

**TREE PLANTING PRIORITIES,  
REQUIREMENTS, PROCEDURES  
AND SPECIFICATIONS**

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Tree planting needs to be supported by planting, priorities, requirements, procedures and specifications that provide for the consistent management of trees on public property.

## 1.0 PURPOSE

The purpose of this document is to make available in one reference all the various aspects of tree planting. The priorities, requirements, procedures and specifications outlined are to be adhered to when planting all public trees. They apply whether the work is performed by the City or contractually by private companies. Where a conflict exists with either the priorities, requirements, procedures or specifications outlined in this document, it is the responsibility of the proponent to justify the need for an exception and obtain written approval from the Director of Community Services.

## 2.0 SPECIES DIVERSITY

A major concern for the tree planting program is the need for species diversity. Diversity is an important element in the long-term health of the urbanforest. The effects of Dutch Elm Disease (DED) on Canadian cities is a tragic example of the need for species diversity. In December 1996, 36 per cent of Regina's public tree population is elm and 32 per cent ash. As a consequence they comprise 68 per cent of Regina's public trees.

Regina must proactively manage the species composition of its tree population to attain an acceptable species diversity. The following table shows the preferred species diversity percentage for parks and open space and residential sites.

**Table 1: Species Diversity**

<b>Parks &amp; Open Space</b>	
Number of Trees On Site	Maximum Percentage of Any One Genus
1 – 15	75%
16 – 50	50%
51 – 100	25%
100+	20%
<b>Residential Sites</b>	
Number of Trees at Site	Maximum Percentage of Any One Genus
1 – 15	100%
16 – 50	75%
51 – 100	50%
100+	25%

In general there should be no more than:

- 25 per cent of any one genus for the city as a whole.

- 25 per cent of any one genus per sector.
- 20 per cent of any one genus in each park.
- 30 per cent of any one genus on residential streets per sector.

Genus is defined as a category of biological classification ranking between the family and the species comprising structurally or genetically related species.

### 3.0 SPECIES SELECTION

Table 2 constitutes the official tree species list for the City of Regina. No species other than those included in this table may be planted on public land without the written permission of the Director of Community Services.

#### NOTES & CODES

<sup>1</sup> Open Space includes neighbourhood, zone and municipal parks; elementary and secondary school sites, golf courses and cemeteries, as well as the following Special Use Areas as defined in the Open Space Development Standards: buffer strips, pipeline ROW, utility parcels, flood plains, storm water channels/watercourses, storm water retention/detention areas and municipal reserves. The physical context of each open space, as well as the goals/purpose of the proposed planting must be taken into consideration in combination with the above guidelines, as every potential planting site has site specific constraints and opportunities with respect to the location, species, configuration and density of trees which may be used.

<sup>2</sup> All Elm species have been shown to be susceptible to Dutch elm disease (DED). The planting of all elms is subject to the Dutch Elm Disease Control Regulations as stipulated by the Province of Saskatchewan.

<sup>3</sup> Poplar species have shallow and aggressive root systems and are generally not as long lived as other hardwoods; however, they are fast growing. They are not to be planted within 15m of private property or hard surfaces such as asphalt, concrete or brick pavers.

[X] EXPERIMENTAL TREE: Trial only; requires protected site. Hardiness is questionable.

[P] PROBLEM TREE Silver Maple/Chokecherry - suckering

Manitoba maple produces an abundance of seedlings, has weak crotches and is a favourite of aphids which produce a sticky excrement that damages the surface of anything below. The cultivar Baron is a seedless male selection.

Siberian elm produces an abundance of seedlings, has weak crotches, and is generally high maintenance. However, it grows very quickly and is well adapted to a variety of conditions.

Mayday tree has a tendency to produce forking branches which cause branch splitting; is subject to attack from the forest tent caterpillar and aphids; and produces a very sticky fruit that is dropped when ripe.

[H?] HARDINESS CAUTION: Trees with this symbol are less hardy than others listed in the same grouping or site type and may require a protected micro-climate to survive.

[PS] PROTECTED SITE: Trees with this code should only be used in a protected site.

[ST] SALT TOLERANT: Trees with this code have a demonstrated tolerance to road salt.

[DT] DROUGHT TOLERANT: Trees with this code are likely to do better in unirrigated and/or exposed sites than those trees listed in the same category without the code. Only trees with this code should be used in unirrigated areas.

[IRR] Tree to be used in irrigated areas only.

CVs Cultivars

**Table 2: Tree Species and Site Suitability**

TREE TYPE		SITE SUITABILITY			
		OPEN SPACE <sup>1</sup>  Includes parks, schools, golf courses, cemeteries and special use areas.	STREET TREES		
			RESIDENTIAL STREETS / PUBLIC WALKWAYS	Turf Areas or Planting Beds on BOULEVARDS / MEDIANS (>10m WIDTH) & TRAFFIC ISLANDS (>75m5)	TREE WELLS/HARDSCAPE  (in hard surface areas such as sidewalks, plazas, ie: concrete, paving stone)
D E C I D U O U S  T R E E S	<b>SHADE TREES</b>	Ash species [DT] Birch species [IRR] Black walnut [X] [IRR] Butternut [X] [IRR] Elm species <sup>2</sup> Delta hackberry Horse chestnut [X] [IRR] Linden species Maple species Oak species Ohio buckeye[(X)] Poplar species <sup>3</sup> [DT] Russian Olive (PS) Willow species Honey Locust (X)	Ash species [DT] Bur oak [DT] Elm species [DT] Delta Hackberry Linden species	Ash species [DT] Bur oak [DT] Elm species [DT] Delta Hackberry[H?] Linden species Poplar species <sup>3</sup> [DT] Silver maple[H?]	Ash species [DT] Elm species [DT] Linden species
	<b>ORNAMENTAL TREES</b>	Mountain ash species Amur maple [DT] Cherry species [DT] Japanese tree lilac [DT] Rosybloom crabapples [DT] Russian olive [ST] [DT] >Snowbird= hawthorn [DT] Ussurian pear [DT] Mountain Alder (X)	American mountain ash Amur cherry Japanese tree lilac [DT] Mayday cherry [DT] [P] Rosybloom crabapples [DT] Schubert chokecherry [DT]	American mountain ash Amur cherry[H?] Amur maple [DT] Japanese tree lilac [DT] Mayday cherry [DT] [P] Rosybloom crabapples [DT] Schubert chokecherry [DT]	Japanese tree lilac [DT] Schubert chokecherry [DT]
<b>CONIFEROUS TREES</b>	Pine species [DT] Siberian larch [DT] [ST] Spruce species Sub-alpine fir Tamarack Douglas fir (X)	Scots pine [DT]	Colorado spruce [DT] Scots pine [DT] White spruce Norway Spruce	Scots pine [DT]	

Table 3 provides a more detailed description of the recommended species and cultivars.

**Table 3: Species and Cultivars**

GENUS	RECOMMENDED SPECIES and CULTIVARS
ALDER (Alnus)	'Mountain Alder'(X)
APPLE (Malus; ROSYBLOOM CRABAPPLE) (DT)	'Almey' (rose), 'Hopa' (purplish-pink), 'Kelsey' (purplish-red), 'Makamik', 'Pygmy' (deep purplish-red), 'Red Splendor' (light pink), 'Rudolph' (deep rose) 'Selkirk' (pink), 'Thunderchild' (pink), Radiant crab (X) 'Strathmore' (pink) (X), 'Snowdrift', (X)
ASH (Fraxinus) [DT] [ST]	Green ash [DT] [ST]+ CV=s/selections: >Patmore', >Bergeson', >Prairie Dome', >Autumn Blaze' White ash [X], Black ash+ CV=s: >Fallgold' , >Mancana' Manchurian ash, 'Prairie Spire', Northern Blaze
BIRCH (Betula) [IRR]	Chinese paper birch, Paper birch +CV=s: >Chickadee=, European birch
BUCKEYE (Aesculus)	Ohio buckeye Horse Chestnut
CHERRY (Prunus) [DT]	Amur cherry, Canada plum, Mayday tree [P], Pincherry [ST], Chokecherry [ST]+ CV: >Schubert=, Jumping Pound
ELM <sup>2</sup> (Ulmus) [DT] [ST]	American (White) elm, Siberian elm, Brandon elm.
Hackberry (Celtis)	Hackberry+ CV's: Delta
Hawthorne (Crataegus)	Hawthorne+ CV's: Snowbird, Toba.
LINDEN (Tilia)	American Linden, Little-leaf linden + CV=s: Greenspire/Norlin, Dropmore linden + CV=s: `Wascana', Mongolian linden, Boulevard (X),
MAPLE (Acer)	Amur maple, Manitoba maple [DT]+ CV=s: >Baron', Tartarian maple, Silver maple[H?] [DT] + CV=s: `Northline'[H?], Silver Cloud, Northwood; Norway maple [X] + CV=s: >Schwedleri'[X], >Crimson King[X], Sugar maple [X].
OAK (Quercus)	Burr oak [DT], Northern red oak[X], Mongolian oak[H?], Scarlet oak [X], White Oak
OLEASTER (Elaeagnus)	Russian Olive
PEAR (Pyrus) [DT]	Ussurian pear + CV: >Ure= [DT]
PINE (Pinus) [DT]	Scots pine, Lodgepole pine, Swiss stone pine, Jack pine [ST], Mugho pine, Ponderosa pine[H?] White Pine?
POPLAR (Populus) [DT]	European columnar aspen, Plains cottonwood + CV=s, Tower poplar, Northwest poplar, Russian poplar cultivars, Trembling aspen, Berlin poplar, Silver poplar[H?], Balsam poplar. Assiniboine poplar, Manitou poplar
SORBUS	Mountain Ash and CV's: American fastigata P, Rossica, Showy, European
SPRUCE (Picea) [DT]	Norway spruce, White spruce, Colorado (Blue) spruce [DT], Black Hills.
SYRINGA	Japanese tree lilac+ CV's : Ivory Silk
WALNUT (Juglans)	Black walnut (X), butternut (X).
WILLOW (Salix)	Laurel-leaf willow, Peach leaf willow [DT] [ST], White willow + CV=s: `Chermesina' (Red-barked white willow), `Sericea' (Siberian white willow), `Vitellina' (Golden willow) (X) 'Tritis' (Prairie Cascade)

## **4.0 TREE SPACING AND SETBACK REQUIREMENTS**

Listed below are the minimum distances required between trees and setbacks from various infrastructure elements. The Superintendent of Urban Forestry may consider alternatives to or relaxations of these requirements when the developer, contractor or their agents provide a written submission outlining the reasons for waiving the requirements.

### **4.1 Spacing Between Trees**

- Spacing between trees shall reflect the chosen species' ultimate width, the site conditions and design criteria.
- Spacing between crab apples, cherries (prunus), spruce, willows and any other ornamental tree species on residential streets - 8 meters.
- Spacing between shade trees such as maple, ash, elm, linden, willows, poplar and birch on residential streets - 10 meters
- Boulevard width for a single tree row - 6 meters
- Boulevard width for a double row of trees - 10 meters  
minimum from curb - 3 meters
- Back of walk residential street tree plantings - 1.5 meters minimum

### **4.2 Setbacks From Infrastructure Elements**

- The Public Works Department, Municipal Engineering Department and Urban Planning Division shall meet with The Urban Forestry Section prior to any major arterial plantings in order to establish an agreement on setbacks. Trees should be planted in accordance with the sightline controls described in Section 69 of *The Regina Traffic Bylaw No. 9900* and the safety considerations described in the Geometric Design Guide for Canadian Roads issued by the Transportation Association of Canada.
- Underground utilities – minimum 2 meters (sewer, water, gas lines, secondary cables – 240 volts and telephone lines)
- Major underground utilities - 5 meters (ie: main gas lines, primary cables – 14,000 volts and concrete ducts).
- Street light cables – 1 meter
- Concrete, asphalt driveways/sidewalks – setback should be sufficient to allow for the full spread of the

tree's canopy at maturity.

- Alleys - 4.5 meters
- Buildings or structures - same as tree spacing guidelines
- Street lights - 5 meters
- Regulatory traffic signs - 5 meters
- Fire hydrants/bus stops - 2 meters
- Overhead powerlines - 10 meters offset for trees that grow to a mature height of 10 meters  
- 5 meters offset for trees that grow to a mature height of less than 10 meters.
- Adjacent private property - 5 meters except poplars which are 10 meters
- Intersection curb -10 meters  
- In the vicinity of intersections a minimum vertical clearance to the canopy of 2.4 meters is desirable to provide clear sightlines for motorists.

#### **4.3 Trees Should Not Be Planted In The Following Areas**

- So as to obstruct the stopping sightline distance for motorists approaching a traffic sign or signal.
- So as to obstruct the clear line of sight of motorists or pedestrians approaching a street intersection or exiting a curb crossing, walkway or alley on the street. (See Schedule "H" *The Regina Traffic Bylaw No. 9900*).
- Large trees should not be planted in close proximity to vehicular traffic lanes such as within boulevards less than 2.0 meters and medians less than 4.5 meters in width.
- The use of coniferous trees which block sightlines for both drivers and pedestrians should be avoided in boulevard areas.
- Under canopies or overhead signs except for certain small species.
- In loading, taxi, bus, police or handicap zones.
- In storm channel floodways and stormwater swales/ditches and on top of flood protection dikes.
- On the reading side of regulatory signs ie: stop signs, no parking signs.
- In front of doorways, entrance walkways, show windows, unless spacing requirements permit.
- So as to obstruct parking meters.



- On major arterial roadways where the boulevard is less than 6 meters wide.

## 5.0 PLANTING PROCEDURES

It is essential that proper planting procedures be employed to protect the safety of employees and the City's investment in the urban forest.

- The safety of employees is important to the City. Employees must follow established safety requirements to minimize the chance of injury.
- The City maintains a significant investment in time, money, materials and equipment to produce and manage Regina's urban forest.
- Healthy plant materials are critical for successful urban forest growth. Unhealthy or damaged material is not likely to grow and mature into a healthy, vigorous tree.

### 5.1 Safety Requirements

All workers are required to follow the safety procedures outlined in Appendix "J" Safety Requirements.

### 5.2 Protection

The following requirements shall be adhered to when transporting and planting trees. (See Appendix "G" Tree Protection for a more detailed description of the requirements for protecting public trees.)

- Protect all plant material from damage and breakage. **Protect all parts of the plant material from drying out from the time of digging until the time of planting.**
- Ensure that transported plant material is adequately protected from sun and wind. Trees that are moved by truck shall be moistened with a gentle spray and covered with a tarp.
- Trees shall be planted immediately after removal from the nursery. All plants not installed by the end of the shift will be watered.

### 5.3 Marking the Site

- Usually the Forestry Technician marks the site. However, this task may be delegated.
- Leaflets describing trees to be planted and planting information are dropped off at all houses where residential planting is to occur.
- When marking a site, consideration must be given to the following factors:
  - existing trees/species of trees

- sightline bylaw
  - overhead power lines
  - utility setbacks (Call all companies locations prior to planting)
  - building and fence set back
  - street setbacks (signage)
  - street light and train utilities setbacks
  - bus stop setback
  - amenity setbacks (i.e. tennis courts, bench, playground)
  - private property setbacks
  - irrigation lines
  - water and service lines
- When marking tree holes, use one or a combination of the methods listed below:
    1. Spray Paint (pink)
      - convenient
      - will last 3 - 4 weeks when grass is not growing vigorously
      - does not work well if the site has no turf
      - use pink
      - use a mark such as an “X” to avoid confusion with utility locations
      - mark dot on sidewalk adjacent to the location.
    2. Stakes
      - convenient
      - visible from a distance
      - ideal in loamed areas
      - subject to removal by public
      - pose a potential hazard near play toys or athletic field

## 5.4 Tree Staking

Staking a tree may be required for the following reasons:

- To provide anchorage for roots while they become established.
- To maintain a trunk in vertical position.
- To provide support for the trunk and crown.
- To provide protection to the trunk.

A stake is used to support a tree, not to straighten a crooked one. In most cases, tree staking is not necessary with wire basket planting. However, if the tree will not support itself, staking will be required. The following procedures should be followed when staking a tree.

- Use steel stakes instead of wood.
- Stakes must be imbedded in firm ground.
- Stakes should not be put through the root ball.
- Stakes are to be tied to the tree at one-half to two-thirds of the tree’s height.
- Use a rubber hose on all guy wires to protect the tree at the point of contact.
- Three stakes are used to secure the tree (or guy wire).
- Put one stake on northwest side of the tree.

- Tree stakes can be removed after two years.

## 5.5 Watering

Trees shall be watered immediately after planting. Water must be applied slowly to avoid creating air pockets and eroding soil from the roots. Tree wells shall be made to hold water. They shall be no larger than the circumference of the tree spade hole and maintained for a minimum of one year regardless of whether the planting is in an irrigated or unirrigated site.

## 5.6 Planting Procedures

The City currently uses four procedures for planting trees.

- 5.6.1 Wire Basket
- 5.6.2 Hand Plants
- 5.6.3 Tree Spade
- 5.6.4 Contract Planting

### 5.6.1 Wire Basket

This procedure refers to dormant trees that are dug by tree spade or a tree baller and placed into wire baskets. Basketing of trees is done at the nursery by nursery staff or by the supplier. Wire basket trees are usually larger trees with a caliper of 50 mm to 100 mm.

Procedures

- 1) **Confirm** arrangements for delivery or pick-up of trees from the nursery through supervisor.
- 2.) **Ensure** you bring a proper invoice or requisition (completed and authorized) to the nursery to pick up trees for that day's planting.
- 3) **Open** prepared tree holes by tree spade or shovel as indicated on the tree planting map.
- 4) **Place** the tree ball in the open hole at the same height as it was in the nursery and **PLUMB** the tree straight.
- 5) **Remove** the top ring of the basket and cut the second ring in three or four places. **Don't leave sharp edges.**
- 6) **Remove** all strapping and burlap from around the base of the tree trunk. To prevent wicking, burlap must be either cut off or peeled back below the soil surface from the top one-third of the root ball.
- 7) **Backfill** around tree root ball and tamp. (Root ball should be 100 mm to 150 mm below surrounding grade and add topsoil). Avoid creating air pockets.
- 8) **Form** the tree well.
- 9) **Stake** the tree if necessary (see staking detail).

- 10) **Arrange** for watering immediately. If it is necessary to fertilize in the first year for example due to poor soil conditions, a fertilizer formulated to suit the soil condition should be used to prevent damage to the tree roots.
- 11) **Recheck** backfilling and add loam where necessary following waterings.
- 12) **Remove** or prune broken branches.
- 13) **Clean** up site.
- 14) **Record** all plantings as they are completed in the tree inventory.

### 5.6.2 Hand Plants

Hand plants are trees primarily dug at the nursery by nursery staff that are bare root in their dormant stage. They are usually smaller trees with a caliper of 25 mm - 50 mm.

#### Procedures

- 1) **Confirm** arrangements for delivery or pick-up of trees from the nursery through your supervisor. All bare root maintenance is to be tarped during transportation and on site when planting.
- 2) **Ensure** you bring a proper invoice or requisition (completed and authorized) to the nursery to pick up trees for that day's planting.
- 3) **Open** prepared tree holes by auger or a sharp shovel as indicated on the tree planting map. Score holes where an auger or spade is used. The tree hole must be larger than tree roots. Do not cut the tree's roots to fit the hole.
- 4) **Prune** off all damaged roots and branches before planting.
- 5) **Spread** out roots in the hole. Holes should fit the tree roots not vice versa. If necessary, enlarge the hole to accommodate the roots. Do not bend or cut roots to fit hole.
- 6) **Hold** the tree trunk in a vertical position while the helper backfills the tree hole. Top soil shall be used to backfill the hole. While the tree is being backfilled, the person holding the tree shall gently shake the tree up and down to settle loam around the tree roots. Tamp the loam frequently to remove air spaces being careful not to damage the roots. Care must be taken to ensure the tree is planted at the same soil level as it was grown in the nursery. The final soil level in the tree well must be 100 mm - 150 mm below the surrounding grade.
- 7) **Form** the tree well (minimum 150 mm depth and 1 meter diameter).
- 8) **Stake** tree (steel stakes).
- 9) **Arrange** for watering immediately (fertilize if necessary).

- 10) **Recheck** backfilling and tree well, adding loam where needed.
- 11) **Clean** up site.
- 12) **Record** all plantings as they are completed.

### 5.6.3 Tree Spade

This method utilizes a tree spade to perform all the functions of tree planting – 1) digging up the tree, 2) digging the hole to plant it in and 3) planting the tree in the hole.

#### Procedure

1. **Locate** all utilities and follow proper setbacks from these utilities (see “Utility Markings”).
2. **Plant** the tree. (See Section 6.0 Planting Specifications).
3. **Stake** the tree if necessary. Conifers are to be protected from rotation by staking or guying depending on the size of the tree and the context of the site.
4. **Water** the tree and fertilize if necessary.

### 5.6.4 Digging With A Tree Baller and Tree Spade

The following tables show the appropriate size of tree baller or tree spade to be used in relationship to the size of the tree.

**Table 4: Tree Digging With A Tree Baller – Size Relationships**

<b>BALLER SIZE (CENTIMETERS)</b>	<b>TRUNK DIAMETER DECIDUOUS TREES (CENTIMETERS)</b>	<b>HEIGHT OF CONIFEROUS TREES (METERS)</b>
61	Up to 4 cm.	Up to 1.5 m
71	4 to 6 cm	1.5 to 1.8 m
81	6 – 8 cm	1.8 to 2.4 m
91	8 - 10 cm	2.4 to 3.0 m

\* Greater than 3 meters refer to Table 5 below.

**Table 5: Tree Spade Transplanting – Size Relationships**

<b>TREE SPADE SIZE (CENTIMETERS)</b>	<b>TRUNK DIAMETER DECIDUOUS TREES (CENTIMETERS)</b>	<b>HEIGHT OF CONIFEROUS TREES (METERS)</b>
112	Up to 8 cm	Up to 2.1 m
137	8 to 11 cm	2.1 to 3.0 m
152	8 to 13 cm	2.1 to 3.7 m
213	13 to 20 cm	3.7 to 6.1 m

Note 1: Trunk diameter is measured at caliper (diameter): 15 centimeters above the ground for trees 10 centimeters in diameter or smaller; and 30 centimeters above the ground for trees with diameters greater than 10 centimeters.

Note 2: The tables shown above are guidelines to consider when matching tree size to tree spade or tree baller size. The tree size may be increased depending upon the individual species needs and the season of transplant.

### **5.6.5 Contract Planting**

Contract planting is usually used for prearranged projects. The contractor has signed a contract with the City of Regina and is only required to do what is in the contract as per the Tree Planting Priorities, Requirements, Procedures and Specifications. In contract planting, it is necessary to thoroughly understand the relevant parts of the contract that define the duties and responsibilities of the City of Regina Community Services personnel and the contractor.

### **5.6.6 Key Points to Remember**

- 1) Inspect all trees prior to planting. Inform your supervisor if you notice any of the following:
  - die-back of main branches
  - signs of insect and disease problems
  - discoloration of bark and shrivelled branch texture
  - signs of poor or damaged root system
    - wire basket not firm - loose root ball
    - tree trunk moves independently of root ball
    - root ball is very dry
- 2) Spade trees are staked for one year, ball and burlap trees for two years. Stakes are colour coded annually as per Forestry colours.
- 3) Watering personnel shall check each site within a few days of planting for:
  - leaning trees
  - exposed roots
  - soil settling
  - moisture
  - stakes and ties
  - string around the trunk
  - broken branches

## **6.0 PLANTING SPECIFICATIONS**

The following planting specifications are intended to provide a consistent city method for planting trees.

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