11. Landscaping Standards – Plant Material

PART I – DESIGN

All landscaping and plant materials to be deer resistant and in accordance with FireSmart best practices.

11.1 Minimum Setback Requirements

11.1.1 Trees shall be spaced from infrastructure in accordance with the minimum setbacks provided in the following table, unless specified otherwise:

Infrastructure Designation	Setback Distance for Trees
Existing Fences	3.5 m
Median and Road Curb Face	2.0 m
Driveways	2.0 m
Fire Hydrants	2.0 m
Street Lights (Arterial Roadways) Street Lights (Collector and	5.0 m
Local Roads)	3.0 m
Buried Utilities (power, cable, telephone, traffic signals) Power	1.0 m
Hardware	3.5 m
Telephone Pedestals	1.5 m
Water Valves	1.8 m
Buried Gas Mains and Services	1.5 m
Street Corners (distance from intersecting curb) Yield and Stop	12.0 m
Signs (Arterial Roadways)	12.0 m
Yield and Stop Signs (Collector and Local Roadways) Bus Stop	7.0 m
Signs and other signs	5.0 m
Sidewalks and Trails	2.0 m
Fence Lines	2.5 m

11.1.2 Trees shall not be planted in any location from which the tip of any branch will grow closer to overhead power lines than 2.4 m laterally or 4.5 m vertically.

11.1.3 Boulevard trees shall be diversified to minimize pests and disease, and shall be planted at equal intervals, which may vary depending on their ultimate size, in accordance with the following:

a) Large and medium size trees: 10 to 13 m spacing.
b) Small size trees: 7 to 10 m spacing.

11.2 Tree Selection

11.2.1 Tree selection shall be consistent with the following requirements:

a) Adequate, year-round sightlines shall be maintained for pedestrian and vehicular safety.
b) Minimum 1.8 m branching height for all trees.
c) The following tree species are acceptable for landscaping within public areas. Proposed alternates shall be subject to the review and acceptance of the Town.
d) Due to climate change and the increasing risks of new pests, the Town recommends planting a variety of species on any residential block (i.e. larger species for larger boulevards, and smaller species for a smaller boulevard, alternating species along a block, patterned plantings etc.).
e) No fruit-bearing species are permitted near sidewalks or trails.

*Fruit or nut bearing trees are not permitted near sidewalks or trails. These trees should be planted in beds to reduce maintenance. Alternate trees in Boulevard)
** Prone to disease (Cotton Psyllid, Bronze Leaf, Black Knot)

11.2.2 Refer to the following chart for recommended coniferous trees:

Botanical Name	Common Name	Min. Height at Planting	Mature height
Abies sp. Picea spp.	Fir	2.4 m	8 – 10 m
Pinus sp. Larix sp.	Engleman, Norway, White, Baby Blue and Colorado	2.4 m	15 m
	Spruce	2.4 m	15 m
	Swiss Stone Scot, White, Lodgpole, Ponderosa Pine	2.4 m	3 – 10 m
	Siberian Larch, Tamarack		

11.2.3 Refer to the following chart for recommended deciduous shrubs:

Botanical Name	Common Name	Min. Height at Planting	Mature ht./spr.
Berberis spp. Caragana spp.	Barberry	400 mm	0.6–6 m/0.6–6 m
Cornus spp.	Caragana	400 mm	0.6–6 m/0.6–9 m
Euonymus spp.	Dogwood	400 mm	0.4–3 m/1.2–3 m
	Winged and Dwarf Narrow-leaved	400 mm	0.6–1.5/0.6–1.5 m
Hippophae spp. Hydreangea	Burningbush		
spp. Loniceria spp.	Sea Buckthorn	400 mm	Up to 4 m
Philadelphus spp.	Hydrangea	400 mm	0.6–2.4 m/0.6–2.4 m
Physocarpus sp. Potentilla	Honeysuckle	400 mm	0.6–3.7 m/1-3 m
sp.	Mock Orange	400 mm	0.6–1.5 m/0.3-1.5 m
Ribes spp.	Ninebark	400 mm	0.4–3 m/0.6-3 m
Rosa spp.	Potentilla	400 mm	0.6–1 m/1 m
Sambucus spp.	Currant	400 mm	1.2–2.1 m/1.2-2.1 m
Spirea spp.	Rose	400 mm	0.6–3 m/0.6-1.8 m
Syringea spp.	Elder	400 mm	0.9–7.6 m/0.9-5.5 m
Corylus cornata	Spirea	400 mm	0.4–1 m/0.6-2.4 m
Viburnum spp.	Lilac	400 mm	0.9–3 m/1.5-5 m
	Beaked Hazelnut	400 mm	0.4-3 m/1.2-3 m
	Cranberry	400 mm	0.6–3 m/1-3 m
Salix Spp.	Blue Fox, Dwarf Arctic Willow	400 mm	0.6 – 1.5 m

11.2.4 Refer to the following chart for recommended coniferous shrubs:

Botanical Name	Common Name	Min. Spread at Planting	Mature size
Juniperus spp. Juniperus	Common, Horizontal, Pfitzer, Bar Harbor, Savin Juniper	300 mm	0.3 – 1 m
scopulorum Picea abies var.	Rocky Mountain Juniper Compact, Gregoryana, Nest Spruce	300 mm	Up to 5 m
Picea pungens var. Pinus	Globe,	300 mm	1.5 m Up
sylvestris var. Pinus mugo	Hoopsii, Koster Spruce Sentinal,	300 mm	to 3 m Up
var.	Green Compact Pine Mugo Pine	300 mm	to 2 m
	var.	300 mm	0.6 – 3 m
Arctostaphylos ura-ursi	Kinnikinnick	300 mm	Up to 3 m

11.3 Planting Season

11.3.1 Planting must be done between May 1 and September 15 and during the normal planting season for the type of plant being planted.

PART II – GENERAL

11.4 Scope

11.4.1 Supplying trees, shrubs, groundcovers and other associated materials; planting, transplanting, plant maintenance and inspection.

11.5 Substitutions

11.5.1 All requests for substitutions of planting materials shall be vetted through the consultant responsible for preparing the contract drawings. Such requests shall be forwarded to the Town for approval prior to installation.

11.6 Product Delivery, Storage, and Handling

11.6.1 Plant material shall be handled with care and skill to prevent injury to trunk, branches and roots.

11.6.2 All branches shall be carefully tied-in in such a way as to prevent damage, breakage or bruising before transporting and the plants protected during shipment by tarpaulin(s) or other suitable covering to prevent excessive transpiration. All points of contact between plant material and conveyance vehicle shall be padded.

11.6.3 When the temperature exceeds 20°C, plants shall not be shipped without authorization from the developer's landscape architect/Town's representative. When temperature exceeds 25 degrees C, planting of plant material is not permitted. If trees are shipped at the above referenced temperature, the Town has the authority to issue a Stop Work Order.

11.6.4 Plants shall be transported at a reasonable speed to prevent transpiration.

11.6.5 Plants with broken or abraded trunks or branches or with broken or cracked root balls, or which are badly desiccated, or bare root plants that have broken dormancy are subject to rejection.

11.6.6 Roots or root balls of all plants shall be adequately protected at all times from the sun and from drying winds and frost.

11.6.7 All balled and burlapped plants which cannot be planted immediately upon delivery shall be set on the ground and shall be well protected with soil, wet moss or other acceptable material not longer than 24hours. Bare root plants that cannot be planted immediately shall be planted or heeled-in in trenches, immediately on delivery. All plants shall be kept moist until planting begins.

11.6.8 Damaged plants supplied by contractors shall be replaced at no cost to the Town.

11.7 Inspections

11.7.1 The Town will inspect the marked tree locations upon 48 hours' notice and notify the developer of any revisions that may be required, or will approve the proposed tree locations as marked.

11.7.2 The Developer shall notify the Town prior to the start of a planting project to facilitate inspections during the process. The Developer shall also notify the Town when the planting project is completed. The Town's representative will conduct an inspection of the planted trees, upon 48 hours' notice, and notify the Developer of any deficiencies that may require correction.

PART III - PRODUCTS

11.8 Plant Materials

11.8.1 Trees, Shrubs, Vines, Groundcovers

a) All plants shall be nursery grown under cultural practices recommended by the Canadian Nursery Trades Association unless specific instructions have been issued by the landscape architect and accepted by the Town, for the collection from native stands, woodlots or other unmaintained areas.
b) All nursery-grown material shall meet the horticultural standards of and comply with all applicable sections of the latest edition of the *Canadian Standards for Nursery Stock*, by the Canadian Nursery Trades Association. All such material shall have been transplanted and/or root pruned regularly to create a fibrous ball but neither transplanted nor root pruned within the nine (9) months prior to delivery.
c) Any trees dug from native stands, wood lots, orchards or neglected nurseries and which have not received proper cultural maintenance as advocated by the Canadian Nursery Trades Association, shall be designated as “collected plants”. The use of “collected plants” will not be permitted.
d) All plants shall be typical of their species or variety and shall have a single central leader and balanced branching habit. They shall be structurally sound, healthy and vigorous, well branched and densely foliated when in leaf. They shall be free from disease and insect pests, eggs or larvae, rodent damage, sunscald, frost cracks and other abrasions or scars to the bark. They shall show vigorous bark on all edges and all parts shall be moist and show live, green cambium tissue when cut.
e) All plant materials shall have been grown in the climate of Canadian Horticultural Zone 2 or 3 for at least two (2) years. Plant material brought in from other provinces and/or states must be accepted by the Town prior to planting.
f) Trees purchased from outside Northern Alberta (i.e. south of Red Deer) must be grown for two years prior to planting.
g) Plant sources and history must be supplied to the Town prior to planting.
h) Trees shall have one sturdy, reasonably straight, and vertical trunk and a well-balanced crown with a fully developed leader, unless that would be uncharacteristic of the species and with the exception of Malus baccata plus associated hybrids and cultivars (flowering crab-apples) single, central leaders. All trees with weak crotches may be rejected.
i) All trees shall be free of disease, insect infestation, rodent damage, sunscald, frost cracks, and other abrasions or scars to bark. All trees must be certified pest and disease free. All parts of the tree shall be moist and show live, green cambium tissue when cut. No more than 1/3 of the total height of the tree shall be clear trunk.
j) Trees with branches which may grow to interfere with vehicular or pedestrian traffic are not acceptable in boulevards where the clear stem shall be not less than 1.8 m.
k) Shrubs shall have a natural form typical of the species with interfering branches removed and shall have the number of canes as specified in the *Canadian Standards for Nursery Stock*, by the Canadian Nursery Trades Association.
l) Vines shall have at least three runners, each of 300 mm minimum length.
m) Ground covers shall have well developed tops of a size proportional to the roots, typical of the species.
n) Plants that have been sheared to produce an untypical shape or shoot density are not acceptable.
o) All plant dimensions shall be measured when the branches are in their normal position. ‘Height’ and ‘spread’ refer to the main body of the plant and not the dimension from base of root ball to branch tip or from branch top to branch tip. The ‘Caliper’ of a tree shall be measured 0.9 m to 1.2 m above the soil collar of the tree as it stood in the nursery and refers to the diameter of the tree at breast height (DBH).
p) All plant material shall conform to the measurements specified in the landscape plan, unless the Town authorizes a substitution. If larger plants are used, the ball of earth shall be increased in proportion to the size of the plant. Refer to Canadian Standards for Nursery Stock (CSLA).

11.8.2 Digging of Plants

a) Dry soil shall be watered two or three days before digging trees or shrubs.
b) All plants shall be dug and delivered to the site as specified on the Plant List.
c) Tree spades used for lifting plants shall have sharp blades.
d) Immediately after digging, the root systems of all plants shall be kept moist to prevent drying out until planted on the site.

e) Deciduous trees and shrubs in full leaf and dug in late spring or early summer shall be hardened off before replanting by placing in a cool, sheltered area as soon after digging as possible, placed close together, tops kept moist by syringing and balls by sprinkling or wetting down with water. Root balls shall be covered with wood chips, damp straw or canvas and held in this position for 24 to 48 hrs before planting.
f) All plants specified as 'Balled and Burlapped' (B/B) shall be dug while dormant and moved with solid balls wrapped in burlap.
g) No plants shall be used when the ball of earth surrounding the roots has been cracked or broken preparatory to or during the process of planting, or when the burlap, staves and ropes, required in connection with their transplanting, have been removed.

11.8.3 Root Ball

a) The size of root ball for trees must be greater than the minimum size below
b) Deciduous trees:

Caliper	Root Ball Diameter
60 mm	800 mm
75 mm	900 mm
100 mm	1,200 mm
125 mm	1,500 mm
150 mm	1,800 mm
200 mm	2,300 mm
250 mm	2,440 mm

For this table, the caliper shall be measured 150 mm above the soil collar of the tree. For deciduous trees of caliper exceeding 250 mm, root ball diameter shall be increased 150 mm for every additional 25 mm of caliper.

c) Coniferous trees:

Height	Root Ball Diameter
2.25-2.50 m	1,200 mm
2.50-2.75 m	1,400 mm

The height shall be measured from the soil collar of the tree. For coniferous trees over 2.75 m in height, root ball diameter shall be increased 150 mm for every 300 mm in height.

11.9 Edger

11.9.1 Manicured planting beds shall incorporate a spade cut edge.

11.9.2 Weed liner will not be permitted.

11.10 Fertilizer

11.10.1 For the first application, soluble fertilizer shall be delivered mixed as specified for tree and shrub growth in the topsoil backfill report from an acceptable soils laboratory.

11.11 Tree Stakes, Ties, and Guys

11.11.1 Tree stakes shall be "T" bars of steel, 40 mm x 40 mm x 5 mm thick and 2.1 m in length. "U"- bar stakes may be used where accepted by the Town.

11.11.2 Stakes shall be primed with one brush coat of zinc-rich paint to CGSB1-GP-1816

11.11.3 Tree ties shall be 10-gauge galvanized wire inserted into a 200 mm length of 10 mm diameter polyethylene tubing to protect the tree at the support point.

11.11.4 Guys shall be double lengths of 9-gauge galvanized wire.

11.12 Water

11.12.1 Water shall be clean and free of any substance that may inhibit vigorous growth of the plants.

PART IV - EXECUTION

11.13 Planting Operations – Trees and Bare Root Plants

11.13.1 Tree pits in boulevards shall be dug in such a way that the minimum separation between the edge of the sidewalk and the edge of the excavation is 225 mm. In narrow boulevards pits may be elliptical rather than circular in plan, and dug two to three times wider than the root ball.

11.13.2 The depth of planting beds and pits shall be adjusted to permit a layer of native soil under balls or roots of all plants to ensure they are firmly bedded. If the sides and bottom of the planting pit are glazed or consist of dry and heavy clay, a hand spade shall be used to scarify the soil to encourage root elongation before planting.

11.13.3 Planting pit surfaces, whether sides or base, which are of dry clay or glazed shall be scarified to facilitate root elongation and moisture movement.

11.13.4 In poorly drained sites, trees and shrubs shall be planted so the top of the root ball is above grade.

11.13.5 All trees shall be planted in the same orientation as they were in the nursery, where possible.

11.13.6 Plants shall be set in the center of pits, plumb, straight, and at such a level that after settlement the crown of the plant will be no lower than the surrounding finished grade.

11.13.7 Topsoil backfill of tree pits shall be carefully tamped around the root ball for the first one third to half of the hole depth to help stabilize the ball. The loose soil shall be worked down into the remainder of the pit with a hand spade while being flooded with water to ensure all air pockets are eliminated and filled with muddy soil.

11.13.8 If the sides of the root ball have become crusted through drying-out or digging under wet conditions, the top half of the affected area shall be slit with a sharp spade or shovel to facilitate root extension from the ball surface into the backfill soil.

11.13.9 After a burlap wrapped root ball is in the planting pit, half backfilled, the wire basket shall be cut back to expose the top third of the root ball, and basket and burlap shall be removed. The remaining burlap shall be slit along the sides with a sharp knife. No burlap shall be allowed to remain visible after planting to wick moisture away from the soil ball into the atmosphere. Heavy or treated burlap or plastic shall be removed before the tree is planted to prevent formation of a moisture barrier around the ball. When burlap wrapped plant material is being planted in clay soils, all the burlap shall be removed. The wire basket may be removed completely contact Town Public Works for details.

11.13.10 After the tree is planted, a circular soil dike, 100 mm in height, shall be constructed just outside the root ball's surface area to prevent run-off during watering.

11.13.11 For all trees with trunks exposed to lawn mowing operations, a 100 mm depth of deciduous wood chip mulch shall be placed around the trunk base and extended a further 300 mm radially from the trunk to avoid mower damage, pest disease, and bark rot from occurring.

11.13.12 Install 100 mm depth of mulch over the top of the root ball and extended a further 300 mm radially from the tree trunk to discourage winter damage of the bark by rodents and to allow air circulation to the root system.

11.14 Planting Operations – Shrubs

11.14.1 Shrubs shall be planted in topsoil beds of minimum 650 mm depth.

11.14.2 Planting topsoil shall be firmly tamped in place around root balls of shrubs and bare root plants while ensuring that the plant remains vertical. Particular care shall be taken to ensure that no air pockets remain under or around the roots. Planting topsoil shall be thoroughly watered immediately after tamping.

11.14.3 No planting, except ground covers, vines, and herbaceous plant material, shall be placed closer than 400 mm at maturity to the edge of shrub beds, hard surfaces, or building foundations.

11.15 Stakes, Ties, and Guys

11.15.1 Trees shall be supported by stakes and ties or by guy wires in accordance with the following schedule:

a) Coniferous Trees

Height	Staking Method
< 1.5 m	2 steel stakes and 2 ties
1.5-3.0 m	2 steel stakes and 2 ties
3.0-3.5 m	3 guy wires and 3 anchors
3.5-4.5 m	4 guy wires and 4 anchors
> 4.5 m	Refer to deciduous trees > 200 mm

b) Deciduous Trees – Bare Root

i) To 75 mm caliper, use 2 steel stakes and 2 ties.

c) Deciduous Trees – Balled and Burlapped or Tree Spade

Caliper	Staking Method
< 75 mm	2 steel stakes and 2 ties
75-200 mm	3 guy wires and 3 anchors
≥ 200 mm	4 guy wires and 4 anchors

11.15.2 Connection of Ties and Guy Wires to Trees:

a) All exposed portions of tree stakes are to be rust free, scaled, primed and painted brown. Tree stakes are to be a minimum of 2.0 linear metres in length, plain T-posts (1.33 lbs/ft) complete with 1 1/2" x 1 3/8" x 84" punched with 7 holes.
b) All ties and guy wires shall be looped in a figure-eight at least 3 times around the tree trunk and attached to stakes or anchors in such a way that they can be kept taut to form an open "Figure-8", branches are protected from undue strain, and the tree's bark is protected from damage.
c) Where the guy wires encircle the trunk or branches they shall be encased in new, 12 mm diameter, two-ply, reinforced, black-rubber hose.
d) Turnbuckles shall be factory galvanized and shall have eyes with a length of 150 mm and threaded openings of 10 mm diameter for tightening.
e) Fluorescent warning flags shall be attached to guy wires.

11.15.3 Bare Root Tree Staking

a) The stakes shall be driven vertically a minimum depth of 600 mm into the undisturbed soil of the base of the tree pit before the plant is placed in position.
b) When two stakes are used they shall be located at northwest and southwest of the tree.

11.15.4 Balled and Burlapped Trees and Tree Spade Plants Staking

a) The stakes shall be driven vertically a minimum depth of 300 mm into the undisturbed soil and shall be located just outside the root ball or tree plug to avoid any root damage.
b) When two stakes are used they shall be located at northeast and southwest of the tree.

11.15.5 Tree stakes and guy wire shall be removed following the maintenance period after combined review by Town and Consultant. They shall be removed by the contractor prior to the FAC inspection.

11.16 Pruning

11.16.1 Immediately following planting, any dead, broken, or interfering branches shall be pruned together with any diseased branches which have not caused the plant's rejection. No plants having disease are to be planted and may be rejected by the Town.

11.16.2 The amount of pruning shall be limited to the minimum necessary and exceed no more than 25% of the living foliage in one season.

11.16.3 One section of any bad fork or weak crotch which has not caused the plant's rejection shall be removed at transplanting time.

11.16.4 The manner of pruning shall preserve the natural character of the plant. This is subject to pruning 25% of crown maximum.

11.16.5 Due to the risk of Dutch Elm Disease, elm trees shall only be pruned between the period of October 1 and March 31, when the Elm Bark Beetle is inactive.

11.16.6 Pruning tools shall be clean and sharp.

11.16.7 All pruning cuts shall be clean and leave no stubs or rough wood and be in accordance to the ANSI Z133.1 Standards. Small cuts shall be close to the branch collar and parallel to the adjoining branch or trunk. On large limbs, flush cuts shall be avoided and cuts made at the collar shall have the lower part slanting slightly away from the trunk to leave a smaller wound.

11.16.8 Tree trunks conduct moisture and nutrients from the roots to the crown of the tree. This function takes place in the outer part of the woody stem called the sapwood. If the sapwood is cut, bruised, or scarred in such a way that it may affect the uptake of moisture and nutrients, the tree shall be replaced. If the affected area is small enough not to limit the uptake of moisture and nutrients, the affected area shall be shaped with a sharp, clean knife so as not to retain water, which may cause decay.

11.16.9 Bark that is cut, bruised, or scarred shall be cut back to living tissue with a clean edge. The affected area shall be shaped with a sharp knife so as not to retain water.

11.16.10 Wound surfaces shall not be treated with wound-dressing products unless otherwise specified or directed by the Town.

11.16.11 As a rule, growth is maximized if pruning is done just before the period of rapid growth in the spring. Prune during proper times in accordance with the following guidelines:

a. Shade Trees – October 15 to April 15
b. Birch and Maple – June 15 to July 15
c. Fruit trees – March 15 to April 15
d. Evergreens – April 15 to May 15
e. Elm Trees – In according to provincial legislation

11.17 Construction Completion Inspection

11.17.1 The CCC shall be issued following a satisfactory inspection by the Town's representative, developer's representative and contractor which all plant material has been supplied and installed in accordance with the approved drawings and any approved substitutions and is alive and healthy. The maintenance period of two (2) years begins to run from the date of the satisfactory inspection. All plant material requiring wood chip mulch shall be installed prior the Construction Completion Certification and topped up prior to the Final Acceptance Certification.

11.18 Warranty

11.18.1 Replace any plants that die or appear to be dying during the Warranty Period. In case of any doubt regarding the condition and satisfactory establishment of a rejected plant, the Developer may elect to maintain such a plant through another complete growing season at the end of which the rejected plant, if found to be dead or in an unhealthy or badly impaired condition, shall be replaced by the Developer. Any replaced plant material shall have a maintenance period of one (1) year, unless otherwise authorized.

11.19 Maintenance

11.19.1 Maintenance shall include all measures and activities necessary to establish and maintain plants in an acceptable, vigorous, and healthy growing condition for the duration of the Warranty Period.

11.19.2 Refer to Section 8.18.

11.20 Final Inspection

11.20.1 At the time of final inspection, all the plants shall be alive, healthy and in good condition, root balls and shrub beds shall be weed-free with the specified depth of mulch throughout.

11.20.2 Tree stakes and guy wires shall be removed immediately prior to final inspection.