

Campus Tree Care Plan

Tree Planting and Maintenance Best Practices

Colorado State University Facilities Management employees and tree care companies contracted to do work on CSU campuses shall be supervised in their work efforts by an International Society of Arboriculture (ISA) Certified Arborist, or by an individual holding a current arborist license issued by the City of Fort Collins Forestry Division. The work shall be performed in accordance with American National Standards Institute (ANSI) A300 Standards for Tree Care Operations. Best Management Practices for Tree Care Operations on the CSU campuses are defined in the following publications, available from the International Society of Arboriculture. These publications can be accessed online at <http://isa-arbor.com/home.aspx>

- ANSI A300 Best Management Practices – Tree Pruning
- ANSI A300 Best Management Practices – Utility Pruning of Trees
- ANSI A300 Best Management Practices – Tree Support Systems
- ANSI A300 Best Management Practices – Tree Lightning Protection Systems
- ANSI A300 Best Management Practices – Tree Planting
- ANSI A300 Best Management Practices – Integrated Pest Management
- ANSI A300 Best Management Practices – Managing Trees during Construction
- ANSI A300 Best Management Practices – Tree and Shrub Fertilization

Landscaping Standards

Standards for tree planting and protection are contained within the Colorado State University Facilities Planning, Design and Construction Technical Standards, Division 32 – Exterior Improvements - https://www.fm.colostate.edu/constr_standards/

Drawings detailing the standards for tree planting and protection are contained within the Colorado State University Facilities Planning, Design and Construction Standards - Additional Documents - https://www.fm.colostate.edu/constr_standards/

Tree Removal Policy

Trees with a potential of being removed as part of construction or utility projects are evaluated on a tree-by-tree basis. The process for removal, transplanting or protection is detailed in the Protection and Preservation section of this document.

Trees potentially requiring removal because of disease or safety risks posed to the campus community undergo a risk assessment by the Campus Arborist, City Arborist, and Campus Landscape Architect. Based on this assessment, a recommendation is made to the Associate Vice President for Facilities Management and the Vice President for University Operations. If the determination is made that a tree requires removal, the removal is communicated to the campus community through the building proctors.

Trees that require removal as part of major campus development projects must be approved for

removal as part of the development review process. The University Landscape Architect reviews all tree removal proposals and recommends further action as necessary. Diversity of tree species is encouraged with all tree replacement, in accordance with the university's designation as an ArbNet arboretum.

Wood Utilization Policy

Facilities Management at CSU is dedicated to the responsible management of all wood waste associated with tree care operations, including dead, broken, or low-value wood as caused by heavy snowfall or strong winds. All wood waste from tree care operations is chipped on campus. The chipped wood is then used as high-quality mulch on landscaping projects across campus. Removed wood material is also milled with the intention for use within the interior millwork of on-campus construction and remodel projects. No wood or material is sent to the landfill, except that which is suspected as being infected by disease.

Recommended Species

Trees recommended for planting on the CSU campuses are listed in the Front Range Tree Recommendation List - <https://extension.colostate.edu/docs/pubs/garden/treereclist.pdf>. The Larimer County CSU campuses vary in soil characteristics, exposure, and temperature extremes. The recommended list is intended as a reference for design consultants doing work on the CSU campuses; however, all tree plantings require the approval of the Campus Landscape Architect. Building projects require planting plans, which specify both species and size of proposed trees, and these plans also require the approval of the Campus Landscape Architect.

Prohibited Species

Trees listed in the National Resources Conservation Service State of Colorado Invasive weed list (<https://plants.usda.gov/home/noxiousInvasiveSearch>) are prohibited from plantings on campus. As of 2007 there has been a moratorium on any new plantings of green or American ash because of a concern about emerald ash borer, and due to an overrepresentation (on a percentage basis) of green ash on the CSU campuses.

Managing for Catastrophic Events

Catastrophic events are managed by the CSU Emergency Management Team. This team includes members from Facilities Management, the CSU Police Department and Environmental Health. The CSU campuses frequently experience early and late season snowstorms (three major events in the last 10 years). Each of these events caused significant damage to trees on the campuses, especially in the historic Oval area. The first priority of the Emergency Management Team is the safety of the campus community.

Areas of campus which are assessed at high risk for either branch or total tree failure by the Outdoor Service Group are closed to vehicle and pedestrian traffic during major events, and individual trees that are assessed as high risk are cordoned off. Arborists from the Outdoor Services Group and external tree care companies are called in immediately to remove limbs and trees that pose the highest risk.

Work continues by both the internal and external work forces until risks are removed and trees damaged in the event have been pruned for safety and long-term structural health. Trees destroyed in catastrophic events are replaced on a tree-for-tree basis.

Protection and Preservation Policies

Colorado State University recognizes the environmental, economic, and aesthetic value of the campus urban forest and focuses efforts to be good stewards of trees on campus with specific concerns for both significant individual trees and significant collections.

Trees that have potential for damage from development activities on campus are subject to the following process:

1. The contractor or design-build team shall provide a tree inventory of all the trees on site and develop a tree mitigation plan as part of the work.
2. The Campus Landscape Architect works with a design team starting in the conceptual design phase to determine if there are alternatives to building, utility and pavement layouts which will allow for existing trees to remain in the project.
3. An existing conditions drawing, based on a topographic survey and detailing the location and size of each existing tree, is submitted as part of schematic design submittal. Based on this submittal, the design consultant, working with the Campus Landscape Architect and Campus Arborist, makes a determination as to which trees are to be removed, transplanted or protected. Trees up to 10" DBH are considered of transplantable size, and are moved per the following criteria. *(Source: University of Minnesota Extension)*

Tree spade sizes for deciduous and evergreen trees

Tree spade size	Deciduous tree - trunk diameter	Evergreen tree - height
44 inches	2 to 3 inches	5 to 7 feet
66 inches	3 to 5 inches	7 to 10 feet
92 inches	6 to 8 inches	12 to 15 feet

4. Trees to be removed are replaced based on the standards described as follows (these standards mirror the replacement process required of development projects in the City of Fort Collins). A tree that is removed shall be replaced on the CSU campus from which it was removed with not less than one (1) or more than two (2) replacement trees sufficient to mitigate the loss of value of the removed tree. The applicant shall select either the Campus Landscape Architect or a qualified landscape appraiser to determine such loss based upon an appraisal of the tree to be removed by using the most recent published methods established by the Council of Tree and Landscape Appraisers (<https://www.isa-arbor.com/store/product/4390>). Replacement trees shall meet the following minimum size

requirements: (a) Canopy Shade Trees - 3.0" caliper balled and burlap or equivalent, (b) Ornamental Trees - 2.5" caliper balled and burlap or equivalent, (c) Evergreen Trees – 8' height balled and burlap or equivalent

5. All development projects require a Tree Protection Plan as part of Contract Documents. The Tree Protection Plan is enforced through the life of the project by the CSU Project Manager assigned to the project and the Campus Landscape Architect. The contractor is required to follow ANSI A300 Best Management Practices – Managing Trees during construction. This requirement is reinforced with the contractor throughout the project, starting with the CSU-mandated pre-construction meeting, in which specific tree protection for the project is discussed on a tree-by-tree basis with the site superintendent.

Goals and Targets

Inventory: A comprehensive GIS inventory of all campus trees has been developed within Facilities Management. Using this inventory, goals are to complete a campus-wide tree canopy analysis and set a canopy percentage goal to be achieved through strategic tree planting. The use of available software such as i-Tree to complete an environmental services statistical sampling inventory will help meet goals of the campus-wide Sustainability Tracking Assessment and Rating System (STARS) program. In 2013, students in the HORT 466, Urban and Community Forestry Class, began this i-Tree analysis and it continues to be a component of the class.

Tree replacement: Implement tree replacement and damage assessment policies as outlined in the Campus Tree Care Plan. Since 2012, CSU has implemented Arbor Day observance planting projects on campus each year with students, employees, and community.

Increase species representation: Using the GIS tree inventory as a benchmark, increase the percentage of underrepresented species, especially in the historic areas of campus. Recent planting projects include considerations toward increased species diversity.

Shorten pruning cycle in overly mature trees: Obtain resources to increase the frequency of pruning in the historic pre-1922 American elm Oval area. See “Oval Preservation” below for more details.

Experiential Learning and Outreach: The University will focus on providing 1-2 experiential learning opportunities per semester in urban and community forestry to CSU students and the surrounding community. Students and volunteers will assist with efforts in inventory and tree care. An Urban and Community Forestry Course (HORT 466) is offered in fall (odd years): 2013; 2015; 2017; 2019; 2021. Additionally CSU Extension consistently offers all learners the opportunity to gain skills in tree planting and care, and other tree topics. CSU Extension posts publications with tips (<https://cmg.extension.colostate.edu/gardening-resources/online-garden-publications/trees-and-shrubs/>) and offer free online classes to the public at <http://csuhort.blogspot.com/p/csu-extension-spring-gardening-webinars.html>.

Emerald Ash Borer (EAB): EAB was confirmed in Fort Collins in 2020, but has not yet been identified at CSU. The University anticipates that up to three quarters of the ash on campus justify treatments based

on their condition and contribution to the campus environment. Funding is in place to remove and replace the remaining untreated ash trees. Base funding will be allocated through 2025, which we will use for treating trees, as well as to address the ongoing cost of removal and replacement dollars. In 2022: Total Ash trees = 894; Ash trees to be treated = 590; Ash trees remaining to be removed = 304. To date over 250 Ash trees were removed. Treatment is on a 3-year cycle and began in Spring 2021. (See tree care plan below for treatment of trees.) In 2022, we treated approximately 95 ash trees.

Oval Preservation: Facilities Management maintains routine pruning of the historic trees on the Oval to help prevent damage and keep the trees healthy, an investment of \$125,000 or more each time the trees are pruned. Costs are supported through university funds. The Oval Tree Preservation Endowment was created in 2011 to devote resources specifically to preserving the elms, and contributes a fraction of the costs until it reaches a sustainable level. In 2022 we spent \$17,230 treating Oval elms for elm scale.

Tree Stocking: The campus goal is to establish and maintain optimal tree stocking, and optimal age and species diversity of the campus urban forest. We are moving towards these goals through the current construction projects. A minimum of two trees are being replaced for every one tree removed as a result of the current era of construction - an era of construction which is unprecedented since the 1960s. Our tree planting efforts are resulting in a 5% increase in the total number of trees in our main campus urban forest. At the same time as we are increasing the urban forest in absolute numbers, we are also increasing species diversity.

[Emerald Ash Borer - Plan for Treatment of Trees](#)

CSU has developed treatment recommendations appropriate for the Front Range and Colorado.

Trees are treated per the following criteria:

1. Size of tree
 - Trees of a significant size (over 15" DBH) will be evaluated for treatment
2. Tree benefit to the public and CSU
 - Trees that provide significant environmental, social, or economic value are candidates for treatment.
3. Health of tree
 - Very mature and declining trees are not the best candidates for treatment.
 - If there is less than 40% canopy dieback, treatment may be effective.

Treatment protocol:

- CSU will treat trees evaluated to remain on campus over a 3-year cycle through trunk injection of Emamectin Benzoate.

Tree Replacement for EAB:

- Diversity of tree species is encouraged with all tree replacement, in accordance with the university's designation as an ArbNet arboretum.
- The Front Range Tree Recommendation List is an excellent resource for recommended tree species; developed by CSU Extension, CTC, CNGA and ASLA. A copy of this list is available on the CNGA website – <https://extension.colostate.edu/docs/pubs/garden/treereclist.pdf>

If EAB is suspected on campus, contact:

Colorado State University Facilities Management Dispatch (970) 491-0077 and ask to speak to the Campus Arborist in our Outdoor Services team.

Tree Damage Assessment

Trees damaged during construction, which are either noted for protection or preservation in the project Contract Documents, or are outside the development limits of work, shall require monetary compensation from responsible parties.

The damage will be assessed by the Campus Landscape Architect or a qualified landscape appraiser based upon an appraisal of the damaged tree using the most recent published methods established by the Council of Tree and Landscape Appraisers. The amount of monetary compensation shall be the full value of the tree.

Prohibited Practices

Practices not consistent with the Best Management Practices referenced in this Tree Care Plan are prohibited. In addition, the following practices are regulated by CSU Facilities Management and CSU Police Department, and prohibited on the CSU campuses:

- Locking of bikes to campus trees
- Attachment of slack lines and hammocks to campus trees, except for designated areas
- Attachment of swings and ropes to campus trees

Definitions of Terminology

Unless defined below, definitions of terminology are to be those defined in the International Society of Arboriculture online dictionary at www.isa-arbor.com/Dictionary/

American National Standards Institute A300 standards (commonly referred to as the ANSI A300) - Industry developed, national consensus safety standards of practice for tree care in the U.S.

National Standards Institute Z133.1 standards (commonly referred to as the ANSI Z133.1) - Industry-developed, national consensus safety standards of practice for tree care in the U.S.

Best management practice - Best available, industry-recognized course of action, in consideration of the benefits and limitations, based on scientific research and current knowledge.

Campus Arborist - The Colorado State University Facilities Management Arborist or duly designated representative.

Campus Landscape Architect - The Colorado State University Facilities Management Landscape Architect or duly designated representative.

Canopy tree - A tree that will grow to a mature height of at least 35 feet with a spread of at least 25 feet.

City Forester - The City Forester of Fort Collins or a duly designated representative.

Development - The act, process or state of erecting buildings or structures, or making improvements to a parcel or tract of land.

Green Space - Any area retained as permeable unpaved ground and dedicated on the site plan to supporting vegetation.

Irrigation Plan - A construction drawing, approved by the Campus Landscape Architect, detailing the layout of mainline and lateral irrigation, valves, sprinkler heads and control wiring.

Job briefing -The communication of at least the following subjects for arboricultural operations: work specifications, hazards associated with the job, work procedures involved, special precautions, electrical hazards, job assignments, and personal protective equipment.

Landscape Plan - A construction drawing, approved by the Campus Landscape Architect, detailing the layout of plant material, as well as the species, sizes of the plant materials and the method of installation.

Replacement tree – A tree indicated on the Landscape Plan which replaces a tree removed as part of campus development.

Tree Protection Plan – A drawing included in the Contract Documents showing the location and means and methods of protection of each tree to be preserved on development sites.

Communication Strategy

The Campus Tree Care Plan and Policies are approved by the Campus Tree Advisory Committee, as well as from Colorado State University Administration. The university takes several steps to garner attention for the Tree Campus Higher Education program and CSU's ArbNet arboretum status.

To increase awareness among the university's internal audience (students and employees), MarComm publishes articles about the value of trees, tree plantings on campus, and CSU's participation in the Tree Campus Higher Education program, as well as CSU's ArbNet arboretum status. Stories are published in various locations such as: *SOURCE*, a news email sent thrice weekly to students and employees; *CSU Life*, a monthly publication designed specifically for faculty and staff; and in the CSU Facilities Management Department newsletters, *FM News* and *Facilities Focus*. CSU's ArbNet arboretum status and Tree Campus Higher Education certification is additionally featured on university websites, including the CSU Facilities Management site (<https://www.fm.colostate.edu/arboretum>). MarComm and the Colorado State Forest Service help to communicate about and promote our spring Arbor Day event by sending a news release about the Campus Arboretum and Tree Campus Higher Education program to local media outlets such as the Rocky Mountain Collegian, the daily student newspaper; KCSU, the student radio station; and CTV, the student television news station. The news is also shared through CSU's main and CSU Extension's social media accounts.

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Ongoing service-learning opportunities provide further opportunities to communicate information about the importance of protecting and maintaining trees on campus and in the surrounding Fort Collins community.