, unless otherwise stated within specifications scope of work.

3.5.2 Beds that contain only trees shall be prepared to a depth of 300 mm. Reference detail LA108, unless otherwise stated within specifications scope of work.

3.5.3 Bed edge must be cut to a vertical depth of 100mm and filled with mulch.

3.5.4 Landscape edgers and weed liners are not permitted.

3.5.5 Cut back weed liner, if provided, at each tree and shrub location with three cuts at 120 degrees from the centre of the proposed plant. Ensure weed liner is cut back sufficiently to accommodate excavation of root zone for tree or shrub. Excavate tree and shrub root holes as per standard planting details and install plant material.

3.5.6 Construct watering swales using topsoil from around the base of the plant and roll back the weed liner. The use of watering swales is not identified on the standard details but may be required by the City and shall be at the Contractor's expense.

3.5.7 Install optional landscape edgers around perimeter of planting shrub beds. Landscape edging to be a maximum 12 mm higher than existing surrounding grades. Ensure weed liner, if provided, is rolled down the interior face of the landscape edging a minimum of 100 mm

3.5.8 Install 100 mm of wood mulch as specified by landscape drawings. Finished grade of mulch to match adjacent turf grades or top of landscaping edging upon final settlement. Reference detail LA108.

3.6 TREE AND SHRUB PLANTING OUTSIDE PREPARED PLANTING BEDS

3.6.1 Staked locations of all trees and shrubs to be provided by the City prior to installation.

3.6.2 All trees shall have a minimum of 300 mm of class B topsoil surrounding the sides of the root ball. Reference details LA102 – LA113.

3.6.3 All shrubs shall have 150 mm of specified topsoil surrounding the sides of the containerized roots or exposed bare roots. Reference details LA108 – LA110.

3.6.4 If soil conditions warrant and as directed by the City, root holes dug by mechanical equipment shall be scarified to ensure that no glazed walls remain in root holes.

3.6.5 For tree root holes dug by a tree spade, provide root ball support of compacted native materials in the base of the root hole. Reference details LA104 – LA105. Soil glazing from the tree spade shovels must be scarified.

3.6.6 The depth of the planting hole should be 40mm less than the height of the root ball. Adjust hole depth (as needed) to correct the depth of the tree, the top of the root ball should be 40mm above grade.

3.6.7 Trees and shrubs shall be faced to give the best appearance or relationship to adjacent structures, walkways or park features.

3.6.8 Planting topsoil shall be firmly tamped in place in such a manner that the plant retains its vertical position. Particular care shall be taken to ensure that no air pockets remain under or around the roots. The planting topsoil shall be thoroughly watered immediately after tamping. All non-porous or non-biodegradable containers shall be completely removed. Any settling of planting topsoil shall be brought up to the intended grade after settlement and prior to issuance of the Final Acceptance Certificate.

3.6.9 When planting, topsoil is installed up to about one half of the root ball height, ties shall be cut and the top portion of the burlap on B & B plants shall be cut back carefully, not disturbing the root ball, remove excessive topsoil to expose the original root flare and remove all girdling roots.

3.6.10 Top 1/3 of wire baskets to be folded back or removed and the top 1/3 of the burlap to be cut back and removed from root ball hole. If circling roots are found in the rootball, cut the root at the beginning of the circling.

3.6.11 Damaged or broken roots of bare root stock should be cut back with a sharp knife to living parts remaining. Spread roots out gently and evenly in the root hole and complete installation of topsoil.

3.6.12 The planting topsoil shall not be placed while frozen or muddy.

3.6.13 Add 100 mm of wood chip mulch over exposed portion of tree root ball and extend mulch 150 mm beyond edge of root hole. Reference details LA102 – LA113.

3.7 CONSTRUCTION COMPLETION INSPECTION

3.7.1 Plant pits and tree and shrub beds shall be free of weeds, leaves, broken branches, and rubbish, and left in a neat and tidy condition. Soil within the drip line of the tree or soil ring (whichever is greater) shall not be cultivated.

3.7.2 All plants shall be alive and in a healthy, satisfactory growing condition.

3.8 WARRANTY

3.8.1 The Contractor is fully responsible for the general health and quality of all plant material delivered and installed.

3.8.2 All plant material shall be guaranteed for a period of one year, unless otherwise stated within the project scope of work/specifications, from the date of issuance of the Construction Completion Certificate. There is no warranty requirement on annuals, unless further noted.

3.8.3 All plant materials found dead or not in a healthy, satisfactory growing condition or which, in any other way, does not meet the requirements of the specifications, shall be replaced immediately by the Contractor at the Contractor's own expense.

3.9 MAINTENANCE

3.9.1 Maintenance shall include all measures necessary to establish and maintain all plants in an acceptable, vigorous and healthy growing condition for a period of one year from the issuance of a Construction Completion Certificate and until the issuance of the Final Acceptance Certificate.

3.9.2 Cultivated and weeding of planting beds and tree pits is the responsibility of the Contractor. The City may direct the use of herbicides for weed control; they shall be applied in accordance with manufacturer's recommendations by a licensed applicator. Damage resulting from the Contractor's use of herbicides shall be remedied at the Contractor's own expense.

3.9.3 Pruning, including the removal of dead, broken and diseased branches, immediately upon installation and in accordance with approved pruning methods.

3.9.4 The City may direct the use of chemicals and pesticides as control measures. If used they shall be applied in accordance with the manufacturer's recommendations by a licensed applicator. Damage resulting from the Contractor's use of chemicals and pesticides shall be remedied at the Contractor's own expense.

3.9.5 Maintain all accessories in good condition such as tree guy wires and tree stakes. The City will direct the repair or replacement of all such accessories when required. If the trees are in the third growing season the tree stakes and wires shall be removed.

3.9.6 Watering trees and shrubs in sufficiently to meet plant requirements.

3.9.7 **Water in tree and shrub root holes:** All planting beds shall be filled to grade with planting topsoil and watered in. The use of a water probe to ensure the removal of all air spaces in the topsoil surrounding the plant's root ball is an acceptable method of watering in. The use of a water probe will be used to water in all tree spade transplanted trees.

3.9.8 The Contractor is responsible for supplying, loading, hauling and distributing water and fertilizer for maintenance purposes.

3.9.9 Newly planted trees may require the application of a completely water-soluble high phosphorous fertilizer e.g. 10-52-10. No fertilizer should be applied during July and August. The Landscape Architect may recommend other fertilizers for trees, shrubs and ground covers as required. The Landscape Architect will provide written confirmation of the dates for water and fertilizer applications prior to the issuance of the F.A.C. by the Community Services Department.

3.9.10 Straighten all plants, which lean or sag during the warranty period. Straightening of trees is to be done in a timely manner to assist in establishment.

3.9.11 At the time of inspection for F.A.C. and at the conclusion of the warranty period, all non-mulched planting beds and tree pits shall be freshly cultivated. All planting beds shall be free of weeds, leaves and debris and shall be in a tidy condition. Mulch shall be raked.

3.10 PRUNING

3.10.1 All deciduous plants shall be pruned by or directly supervised by a certified professional (ISA Certified Arborist, Landscape Industry Certified Technician, Landscape Horticulturist (Red Seal or LGAP) or equivalent designation immediately after planting and as required during the warranty period according to the best management practices as defined by the International Society of Arboriculture in accordance with ANSI A300 Pruning Standards. The amount of pruning shall be limited to the minimum necessary to remove dead or injured branches. Pruning shall be done in such a manner as to preserve the natural character and shape of the plants. Only clean, sharp tools shall be used. All cuts shall be clean and cut to the branch collar, leaving no stubs. Cuts, bruises, scars or tears on the bark shall be traced back to living tissue and removed. The affected areas shall be shaped so as not to retain water.

Pruning outlined for these species as follows:

Birch	May 15 to June 15
Maple	June to July
Elm	October 1 to March 31

Or as approved by the Project Manager.

3.10.2 Do not cut a leader unless a lateral can be trained to take its place.

3.11 STAKING AND GUIDING

Support plants with stakes and guy wires immediately after installation.

3.12 TREE SUPPORT:

3.12.1 Trees shall be braced upright in position by guy wire and stakes in accordance with the following table:

Coniferous: Tree Height	Tree Support Method
Up to 1.5 m	1 stake with 1 tie (optional)
1.5 m - 3.0 m	2 stakes with 2 ties (optional)
3.0 m - 3.5 m	3 guy wires with 3 anchors

Deciduous: Tree Caliper	Tree Support Method
Up to 30 mm	1 stake with 1 tie
30 mm - 100 mm	2 stakes with 2 ties
100 mm - 150 mm	3 guy wires with 3 anchors
150 mm and over	4 guy wires with 4 anchors

3.12.2 Wire for trees requiring guy wiring shall be looped around the tree and anchored in such a manner that looped wire will not interfere with normal growth. Guy wires shall be placed around the trunk at a point to ensure adequate support of the tree and in such a manner that the tree trunk or branches will not be subjected to undue strain or injury. Anchors shall be equally spaced around the tree pit. Reference details LA102 – LA113.

3.12.3 Anchors required for the support of staked trees shall be painted metal "T" bars 40 mm x 40 mm x 5 mm thick and 700 mm to 750 mm long. Wires for fastening to anchors shall be pliable #12 galvanized wire. If used these shall be factory galvanized and of sufficient strength to withstand any wind pressure.

3.12.4 Anchors shall be left 150 mm above grade unless otherwise directed by the City and colour coded to Community Services specifications.

3.12.5 **Stakes:** "T" bar steel stakes 40 mm x 40 mm x 5 mm thick x 2.1 m length, U-bar stakes will be approved as a substitute, primed with one coat of zinc-rich paint to CGSB 1-GP-1816. Colour to be approved by the City. Top 300 mm tree stake colour coded to Community Services specifications. See Section 02918 – Colour Coding of T-bar Tree Stakes. Ties shall be placed around the trunk to provide adequate support and to prevent damage.

3.12.6 The Contractor shall be responsible for keeping guy wires taut at all times and replacing broken guy wires in accordance with the specified warranty period and to ensure that the guy wires do not damage the tree trunk during growth.

3.12.7 Guy wires shall be flagged with fluorescent orange coloured tape. All guy wires are to be folded or bent in such a fashion so as not to be exposed outwardly. New black rubber hose, two-ply, reinforced and 12 mm diameter, or approved equal, shall be used to encase wires where they circle the trunk or branches.

3.13 REPLACEMENTS

3.13.1 The cost of replacements resulting from rodent damage, theft, vandalism, carelessness, or neglect on the part of others, or any replacements caused due to circumstances beyond the control of the City shall be borne by the Contractor before the issuance of a Final Acceptance Certificate.

3.13.2 All required replacements shall be by plants of the same size and species as specified on the Plant List and shall be supplied and planted in accordance with the landscape drawings and specifications.

3.14 TRANSPLANTING EXISTING TREES

3.14.1 The City of Edmonton Tree Policy should be referenced when transplanting trees in accordance with the following specification.

3.14.2 Size of root ball: 12 times the tree caliper measured at 300 mm above grade and deep enough to enclose 75% of the existing root depth. All stock greater than 100 mm will be measured 1500 mm above ground level.

3.14.3 Basket, double burlap and drum lace, or wire basket root ball before moving, or dig and transport by tree spade.

3.14.4 Place excavated tree spade root plugs in former tree locations where possible.

3.14.5 Size of new tree root hole is to be in accordance with standard details.

3.14.6 Plant, stake and guy wire, and maintain as outlined herein.

3.14.7 Warranty period for Nursery and "collected" as follows:

- All stock 0 - 80 mm* shall be 1 year.
- All stock 90 - 150 mm shall be 3 years.
- All stock 150 - 200 mm shall be 4 years.
- No materials above 200 mm will be accepted.

* Refer to clause 4.8.3 in the Landscape Design and Construction Standards.

3.15 PROTECTION OF EXISTING TREES

The protection of existing trees shall be as per City of Edmonton Tree Policy C456A.

3.16 RESTORATION

Restore pavement, gravel stops, grassed area, planted area and structures damaged or disturbed during execution of work, in a manner satisfactory to City standards.

END OF SECTION