

# HELENA ARBORICULTURAL STANDARDS

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URBAN FORESTRY PROGRAM  
HELENA PARKS AND RECREATION

*(updated May 2016)*

## Table of Contents

Section 1. Introduction.....	3
Section 2. Definitions.....	3
Section 3. Permits and Licenses.....	4
Section 4. Tree Removal Standards.....	5
Section 5. Tree Pruning Standards.....	7
Section 6. Tree Planting Standards.....	8
Section 7. Acceptance Criteria for Nursery Trees.....	11
Section 8. Protection of Trees during Construction.....	12
Section 9. Approved and Restricted Tree Species List.....	13
Section 10. Other Tree Maintenance Standards.....	13
Fertilization and cabling/bracing	
Section 11. References.....	14

## Section 1: Introduction

The Arboricultural Standards for the city of Helena contain the regulations and standards for the removal, pruning, planting and other maintenance of trees on public property. The purpose of the manual is to provide a detailed guide of proper arboricultural practices for developing and improving the tree resources of the community. The manual is to be used by city staff, arborists, property owners, engineers, landscape architects, urban planners, private tree service companies and others to ensure compliance with the city of Helena Boulevard Landscaping and Tree Ordinance.

The Boulevard Landscaping and Public Tree Ordinance provides the legal basis for the development of an Arboricultural Standards manual for the proper care of trees in our community.

All work done on city-owned trees shall be performed in accordance to the latest revision of the American National Standards Institute Standard Z-133.1, Safety Requirements for Pruning, Trimming, Repairing, and Maintaining Trees, copy of which is on file with the Parks and Recreation Director.

The Helena Arboricultural Standards Manual (HAS) shall be adhered to at all times but may be modified by the city at any time to address new research, improved methods, new laws or other circumstances that make it advisable. Exceptions to the (HAS) manual must have written approval of the Parks and Recreation Director or designee.

## Section 2: Definitions

**ANSI A300 standards** – industry-developed standards of practice for tree care; acronym for American National Standards Institute

**ANSI Z133.1** - safety standards for tree care operations

**Arboriculture** - the study of trees and other plants

**Arborist** - an individual engaged in the profession of arboriculture who, through experience, education and related training, possesses the competence to provide for or supervise the management of trees and other woody plants

**Backfill** - soil put back into a hole when planting a tree.

**Balled and burlapped**- having the root system and soil wrapped in burlap for moving and planting a tree or other plant

**Bare root** - tree or other plant taken from the nursery with exposed root system, without soil

**Best Management Practices** - best available industry-recognized course of action, in consideration of the benefits and limitations, based on scientific research and current knowledge

**Bracing** - installation of metal rods through weak sections or portions of a tree for added support

**Branch bark ridge** - raised strip of bark at the top of the branch union, where the growth and expansion of the trunk or parent stem and adjoining branch push the bark into a ridge

**Branch collar** - area where a branch joins another branch or trunk created by overlapping wood tissues

**Cabling** - installation of hardware in a tree to help support weak branches or crotches

**Central leader** - the main stem of a tree

**City** - The city of Helena, Lewis and Clark County, state of Montana

**Codominant branches/stems** - branches or stems arising from a common junction having nearly the same size diameter.

**Critical Root Zone (CRZ)** - area of soil around a tree trunk where roots are located that provide stability and uptake of water and minerals required for tree survival

**Crown**- the above-ground portions of a tree.  
**Deadwooding** - removal of dead or dying limbs from a tree  
**Decay** - decomposition of woody tissues by fungi or bacteria  
**DBH** - diameter at breast height, typically measured at 4.5 feet above ground level  
**Internode** - the region of the stem between two successive nodes  
**Leader** - the primary terminal shoot or trunk of a tree  
**Lion tailing** - the poor pruning practice in which the limbs are thinned from the inside of the crown to a clump of terminal foliage  
**Node** - the slightly-enlarged portion of a stem where leaves and buds arise  
**Parks and Recreation Director** - The designated official for the city of Helena assigned to carry out the enforcement and intent of this chapter  
**Pruning** - cutting away unwanted parts of a plant.  
**Shall** - as used in this standard, denotes a mandatory requirement.  
**Should** - as used in this standard, denotes an advisory recommendation.  
**Species** - a group of organisms composed of individuals of the same species.  
**Sprout/water sprout** - new shoots originating from epicormic or adventitious buds. Not to be confused with “suckers”.  
**Staking** - supporting a newly-planted tree or a leaning tree with stakes and ties.  
**Structural defects** - flaws, decay or other faults in the trunk, branches or root collar of a tree that may lead to failure of the tree.  
**Sucker** - shoot arising from the root of the tree.  
**Topping** - reduction in tree size using intermodal cuts without regard to tree health or structural integrity. Topping is not an acceptable pruning technique.  
**Tree Protective Zone (TPZ)** - defined area within which certain activities are prohibited or restricted to prevent or minimize potential injury to designated trees, especially during construction and development.  
**Trunk Flare** - area at the base of the plant’s stem or trunk where the stem or trunk broadens to form roots, also referred to as the area of transition between the root system and the stem of the trunk.

## Section 3: Permits and Licenses

### Permits:

Permits are required for planting, major pruning and removal of trees on any city-owned property as provided in 7-10-4 of the Boulevard Landscaping and Public Tree Ordinance. A permit is required for each work site address, and all work sites are subject to pre-and post-work inspections to approve work procedures. The person residing at the address of the work site shall initiate the permit process but can hire an approved contractor to complete the work.

All equipment to be used and all work to be performed must be in full compliance with the most current revision of the American National Standards Institute standard Z-133 and A300 as amended.

Permit application forms can be obtained at 316 North Park Avenue, Helena, MT 59623 or by calling 406-447-8463 or online <http://www.helenamt.gov/parks/urban-forest-management.html>. Completed applications shall be submitted to Helena Parks and Recreation Department, 316 North Park Avenue, Helena, MT 59623. The property owner will be notified

after the application is processed, the work site is inspected and the Director of Parks and Recreation or designee approves the application.

### **Commercial tree license:**

Any person retained to perform major pruning on a public tree or removal of an established boulevard tree (over 3 years at location) must be licensed to perform commercial tree work by the city of Helena unless such person is supervised by the holder of a license.

A license to perform major pruning is issued to each applicant who meets the following qualifications:

1. is, or has an employee who is, an arborist certified through the International Society of Arboriculture
2. has not been found in violation of any requirements of this chapter
3. maintains liability insurance in the amount established by the city

The city of Helena may revoke the license when the licensee commits any of the following acts or omissions:

1. knowingly violates any of the provisions of this chapter or any part of the specifications established in Helena Arboricultural Specifications and Standards
2. revocation shall be for a period of one year for first violation, three years for second violation and permanent for third violation

## **Section 4: Tree Removal Standards**

The Parks and Recreation Director or a designee may authorize, deny or order removal of or may remove trees and shrubs on public property whenever one or more of the following criteria are met. These standards guide removal for city staff and permit holders.

1. any dead or dying tree
2. any otherwise healthy tree that harbors insects or disease that could pose a risk to adjacent trees
3. any tree determined to be a high risk to fail as determined by evaluation from an ISA certified arborist using the ISA twelve-point hazard rating system
4. any tree that creates an ADA obstacle that cannot be mitigated

The removal of a public tree for the purposes of accommodating private facilities will not be permitted unless the following conditions have been met:

1. There is no reasonable design alternative for mitigation.
2. The property owner shall compensate the city for the loss of the tree(s) prior to removal based on the latest edition of "Guide for Plant Appraisal" by the Council of Tree and Landscape Appraisers published by the International Society of Arboriculture.
3. The city determines that the removal is beneficial in terms of meeting objectives identified in the Helena Urban Forest Management Plan such as diversifying species composition and removing trees that could be a public safety risk.

### **Street Closures and Traffic Control**

1. Blocking of public streets shall not be permitted unless prior arrangements have been made with the city of Helena engineering department.
2. The permit holder shall provide adequate barricades, signs and/or warning devices during the performance of the tree removal to protect tree workers, motorists and pedestrians. Placement of cones, signs, and barricades must conform to the American Traffic Safety Standards.

### **Site Clean up**

1. The permit holder shall clean up the site and remove and dispose of all debris at the end of each day. Site cleanup shall include removal of sawdust, twigs, chips, leaves, trunks and limbs from the street, curb, boulevard, sidewalk, private lawns and driveways with the appropriate tools. The site shall be returned to the same state it existed prior to removal.
2. Disposal of all logs, limbs, chips and debris generated by work shall be the responsibility of the permit holder. If residents request chips, logs or branches, they must be left on private property and not the boulevard.
3. Limbs and trunks temporarily placed in the boulevard shall be placed in such a manner as to eliminate any obstruction to motorists or pedestrians. Under no circumstances shall materials be left on the boulevard overnight.
4. All infectious disease trees or parts of trees possibly harboring vectors of infectious disease shall be removed, and it shall become the permit holder's responsibility to ensure destruction of the diseased or dead wood in accordance with the state statutes and local ordinance. Under no circumstances shall logs from infectious disease trees be left for the homeowners.

### **Protection of Property**

1. The permit holder shall take all necessary precautions to eliminate damage to adjacent trees, shrubs, lawns, curbs, walks and other public and private property. Holes or damage to lawns and boulevards shall be filled with native top soil and seeded with a turf grass lawn seed mix unless specified differently.
2. Sidewalks, curbs, streets, irrigation facilities and manhole structures shall always be protected from impact of falling wood by use of the tree or limb ground supports. Rope or other mechanical devices shall be used to lower limbs that could cause damage to private or public property.

### **Protection of overhead utilities**

Removal operations may be conducted in areas where overhead electric, telephone and cable television facilities exist. The permit holder shall protect all utilities from damage, shall immediately contact the appropriate utility if damage should occur and shall be responsible for all claims for damage due to the permitted operation.

### **Removal of stumps**

The permit holder shall remove all tree stumps and buttress roots to a point twelve inches (12") below the adjacent ground level. The permit holder shall remove sufficient subsurface roots so that the grade is level with the adjacent ground.

Stump grinding chips and debris must be removed and disposed of within 24 hours of grinding the stump. Stumps should be removed within 6 months of the tree removal.

### **Backfilling**

All areas where stumps have been removed and areas disturbed by the removal operations shall be backfilled to the level of the adjoining grade with quality topsoil the same day the stump is removed. If the hole is not filled the same day, the hole must be properly barricaded overnight to ensure public safety. Stump grinding debris shall not be used as backfill material, and topsoil shall be native, free of roots, rocks, subsoil, debris, weeds and foreign material.

### **Seeding**

All disturbed areas and areas where backfill material was installed shall be seeded with a mixture that is consistent with the adjacent area.

## **Section 5: Tree Pruning Standards**

These guidelines are presented as working guidelines, recognizing that trees are individually unique in structure, growth and form. The appropriate guidelines should be chosen and/or modified depending on species, age, of the tree, time of year, condition of the tree and the management objectives. These standards guide pruning for city staff and permit holders.

1. All equipment used and all work to be performed must be in full compliance with the most current revision of the American National Standards Institute Standard Z-133.1-2000 and A300-2000 or as amended.
2. All final cuts shall be made sufficiently close to the trunk or parent limb without cutting into the branch collar or leaving a protruding stub. Excessively deep flush cuts that produce large wounds or weaken the tree shall not be made. Sharp pruning tools shall be used so clean cuts will be made at all times. All trees six inches or less in diameter shall be pruned with hand or hydraulic pruning tools only.
3. On branches that are too large to physically handle, it is necessary to use the three step cutting technique to prevent splitting or peeling of bark (See Figure #1)
4. If necessary, to prevent tree or property damage, branches shall be lowered to the ground by proper ropes and equipment.
5. On trees known to be diseased, tools are to be disinfected with methyl alcohol at 70% or 10% bleach solution after each cut and in between trees where there is a known danger of transmitting the disease on tools.
6. Equipment that will damage the bark and cambium layer shall not be used on or in any tree.
7. Climbing spurs shall not be used when climbing trees except to climb a tree that will be removed or to perform an aerial rescue of a worker.
8. Ropes shall not come in direct contact with the crotch of the tree when tied into the tree. Friction or cambium savers are to be used when accessing and climbing the tree with rope and saddle. Rope injury from loading heavy limbs should be avoided.

9. Dead branches greater than .5 inches measured at the base of the branch shall be removed from the canopy of all trees.
10. No more than 25% of live foliage should be removed.
11. A pruning cut that reduces the length of a branch or parent stem shall be made at a slight downward angle relative to the remaining stem and not damage the remaining stem. (See Figure 1)
12. Topping and lion's tailing are unacceptable pruning practices for Helena trees.

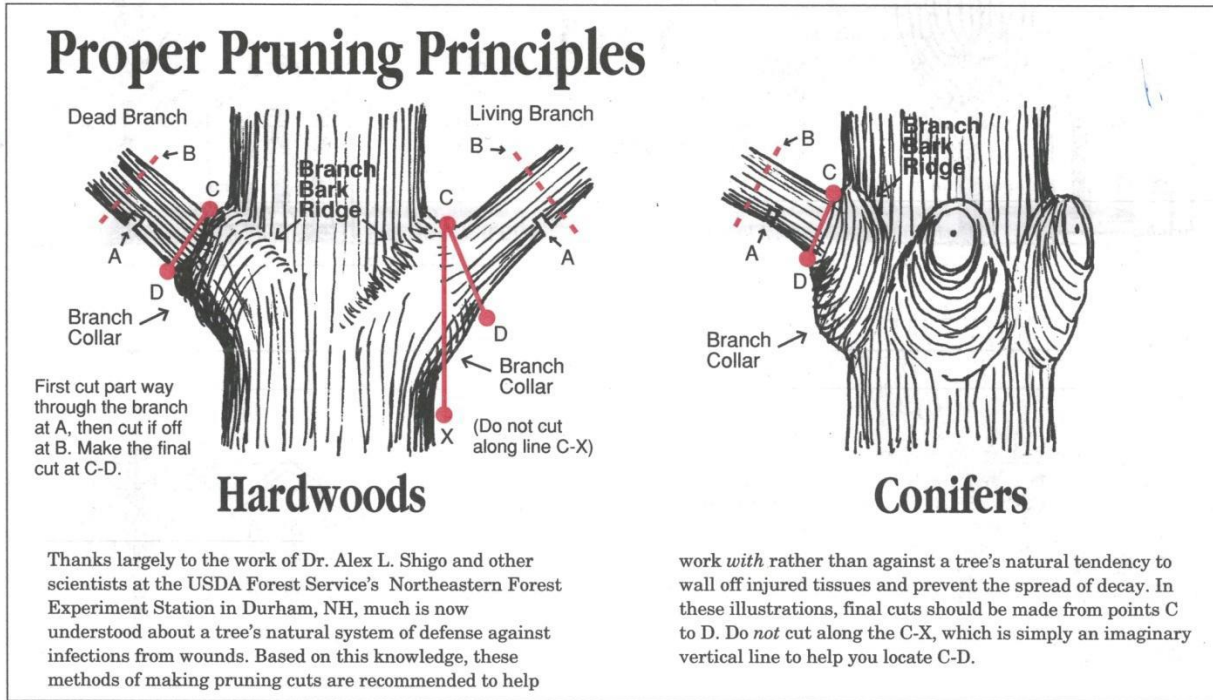


Figure 1

## Section 6: Tree Planting Standards

Planting the right tree in the right place is an investment in the future, and choosing the right tree in the right place will help produce healthy productive trees that require less maintenance. Tree species selection shall consider site use, public safety, size of mature tree, overhead and underground utility lines and future conflicts with sidewalks, curbs, sewer and septic systems. Another primary consideration shall be the environmental needs of species regarding hardiness, light, soil and water requirements.

Good tree selection should accommodate site use and public safety needs without compromising other infrastructure improvements. When choosing and planting a tree, the following criteria shall apply. These standards guide planting for city staff and permit holders.

1. The minimum caliper (trunk diameter) for boulevard planting is 1.5 inches.
2. Tree planting in proximity to intersections is governed by the sight distance triangle requirements of Helena City Code § 7-3-7.



3. Trees shall be placed to minimize future conflicts with driveways, street lights, street signs and utility poles. The appropriate distance will depend on the type of tree and other attributes of the planting site.
4. No tree other than those designated as class 1 shall be planted under overhead utility lines.

### **Tree classes with spacing requirements**

**Class I:** Ultimate height to thirty feet (30'), spacing approximately twenty to thirty feet (20-30'); for use where boulevard width is three feet (3') to six feet (6') or where there are overhead utility lines.

**Class II:** Ultimate height forty feet (40') to seventy five feet (75'), spacing approximately thirty to forty feet (30-40'); for use where the boulevard width is greater than six feet (6'), or where there are no overhead utility lines

**Class III:** Ultimate height seventy five feet (75') or over, spacing approximately forty feet (40') to fifty five (40-55'); for use where parkway width is eight feet (8') or greater, or where there are no overhead utility lines.

**Note:** Replanting of trees on existing boulevards may require a variance to the spacing specifications. Variances to the spacing requirements will be determined on a case by case basis through the tree planting permit application process.

### **Standards for planting**

All work will be done according to the ANSI A300 Part 6 –planting and transplanting standards.

**NOTE: ALWAYS LOCATE UTILITIES PRIOR TO EXCAVATING.** Call: 1-800-424-5555 (or 811).

1. Carefully remove soil at top of container to inspect the trunk flare and check roots for damage.
2. If the tree is acceptable, remove the tree from the container. Measure from the trunk flare to the bottom of the root ball. This measurement less one inch yields the depth of the center of the planting hole. **The roots must be kept moist at all times.**
3. Excavate the hole according to measurements taken in step 2.
4. If a tree spade is used, damage shall be avoided to roots and trunks. The spade must be free of fluids must be maintained and operated according to manufacturer's specifications.
5. Shave and discard grass and weeds from the planting site.
6. If possible the hole shall be three times the diameter of the container. Hole size will vary with the width of the boulevard and other environmental factors.
7. Prepare the root ball. Loosen and straighten outside and bottom roots prior to placing the root ball in the hole. The root ball (where the trunk meets the roots) may be up to 1 inch above ground level.

8. Winding and girdling roots must be pruned to either the point they are perpendicular to the root ball, or a point where they can be straightened and placed perpendicular to the root ball.
9. Hold the tree so the trunk and central leader are in a straight upright position and add back fill around the pedestal.
10. Backfill the hole with removed soil. Fill the entire hole level with existing soil grade. Backfill soil must not be placed on top of the root ball.
11. Build a berm 3 inches high by 3 inches wide at the outside edge of the root ball.
12. Cover the remainder of the backfill soil in the excavated area outside the berm with 4 inches of organic mulch or wood chips.
13. Install two stakes on the windward and leeward side of the tree set at least two feet into the native soil outside the root ball. Windy or high traffic areas may require 3-4 evenly spaced stakes.
14. One tie per stake must be placed at the lowest point on the trunk where the tree crown stands upright. Ties must be placed using a figure 8 crossing pattern wrapped around the trunk and firmly attached to the stake. Ties must be loose enough so the tree crown moves up to three times the trunk diameter in the wind and taut enough that the tree trunk does not rub the stakes during movement.
15. Apply water using a low pressure application, trickle from a hose or soaker hose. Saturate the root ball and planting area. Lawn sprinklers are not considered an acceptable method of applying irrigation to newly-planted trees.
16. Irrigation must be continued for at least the first three years after planting and should be continued for the life of the tree. Soil moisture must be monitored to adjust irrigation frequency during various times of the year.
17. Protect the tree trunk. Avoid damage from mowers, string trimmers and wildlife by installing tree guards. Maintain an area around the trunk that is free of vegetation and add mulch to cover the excavated area of the planting hole.
18. Prune newly-planted trees by removing dead wood, identifying a central leader and removing codominant leaders.

# Proper Tree Planting Diagram

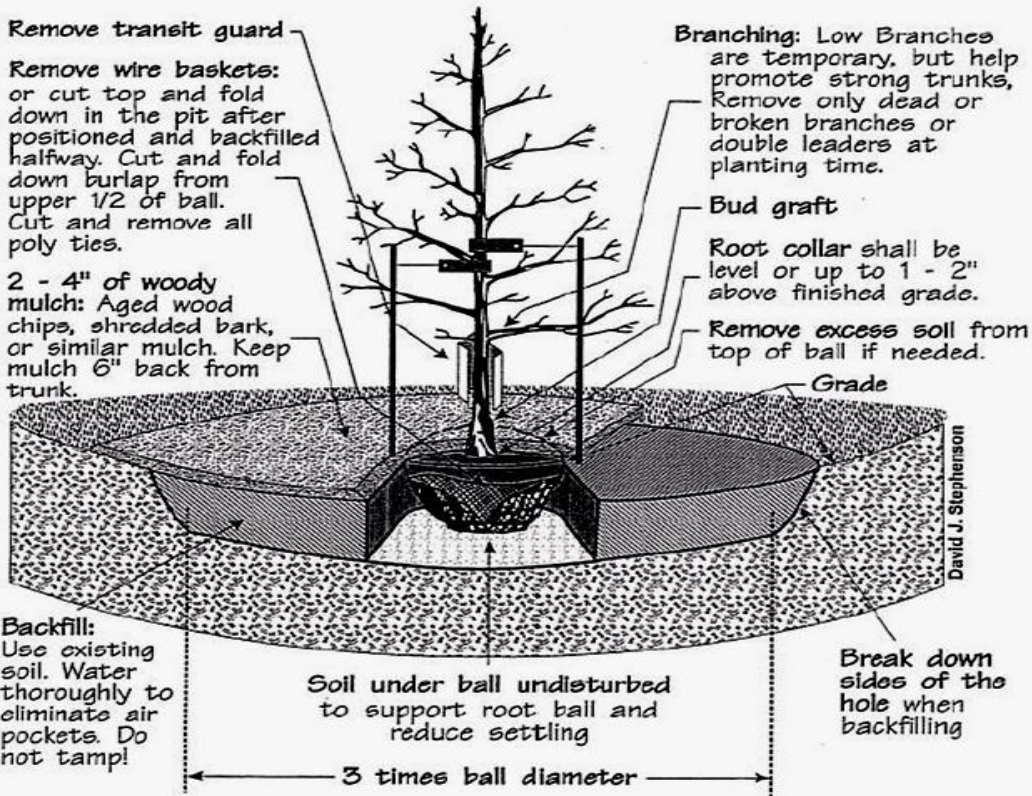


Figure 2

## Section 7: Acceptance Criteria for Nursery Trees

1. All trees accepted from a nursery or other source must be accurately identified and labeled with species.
2. All trees must comply with federal and state laws and regulations requiring inspection for plant disease, pests and weeds.
3. Trees are to be grown (when applicable) and grade according to ANSI Z60 Nursery Stock Standards.
4. The form and density of the crown must be typical for a young specimen of the species/cultivar.
5. Trees must have a single, relatively straight trunk and central leader. Trees must be free of codominate stems and vigorous upright branches that compete with the central leader.
6. Main branches must be well distributed along the central leader, not clustered together. The branches must form a balanced crown.
7. Branch diameter must be no larger than two-thirds (one-half is preferred) the diameter of the central leader measured 1 inch above where the branch is attached.
8. The tree trunk must be relatively straight, vertical and free of wounds, except properly made pruning cuts, which must be closed over or less than  $\frac{3}{4}$  inch (2 cm) diameter open. Trees with signs of conks, wood cracks, bleeding areas, signs of boring insects, galls, cankers, stem girdling ties or lesions from mechanical injuries will not be accepted.
9. Trunk caliper and taper must be sufficient so that the tree will remain vertical without a stake.

10. The root system must be substantially free of injury from biotic (e.g., insects and pathogens) and abiotic (e.g., herbicide toxicity and salt injury) agents.
11. The uppermost roots or root collar must be within the upper 2 inches (5 cm) of the soil media. Roots on the periphery and bottom of the root ball must be less than ¼ inch in diameter while 1/8 inch is preferred.
12. The tree must be well rooted in the soil media. Root distribution must be uniform throughout the soil, and the root structure and growth must be appropriate for the species/cultivar.
13. Field-grown trees for balled and burlap delivery must have the roots pruned at least 6 inches inside the final root ball size performed within adequate time for the tree to develop fibrous roots at the outer edge of the root ball prior to harvest and delivery.
14. The size, color and appearance of leaves must be typical for the time of the year and stage of growth of the species. Trees must not show signs of prolonged moisture stress as indicated by wilted, shriveled or dead leaves.
15. Branch growth (length and diameter) throughout the crown must be appropriate for the age and size of the species. Trees must not have dead, diseased, broken, distorted or otherwise injured branches.
16. Trees should have the appropriate hardiness to grow well in the environmental conditions found in the Helena area, and stock should be sourced from within the state or from an area with a similar climate.

## **Section 8: Protection of Trees during Construction**

Construction damage and development are some of the most common causes of tree death and decline in urban areas. Existing and future trees and shrubs should be conserved and integrated during site planning and construction for a variety of reasons including economic, social, environmental and cultural factors.

Plans should be made to avoid the most common types of injuries to trees including root cutting or damage, soil compaction, mechanical injuries to trunks, major roots or crown and covering the root collar of the tree with fill soil.

### **PROTECTION AND PRESERVATION STANDARDS**

Tree preservation efforts shall comply with the Boulevard Landscaping and Public Tree Ordinance and as outlined by the following criteria.

1. The Parks and Recreation Director or designee shall review all projects involving tree(s) on public property when the project is conceived and continue through the planning, design, construction and maintenance phases. Decisions to preserve, plant and remove specific trees can be discussed and determined at the same time decisions are made regarding site layout, grading requirements and construction techniques.
2. For specific recommendation consult "Managing Trees During Construction" which is a companion publication to the ANSI A300 Part 5: Tree, Shrub, and Other Woody Plant Maintenance-Standard Practices (Management of Trees and Shrubs During Site Planning, Site Development and Construction). On file at Helena Parks and Recreation Department.

## Section 9: Approved and Prohibited Tree Species List

Only deciduous trees with a single trunk are allowed in boulevards. Preferred boulevard trees will be hardy to this climate, tolerant of salt and road pollution, do not drop fruit, have sturdy branches and are not shallow rooted. The current list of permitted species and prohibited species is below and will change as new species are either determined to be suitable for the Helena area or determined to be detrimental. **Use of other trees is not discouraged but must be approved through the permit process.**

### Trees permitted for boulevards in the Helena area

<u>CLASS</u>	<u>COMMON NAME</u>	<u>BOTANICAL NAME</u>
I	Canada Red Chokecherry	Prunus Virginiana
I	Rocky Mountain Maple	Acer glabrum
I	Tatarian Maple	Acer tataricum
I	'Spring Snow' Crabapple	Malus spp. 'spring snow'
I	Fleshy Hawthorn	Cretaeagus succulent
II	Discovery Elm	Ulmus davidiana var. japonica
II	'Morton Glossy' Elm	Ulmus glabrax Triumph cv. 'Morton Glossy'
II	American or Elm Hybrid	Ulmus Americana or Ulmus x (accolade, new Horizon, triumph, cathederal, *valley forge, harmony, Brandon, autumn gold) <b>Dutch elm disease resistant</b>
II	Common Hackberry	Celtis occidentalis
II	Ohio Buckeye	Aesculus glabra
II	Thornless Honeylocust	Gleditsia triacanthos *'northern acclaim'
II	Amur Maackia	Maackia amurensis
II	American Linden	Tilia Americana
II	Little leaf linden	Tilia cordata
II	Norway Maple	Acer platanoides *'helena'
II	Bur oak	Ouercus macrocarpa
III	Red Maple	Acer rubrum

\*denotes a preferred variety

(updated May 2016)

For information regarding class descriptions and recommended spacing, see **Section 6: Tree Planting Standards, Tree classes with spacing requirements.**

### Trees not permitted for boulevards in the Helena area

<u>COMMON NAME</u>	<u>BOTANICAL NAME</u>
All Cottonwoods, poplars and aspen	Populus spp.
Silver maple	Acer saccharinum
All Willows species	Salix spp.
All Birch species	Betula spp.
Russian Olive	Elaeagnus angustifolia
All Conifer Species	Various
All multi stemmed species	Various

## **Section 10: Other Tree Maintenance Standards**

### **1. Fertilization**

Tree fertilization shall be done in accordance with ANSI 300 (part 2)-1998 standards and specifications.

### **2. Cabling and Bracing**

The installation of cabling and bracing tree support systems is a specialized practice in the field of arboriculture. Proper training and field experience are necessary to perform these treatments successfully and without damaging the tree. These treatments shall be done in accordance with ANSI 300 (part 3)-2000 standards and specifications.

### **3. Spraying**

Suitable precautions shall be taken to protect and warn the public that spraying is being done to public trees. Spraying will be done only for control of specific diseases or insects, with proper materials in the necessary strength and applied at the proper time to obtain the desired control. All spraying practices shall conform to federal, state and local regulations and must be performed by a licensed pesticide applicator.

## **Section 11: References**

- American National Standards Institute Z133.1-2000; A300 (part 1 through 5)
- Arbor Day Foundation, 100 Arbor Avenue, Nebraska City, NE 68410
- Arboricultural Specifications and Standards of Practice for the City of Spokane August 2002
- Arboricultural Specifications Manual, Third Revision-January 2011. Village of Howard Wisconsin
- City of Bozeman Tree Guide. Choosing trees for public spaces. City of Bozeman Forestry Division
- City of Moscow, Arboricultural Specifications and Standards Guide. January 2005
- International Society of Arboriculture (ISA) Best Management Practices for Tree Pruning 2008, Managing Trees during Construction 2008, Tree inventories, Tree Planting and Tree Support Systems
- Guide for Plant Appraisal “by the Council of Tree and Landscape Appraisers” published by the International Society of Arboriculture
- Putting Down Roots, Selecting the Right Tree for Your Helena Home. 2002 Growing Friends of Helena
- Trees for Townsend, A gift for future generations. 2002