1. PURPOSE

To identify and establish policies and procedures committed to proper planting, maintaining, protection, conservation, and removal of trees on UNR Campus, that are universally understood and practiced by developers, contractors, faculty, staff, and students; which contribute to enhanced aesthetics, environmental awareness, safety, sustainability image, and identity or “sense of place.”

To promote the mission of the UNR Arboretum Board to plan university landscape, conduct research, and educate the public.

2. RESPONSIBLE AUTHORITY/DEPARTMENT

The Campus Tree Care Plan for University of Nevada, Reno (UNR) will be handled by Grounds Services under the auspices of Facilities Services, which reports to the Vice President of Finance. The point person is the Assistant Director of Grounds Services.

3. CAMPUS TREE ADVISORY COMMITTEE

The UNR ARBORETUM BOARD is our CAMPUS TREE ADVISORY COMMITTEE

Terms: Members of the UNR Arboretum Board serve for one year, renewable. Officers--chair, vice chair, treasurer--are elected and serve for three years.

ROLES OF REPRESENTATIVES

The committee’s mission is to plan university landscape, conduct research, and educate the public. In practice, the committee works with UNR Grounds to initiate and plan tree-planting and garden projects. The committee advises Facilities on the landscape plan for new construction. The committee organizes campus and community outreach, such as a "Tree Talk" series, Arbor Day observance, and student service learning projects.

4. TREE CARE POLICIES

ANSI A300 standards provide requirements and recommendations for accepted tree care practices and guidelines for writing work specifications. ANSI A300 standards unify and take authoritative precedence over all previously existing tree care industry standards in USA.

http://www.tcia.org/standards/a300.htm
In 2013 the Davey Resource Group created a "Five-Year Tree Management Solutions for University of Nevada, Reno" (See Appendix 1). This document inventories the more than 3000 trees on campus and lays out a 5-year maintenance plan, which we follow. We use TreeKeeper 7 software to track and schedule maintenance on individual trees. Below is a list of general policies for campus tree care.

**PLANTING**

1:1 No trees will be planted smaller than 1.5” caliper.

1:2 No shrubs will be planted smaller than 5 gallon. 1 gallon can be used after approval from Owner.

1:3 All plant material shall meet the current industrial standards adopted by the American Association of Nurseryman ANSI Z60 Standards and NRS 555.

1:4 All plant material shall be inspected by Owner at the nursery if possible, before delivery to campus and installation.

1:5 Contractor shall Guarantee all plant material for one year after final Inspection.

1:6 Contractor shall maintain all plant material in a healthy condition for 90 days after final inspection.

1:7 Contractor shall be responsible for programming the controller and irrigating all plant material until the end of the 90 day maintenance period including valve maintenance, pipe repair, and head adjustment.

1:8 The owner reserves the right to adjust the plant plan prior to installation.

1:9 Excavate plant holes 3 - 5 times as wide as ball diameter and deep enough to allow placing the root ball in the same relation to finished grade that it has in the container or burlap ball. Hole should be shaped like a bowl, narrow at the base and wide at the top (not shaped like a cylinder). Allow top of root ball and bottom of root flare to extend 2” – 3” above grade in native soil; plant at grade for prepared soil 18” deep. Gradually mound soil up to top of root ball and place earthen ring around edge of root ball. Add mulch 2’ – 3” on ring, but only ½ inch on top of root ball or none at all. Never pile mulch up around trunk of tree. Leave a 10 inch radius from trunk of tree.

1:10 Rock or bark mulch shall be utilized in all non-turf areas. Bark mulch shall be 2” – 3” deep throughout. Mulch should be raked flat and even - no piles or lumps. Rock areas shall include a landscape fabric.

1:11 Cornell Structural Soil Mix shall be utilized under all hard surfaces where trees are to be planted in tree wells surrounded by concrete, pavers, or asphalt. CU Structural Soil Link: [www.hort.cornell.edu/UHI](http://www.hort.cornell.edu/UHI). Then type “Outreach>Structural Soil” in the Search Box at the top.

1:12 Tree ball and burlap root ball diameter shall be 12” for every 1” of trunk diameter.

1:13 Should there be a discrepancy between the American Association of Nurserymen Standards and UNR Standards, UNR standards shall prevail.
1:14 The contractor will notify owners representative to approve plant placement before the planting of all trees, shrubs, & turf.

1:15 Plants with girdling roots will not be accepted and will subject the entire delivery to rejection.

1:16 Trees that have been grown tied directly to stakes will not be accepted.

1:17 Trees and shrubs stored on site shall have their containers or root balls protected from direct sunlight by contractor. For balled and burlap (B & B) trees, heel in and cover with mulch up to top of root ball. Group trees together to prevent wind from blowing them over.

1:18 Trees and shrubs stored on site shall be watered frequently to keep uniform moisture, daily if necessary. Adjust per climatic conditions.

1:19 Do not install plants when the ground is frozen.

1:20 Install plant material plumb and in the center of pit slightly above adjacent grade.

1:21 Do not prune any plant material without authorization from owner’s representative.

1:22 All plant substitutions shall be submitted to owner for approval before award of contract.

1:23 Container plants with densely swirling rigid roots inside the container surface will not be accepted.

1:24 Construction documents shall be on site at all times until final acceptance.

1:25 A competent supervisor shall be on site at all times until completion of landscape installation.

1:26 There shall be a pre-construction meeting with owner’s representative before construction begins.

1:27 All trees planted in areas other than lawn shall be irrigated on a separate zone from shrubs. Exceptions allowed only with approval of owner.

**LANDSCAPING**

- Existing trees shall be preserved where possible. Tree stacking method to be reviewed with Owner.
- Contractor to submit landscape protection and watering plan, and schedule to Owner.
- Landscape design shall minimize water use and maintenance.
- Water conserving native plant materials shall be used to the greatest extent possible.
- Grading, dust control, weed control, curbs, gutters, streets, off-street parking and sidewalks shall conform to local ordinances and local design and site construction standards.
- Site development shall give full consideration to established flood plains, and existing easements and right-of-ways.

**MAINTENANCE AND REMOVAL**
1. Thinning:

The canopy of a tree occasionally becomes so dense that the canopy needs to be thinned. Thinning is the removal of lateral branches at their point of origin or the shortening of a branch or stem by cutting a lateral large enough to assume the terminal role. There are several reasons for thinning a tree. Trees may need to be thinned to minimize storm damage or to allow better air circulation to reduce disease problems. Trees may be thinned as a bird control measure to create a less desirable roosting site. More commonly, trees are usually thinned to allow additional light to reach plants growing beneath the canopy.

2. Raising Limbs:

Raising limbs or crown raising, is the removal of the lower branches of a tree in order to provide clearance. There are several reasons for raising the crown of a tree. Unobstructed visibility is necessary to improve the security and safety of the campus. Along streets and parking lots, it is imperative that the trees have the appropriate clearance of 14 ft. 6in. for vehicular traffic. Pedestrian walkways will not exceed 7 ft. unless special circumstances permit.

3. Deadwooding:

Throughout the lifetime of a tree, it is a normal process for some branches in the canopy to die while new branches are being created. Other branches die due to the affect of disease of other stress factors. In a managed urban forest, trees periodically need to crown cleaning to remove dead, diseased and dying branches. Beside the aesthetic benefits, trees should have deadwood removed to improve the health of the tree and to remove potential hazards for the university community. This is especially important for deadwood larger than four inches, which could cause serious injury to people and property.

4. Removal:

Like all life on earth, trees eventually decline and die. Studies have shown that due to the multiple stresses that exist in the urban environment, trees have a greatly reduced life span. In most cases, these trees cannot be remedied and must be removed. There are two primary reasons for removing a tree: aesthetics and safety. When a tree declines into poor condition, it has exceeded its useful life and should be removed so that it can be replaced with a vigorous healthy tree. In many cases, a tree, regardless of aesthetic appearance, poses a threat to people and property and must be removed.

5. Broken Branches:

Broken branches are a common occurrence caused by the action of wind, machinery, precipitation, or other factor. Many of these branches fail because of poor tree structure of
weak wood. In any case, these branches must be removed because of the liability that they pose to the university community.

6. Training Pruning:

Trees that need training, pruning are smaller trees, and in some cases larger trees, that need to be pruned to direct future growth. These trees have either existing or potential problems with poor branch attachment, interfering or crossing branches, watersprouts, or weak branches. These trees need to be pruned or shaped to direct future growth. The result of this type of pruning is a more beautiful and structurally sound tree and a significant reduction in future maintenance costs.

7. Cabling/Bracing:

Cabling and bracing is the art and science of using cables and/or wood screws (braces) to repair or prolong the usefulness of a tree. Cables are commonly used to help support weak branches, to help straighten trees and to minimize canopy movement to reduce wind damage. Braces are usually used in combination with cables to help stabilize of pull split trunks back together. Cabling and bracing should not be used to correct hazardous tree problems, but they can be useful in prolonging the life of a significant tree.

8. Cavity Filling:

Trees suffer mechanical damage from a number of sources including landscape maintenance equipment, vehicles, the environment and other factors. Many times, trunk wounds are invaded by biological organisms that degrade the woody tissues of the tree resulting in cavities in the trunk. Cavities can be hidden within the trunk, or they can be exposed to the surface leaving a small or large open hole. It becomes difficult or impossible for the tree to grow across the expanse and repair the damage, so it sometimes becomes necessary to fill the cavity so that callus can grow across the hole and close off the cavity to the outside.

9. Stump grinding:

Stumps are the consequence of tree removal. Stumps detract from the aesthetic appearance of the campus and can create safety hazards. Stumps also affect other landscape maintenance activities by creating an obstacle that has to be mowed around. Stumps are removed by using a machine to grind the stumps below the soil surface.

10. Fertilizing:

Continual removal of leaf debris around a tree eventually results in a loss of valuable nutrients that would normally be available to a tree in a natural forest. For this reason, trees in a urban forest need to be supplemented with additional nutrients. This usually involves injecting a soluble, slow-release fertilizer into the soil so that it can be taken up by
the root system. Mulching around the trees is also important for returning nutrients to the soil.

11. Spraying:

Occasionally, trees are attacked by various insects and microorganisms and must be treated to protect them from disease. This usually involves spraying them with a pesticide or in the case of birches the trees are injected with a pesticide.

12. Soil Amending:

Biostimulants and Mycorrhizal fungi are incorporated into the soil profile near the root system of the tree to improve health and vigor.

LIST OF RECOMMENDED SPECIES

- Trees: Red Maple, English Oak, Northern Red Oak, Honey Locust, Atlas Cedar, Spruce, Jeffrey Pine, Crabapple, Sycamore, Tuliptree, Ash, Arbor Vitae, Horse Chestnut, Catalpa, Flowering Dogwood, Black Alder

LIST OF PROHIBITED SPECIES

The following plant materials have been classified as noxious or poisonous and shall not be used on University projects:

- Flower garden plants: Larkspur, Monkshood, Autumn Crocus, Star of Bethlehem, Lily of the Valley, Foxglove, Bleeding Heart (Dutchman’s Breeches).

- Vegetable garden plants: Rhubarb.

- Ornamental plants: Daphne, Wisteria, Golden Chain, Laurels, Jessamine, Lantana Camara, Yew (Red Sage).


- Landscape design shall minimize water use and maintenance.

- Water conserving, native plant materials shall be used to the greatest extent possible.
MANAGING FOR CATASTROPHIC EVENTS

Facilities has a Weather Essential team that assembles in the case of minor damage from high winds, floods, earthquakes, heavy snows, and fires. This team manages the clean-up and removal of any damaged trees and/or debris and also contracts tree removal services.

If the situation in catastrophic an Incident Command Team is assembled and works with local emergency response teams. The university has practice drills to train staff.

5. PROTECTION AND PRESERVATION POLICIES AND PROCEDURES

CONSTRUCTION

1. Construction Damage Causes:
   a. Construction damage around campus trees is an ever increasing problem within UNR’s urban forest. Nearly all campus utilities are located underground. Repairs on utilities require soil excavation, usually around or near trees. As underground utilities age, the frequency of excavation increases due to repairs or replacement. As trees age, their root systems expand placing them at greater risks of damage from construction activities. Severed roots, mechanical damage, and compaction caused by these activities, greatly decreases the life span of the trees.
   b. Proper planning can greatly reduce the damage to existing trees during the construction process. It is important to be informed of construction activities long before they take place. To date however, there has not been a satisfactory avenue to collect this data. If known far enough in advance, several techniques can be used (e.g. growth regulators, moving trees, fertilization, etc) to help the trees survive the construction process. There should be better lines of communication between Grounds Services, project managers, and contractors.

2. Construction Damage Prevention:
   a. Proper prevention begins with managing trees during site planning, site development, and construction phases. We follow the ANSI 300 (Part 5) standards. Requirements include (but not limited to): producing a site survey, a tree resource evaluation, suitability for conservation (Annex A), a tree management report (Annex A), a tree conservation plan, construction recommendation implementation, monitoring of tree health and protection zone barriers, and monitoring Tree Health – initial maintenance.
   b. The key to protecting trees from construction damage is prevention. Trees should not be planted on or near underground utilities. Unfortunately, many existing campus trees are planted in areas where they are vulnerable to construction damage. Once a tree is damaged, saving the tree is a difficult at best.
   c. A certified arborist or other tree specialist from UNR Grounds Services shall be incorporated into all phases of development and construction projects to ensure proper
tree management practices are being utilized. The tree specialist will also “sign-off” with his/her approval on the projects as they relate to tree management.

d. Insert a tree protection clause in General Contractor’s contracts, notifying them of their liability for inappropriate tree damage and associated replacement costs.

3. Tree Preservation

a. Any trees to remain onsite are to be protected by a fence. Any plants onsite need to be watered. If anyone is to enter that fence they are to contact the Grounds director before any excavation in the fenced area is to be undertaken. At no time shall any equipment, gasoline, heavy equipment, or waste be stored in the fenced area.

b. If the tree is to be removed offsite through transplant, fertilization needs to happen 3-6 months prior to its removal (“prepping for surgery”). The proper size of equipment should be used based on the size of the caliper of the tree. Consult with the Grounds Director on relocation areas.

6. TREE DAMAGE ASSESSMENT

Damages to trees on campus are assessed by Grounds Services. The party who damaged the tree is expected to find a suitable replacement, equal to or greater than the value of the original tree. Law enforcement may assist in this process.

7. PROHIBITED PRACTICES

No tree shall be planted or removed without prior authorization from Grounds Services within Facilities Services.

8. DEFINITIONS OF TERMINOLOGY

Canopy/Crown – The live foliage bearing part of the tree

Chlorotic – Yellowing of foliage due to lack of chlorophyll, abiotic conditions, and/or nutrient deficiency

Co-dominant – Tree structure that has two or more main leaders weakly attached at the same point along trunk. Can be a point of failure

Conifer – Cone-bearing, mostly evergreen woody plants. Most conifers have needle or scale-like leaves. Includes pines, firs, spruce and junipers
Deciduous – Broadleaf woody plants that shed their leaves at least one season per year, primarily in the winter. Includes maples, many oaks and elms

Flush cuts – Removal of limbs or branches flush to the parent branch or trunk creating a cut that does not heal over

Foliage – The leaves in the canopy of the tree

Girdling Roots – Roots growing in a circular pattern around base of tree, which can reduce vigor and stability

Included bark – Weak point of attachment where branches have grown together with bark tissue

Inter-nodal – The space between the points (nodes) of attachment of leaves or twigs

Necrotic – Localized death of leaf tissue

Root crown – Flared area at the base of the tree where the roots and stem merge

Scaffold – Large leaders or lateral limbs that support branches and foliage making up the crown of a tree. Usually attached to the main trunk and are critical to tree structure.

DATE CAMPUS TREE PLAN ESTABLISHED

The Campus Tree Care policies have been followed since December 2013 and formalized into a document in December 2014.