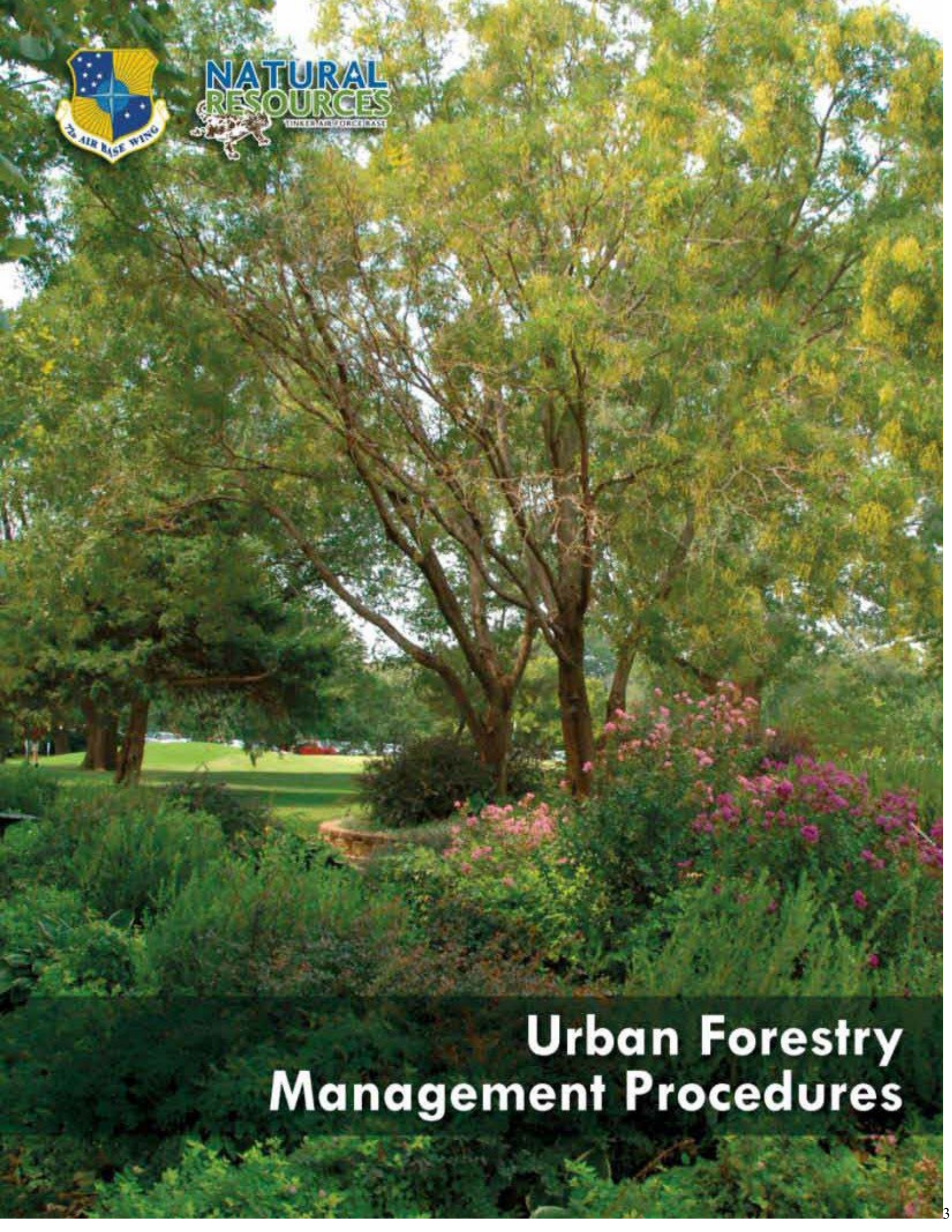

Urban Forestry Management Procedures

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Civil Engineering Directorate, 72 ABW/CEIEC, Tinker Air Force Base, Oklahoma.

Contents

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Chapter 1 INTRODUCTION

Purpose for Plan

The purpose of these procedures is to establish policy to more effectively and efficiently manage Tinker's urban forest consistent with the local ecoregion, encourage more community ownership/involvement, and improve forest health thereby optimizing the benefits provided by trees. Primary benefits include:

- Enhanced installation appearance,
- Temperature reduction and energy savings by shading,
- Reduction in air pollutants,
- Soil stabilization,
- Improved warfighter and surrounding community quality of life,
- Enhanced fish and wildlife habitat,
- Noise attenuation, and
- Reduced wind velocities in pedestrian areas by creation of wind breaks.

Secondarily, these procedures are intended to fulfill the "Tree Ordinance" requirements of the National Arbor Day Foundation's Tree City USA program.

Definitions

Urban forest is defined as primarily street and park trees that are located on base (including privatized military family housing as trees are considered real property--DODI 4715.03, para. 7.b., p.12) improved and semi-improved grounds (i.e., basically grounds that are mowed). Trees located in unimproved grounds (e.g., Urban Greenway, Glenwood area, riparian areas) or that occur as groupings with dense understory vegetation are a part of the urban forest but shall be considered and managed as "tree stands," not as individual trees.

Chapter 2 URBAN FORESTRY WORKING GROUP

a. The purpose and intent of the Urban Forestry Working Group (UFWG) is to:
   1) Provide community input to strengthen urban forestry policy,
   2) Facilitate inter-organizational communication regarding tree care issues,
   3) Establish a common base-wide urban forestry vision,
   4) Establish base-wide standardization of tree care practices,
   5) Foster continuity during personnel transitions,
   6) Provide a venue for urban forestry education and awareness, and
   7) Facilitate development of a community-based urban forestry program.

b. To aid in achieving this, the base has been divided into urban forestry management units (Attachment 1). The UFWG will be comprised of representatives from each urban forestry management unit. Each organization will provide a primary and alternate representative. Urban forestry management units and their representatives are as follows:

   Industrial North – 72 ABW/CEY and local facility representatives

Industrial East – 72 ABW/CEY and local facility representatives
Industrial South 1 through 7 – 72 ABW/CEY and local facility representatives
Community (Commercial) 1– 72 ABW/CEY and local facility representatives
Community (Commercial) 2 – 72 ABW/CEY and local facility representatives
Community (Residential) – 72 ABW/CEIH; Privatization Contractor
Glenwood – 72 ABW/CEIEC and 72 ABW/CEY
Munitions –72 ABW/CEIEC and 72 ABW/CEY
Golf Course – 72 FSS/FSCG
AWACS – 552 ACW/CEE
AWACS Alert – 552 ACW/CEE
507th/513th – 507 LRS/LGRS
Navy – SCW-1/N46
CEIG – 38 CEIG/OSR
Gator – 72 ABW/CEY
Open Space 1 through 5 – 72 ABW/CEIEC and 72 ABW/CEY
General:
Architectural Compatibility Board – 72 ABW/CENMP
Pest Management Shop – 72 ABW/CECOUC
Services – 72 FSS/FSFY
Corp of Engineers – CESWT-EC-FC
Civil Engineering Construction Management – 72 ABW/CENM
Civil Engineering Electric Shop – 72 ABW/CECOIE

c. The UFWG will be chaired by the base natural resources manager, who serves as the base urban forester.

d. The UFWG will meet a minimum of once a year, usually in early December.

e. The UFWG will be responsible for working toward equitable contributions from their units to ensure the base annually meets the National Arbor Foundation's Tree City USA requirements.

Chapter 3 URBAN FOREST INVENTORY

The foundational tool being used to manage Tinker's urban forest is the urban forest inventory. This Geographic Information System-based (GIS) inventory includes the following attributes to more effectively and efficiently manage the Tinker's urban forest resources.

a. Species composition, age, and percent cover
   1) Each tree is identified to species (cultivar if applicable) and catalogued by scientific and common names.
   2) GIS data layer (i.e., point layer) of native and non-native tree species. Each tree and certain tree groupings or stands are numerically identified.
   3) GIS data layer of invasive tree species.

4) GIS data layer showing % canopy cover.
5) GIS data layer showing estimated age.
6) Each tree is marked with a numbered aluminum tag nailed to the tree at approximately 6 feet above ground level.

b. Tree health
1) GIS data layer showing tree health (poor, fair, good) to include reasons why trees are in poor/fair health (e.g., disease, insect damage, lightning damage, wrong species/wrong place, general decline due to age).

c. Tree management
1) GIS data layer identifying hazard trees. Each tree is designated with a hazard potential class of high, moderate, or low and the reasons for the designation.
2) GIS data layer showing trees that need pruning or that are recommended for removal. Each tree needing pruning is designated with a pruning class of major, moderate, minor. The data layer shows trees needing removal because of such things as high long-term maintenance (e.g., trees too close to power lines); potential facility damage (e.g., trees growing close to foundations); or that pose security issues (e.g., trees overhanging security fences).
3) GIS data layer of removed and newly planted trees.
4) GIS data layer showing urban forest management units.
5) GIS data layer showing areas where trees could be planted (e.g., open areas, playgrounds, west sides of homes/buildings for energy conservation) and where they cannot be planted (e.g., clear zones). Also, this layer includes “evaluation zones” which are areas with possible conflicts (e.g., large utility corridors, power line corridors, perimeter fence line, interior security fence lines, street light locations).
6) GIS data layer showing trees which are considered flight or glide slope instrumentation obstacles which could compromise aircraft and aircrew safety.

Chapter 4 TREE PLANTING/REMOVAL PERMIT SYSTEM

In Oct 2009, a tree planting and removal permit system was implemented to facilitate effective and efficient management of Tinker's urban forest (see implementation letter and permit at Attachment 2). Prior to removing or planting any tree on Tinker AFB property, a tree removal/planting permit will be required. Personnel requesting a permit should contact the natural resources function who is the permit issuing authority. The permit system is designed to accomplish the following:

a. Ensure proper types of trees are planted in compliance with *Presidential Memorandum, Environmentally and Economically Beneficial Practices on Federal Landscaped Grounds*, April 26, 1994.
b. Ensure trees are planted in proper locations that will not create conflicts now or in the future (e.g., interference with powerlines, cracking/heaving of sidewalks, attracting pest birds).
c. Ensure appropriate action is taken for proposed tree removals and to document and track reasons for tree die-off (e.g., Does the tree actually need to be removed? Can the tree be transplanted? Is the tree diseased, and could it potentially spread to surrounding trees?).
d. Ensure salvageable trees (i.e., lumber, firewood, installed in ponds for fish and wildlife habitat) are properly used/disposed of according to Air Force and DOD instructions.
e. Track post-planting tree maintenance needs (e.g., irrigation, tree staking, and guying).
f. Facilitate upkeep of the urban forest inventory GIS.
g. Ensure compliance with the Urban Forestry Management Procedures.

Chapter 5 TREE CARE TRAINING PROGRAM

The tree care training program is held as needed to encourage consistent quality tree care services (e.g., planting, irrigating, and pruning) basewide. The program ensures all personnel performing maintenance work on trees on Tinker AFB are properly qualified. Training will consist of the following:

a. Mandatory attendance and participation in a one-day tree care workshop hosted by Tinker AFB natural resources staff, Oklahoma Department of Agriculture Food and Forestry Division urban foresters, and other tree care professionals. This event is conducted on Tinker AFB and at no cost to the participants. Workshops may be a combination of classroom instruction and hands-on field exercises.

b. As a minimum, supervisors/leads of all government and contracted grounds maintenance/golf course personnel, exterior electric shop personnel, military family housing tree service providers, and others who will perform tree maintenance on Tinker AFB are required to complete this training prior to initiating tree care activities. Proof of current arborist certification (i.e., Certified Arborist) may be considered in lieu of workshop attendance.

Chapter 6 STANDARDS AND SPECIFICATIONS

The purpose of this section is to outline basic Tinker AFB-specific tree care standards and specifications to improve tree health and survivability and to prevent potential structural damage caused by trees. It is intended to address tree care issues that have been especially problematic at Tinker AFB and is not intended to be an exhaustive specification on tree care. Refer to *Tree Care Policy Guide* (Attachment 3) for additional information. This applies to all entities involved in tree-related work on Tinker AFB.

Selection

In accordance with *Presidential Memorandum, Environmentally and Economically Beneficial Practices on Federal Landscaped Grounds,* April 26, 1994, and where cost effective and to the maximum extent practicable, all trees used for landscaping on Tinker AFB shall be native (varieties/subspecies and cultivars of native species are acceptable) to the local region. Local region is defined as:

a. Central Oklahoma/Texas Plains and Central Great Plains ecoregions [*Oklahoma's Biodiversity Plan: A Shared Vision for Conserving Our Natural Heritage, 1996*], and
b. Prairie and Great Plains Region [*An Annotated List of the Ferns, Fern Allies, Gymnosperms and Flowering Plants of Oklahoma, 1994*].

Refer to *Tree Care Policy Guide* (Attachment 3) for trees approved for planting on Tinker AFB.

Planting/Transplanting/Removal

Tinker AFB shall utilize the specification guidelines outlined in the *US Air Force Landscape Design Guide* as a starting point for developing tree planting and maintenance specifications for base projects. As appropriate, all applicable tree care policies in the *Tree Care Policy Guide* (Attachment 3) shall be incorporated into specifications for all base projects to ensure Tinker AFB-specific tree care issues are adequately addressed. Also, the following guidelines shall be followed:

a. All trees shall be installed as shown in the planting detail (Attachment 4) unless specific changes are necessitated by such things as poor drainage.

b. Trees to be planted on Tinker AFB shall not exceed 1.5 inches in trunk diameter (measured at 6 inches above the top of the root ball or soil in a containerized plant) at the time of planting unless on an automatic irrigation system. Variances may be granted by the natural resources office under certain circumstances.

c. Trees which produce messy fruit (e.g., plum, mulberry) shall not be planted over sidewalks, driveways, trails, or other areas where conflicts could arise. Trees which are known to emit sap (e.g., sycamores, cottonwoods) shall not be planted over driveways or other areas where vehicles will be parked.

d. Only certain small-maturing trees approved by the natural resources office will be permitted to be planted under power lines.

e. Trees shall not be planted on Tinker AFB in such a way as to be an attractant to flocking birds near the airfield or in areas frequented by pedestrians.

f. Although trees may be planted year round, when possible, they should be planted during the fall (September – November) which is the optimum time to plant in Oklahoma.

g. Where groupings of trees are to be planted or in parking lot situations where harsh soil conditions (e.g., poor fertility, compacted) exist, and as appropriate for the site, topsoil berms (~12 to 18 inches) shall be constructed and turfed and then the trees planted in the bermed area. This will promote a better growing environment for the trees.

h. If select trees cannot be retained on a particular site, they shall be transplanted when practicable. For purposes on Tinker AFB, transplantable trees are typically defined as healthy, native, well-formed trees with trunk diameters between 1 and 6 inches (measured at 6 inches above the ground).

i. All contract-provided trees shall comply with ANSI Z60.1 – 2014 American Standard for Nursery Stock.

j. Trees shall not be planted in clear zones or such that they, when mature, breach Transitional and /or Approach-Departure Surfaces. Waivers may be authorized by Civil Engineering under special circumstances.

k. If trees are removed or planted on base, a permit must be obtained prior to commencement of work. Contact Civil Engineering Natural Resources for permitting information.

l. Trees that are to be planted next to sidewalks, driveways, or similar structures shall be planted a minimum of 6 feet away from such structures. Variances may be granted by the base urban forester under certain circumstances.

m. Trees brought to the base from off-base locations must be certified to be free of invasive insect species such as imported red fire ants. For fire ants specifically, it shall be verified that the trees are coming from non-quarantine areas (as designated by the Oklahoma Department of Agriculture). Or, if trees are coming from quarantined areas, verification of a Federal Compliance Agreement or state phyto-sanitary certificate must be provided by the nursery.

Maintenance

All base tree care activities such as pruning (including utility line clearance), fertilizing, guying, etc. shall be accomplished in accordance with the following American National Standards Institute (ANSI) standards (most current edition):

- ANSI A300 (Part 1) – 2001 Pruning
- ANSI A300 (Part 2) – 1998 Fertilization
- ANSI A300 (Part 3) – 2000 Support Systems: Cabling, Bracing, and Guying

- ANSI A300 (Part 4) – 2002 Lightning Protection Systems
- ANSI Z133.1 – 2000 Pruning, Repairing, Maintaining, and Removing Trees, and Cutting Brush – Safety Requirements.

In addition, the following maintenance guidelines shall be employed:

a. All newly planted trees on Tinker AFB shall be watered at least once a week during the growing season (April – September) and once a month during the dormant season (October – March) for a minimum of 2 years. Watering may be skipped if a rain event of at least 1 inch has occurred since the last watering. Slow, drip-type irrigation, such as Gator drip irrigation bags, or equivalent, are recommended if an irrigation system is not available.

b. Every 2 years, grounds maintenance personnel shall remove deciduous saplings under the canopy of cedars and around all buildings on improved grounds on Tinker AFB.

e. As a general practice, cedars shall not have limbs pruned up their trunks, but should be left in their natural pyramidal form.

Tree Protection

Root Zone Protection

Root zones shall be protected from erosion, soil compaction, unearthing, severing, and other activities that could be harmful to the health of trees. Trees that are to be retained in place during construction shall be fenced off using steel T-posts and high visibility barrier fencing prior to bringing construction equipment on site. Fencing shall be installed 10 feet beyond the drip line of each tree or cluster of trees (see Attachment 4 for details). Where this is not practicable, trees shall be fenced at the drip line, as a minimum. No vehicles, equipment, or supplies shall be staged within the barricaded area. Tree care procedures shall be accomplished for the duration of construction.

In some locations where barrier fencing is not appropriate, such as in areas where construction vehicles must travel over root zones, impacts must be minimized by such practices as temporary placement of heavy woodchip mulch (10” deep minimum) on the area to be traversed prior to commencement of work.

Trenching across root zones shall be avoided. Alternatives such as reconfiguring trench routes or horizontal boring shall be explored. If trenching across a root zone is the only viable option, the trench zone shall be air-spaded, and then the roots shall be severed cleanly with specialized equipment prior to trenching.

Trunk Protection

All newly planted trees shall be protected with tree guards (Arbor Guard or equivalent) until such a time as the tree’s bark is mature enough to withstand repeated string trimmer contact. Guard placement shall be such that the base of the guard is in firm contact with the soil at the base of the tree. It shall be securely tacked (1/2- to 3/4-inch tack) to the tree to prevent the guard from sliding up or coming off the trunk. The tack shall be opposite the open end of the tree guard such that the

guard can freely expand as the tree grows.

Concrete tree rings, raised flower bed planters, and other similar structures shall not be installed around the bases of trees.

Grounds maintenance personnel shall not allow mower decks to come in contact with trees during mowing activities.

Tree Protection Plan
Prior to construction activities around trees, a tree protection plan shall be submitted to the natural resources office for coordination/approval. This is not intended to be an extensive, costly plan but rather a simple outline detailing what will be done to protect the trees during construction. The plan shall include:

a. Plan view sketch or drawing of site showing tree locations and proposed protection measures.
b. A brief narrative of what materials will be used and when they will be installed and removed.
c. If trenching is required across a root zone, techniques used to minimize root damage shall be described (see Root Zone Protection above).

Urban Forestry Monitoring
To ensure base compliance with the aforementioned standards and specifications, routine monitoring will be accomplished by natural resources staff. Monitoring will be based on the Urban Forestry Checklist (Attachment 5).

Tree Salvage

As determined by the Government (i.e., Civil Engineering natural resources staff), all marketable or otherwise recyclable/salvageable trees removed from construction sites shall be salvaged and hauled to Government-designated on-base sites. The Government will determine which tree products will be salvaged and may include, but are not limited to:

Logs
Large millable trees shall be cut down by the contractor in dimensions specified by the Government. The contractor shall load, haul, and off-load the logs intact and undamaged.

Firewood
Some unmillable trees, or limbs removed from millable trees, shall be cut into clean (i.e., no small branches, stubs, leaves, etc.) 16-inch firewood lengths and hauled to the on-base forest products staging area. The Contractor shall off-load and stack the firewood at the staging area as directed by the Government. This shall be done for all branches and trunks over 2-inches in diameter. All limbs smaller than 2-inches in diameter and all other tree debris shall be properly disposed of off-base by the Contractor.

Fish & Wildlife Structure
Some trees shall be hauled essentially intact and placed in base ponds or other areas for fish and wildlife habitat improvements or other conservation program needs. Rootballs from felled trees shall be removed intact and placed in ponds or other on-base locations. The Government will designate the locations.

Chapter 7 TREE CITY USA

In 1991, the "America the Beautiful" Program was initiated to provide an environmental legacy for future generations, enhance existing resources, and address mounting public concerns about the buildup of atmospheric carbon dioxide. The national program called for a public and private sector cooperative approach with a goal of planting, improving, and maintaining nearly one billion trees per year nationwide. Then Chief of Staff, General Merrill McPeak, endorsed the program and set a goal for all Air Force bases to achieve the National Arbor Day Foundation's "Tree City USA" designation by 1994. Also, AFI 32-7064, *Integrated Natural Resources Management,* requires that Air Force installations in the United States become designated as Tree City USA's through the National Arbor Day Foundation.

Tinker AFB first became a Tree City USA in 1993 and has been recertified annually since that date. To maintain certification, four standards must be met for each calendar year:

1) *Standard 1:* A tree board or department. Establishment of Tinker's Urban Forestry Working Group (Chapter 2 of these procedures) meets this requirement.

2) *Standard 2:* A community tree ordinance. These Urban Forestry Management Procedures meets this requirement.

3) *Standard 3:* A community forestry program with an annual budget of at least $2 per capita. See "Tree Expenditures by Year" for a breakdown of expenses for urban forestry projects and activities on Tinker AFB since 1993.

4) *Standard 4:* An Arbor Day observance and proclamation. Standard 4 is typically met during Arbor Week (last full week of March each year) activities. Examples of activities include volunteer tree seedling planting events at tree farm; tree care workshops; and ceremonial tree plantings.

Tree Expenditures by Year			
Year	**Total Expenditures**	**Population**	**Expense (Per Capita)**
1993	$ 384,428	3,161	121.62
1994	$ 114,398	3,161	36.19
1995	$ 138,514	3,161	43.82
1996	$ 190,632	3,161	60.31
1997	$ 83,450	3,161	26.40
1998	$ 348,176	3,161	110.15
1999	$ 131,537	3,161	41.61
2000	$ 161,000	3,292	48.91
2001	$ 86,448	3,465	24.95
2002	$ 218,291	3,468	62.94
2003	$ 235,237	3,598	65.38
2004	$ 132,775	3,598	36.90
2005	$ 120,624	3,598	33.53
2006	$ 170,715	3,598	47.45
2007	$ 77,430	3,367	23.00
2008	$1,258,440*	2,997	419.90
2009	$ 216,389	2,986	72.47
2010	$ 149,507	2,876	51.98
2011	$ 199,833	2,673	74.76
2012	$ 70,321	3,155	22.29
2013	$ 104,390	2,908	35.90
2014	$ 93,287	2,864	32.57
2015	$ 128,069	2,812	45.54
2016	$ 159,303	2,848	55.94
2017	$ 244,084	2,871	85.02
2018	$ 372,320	2,838	131.19
2019	$ 245,288	2,360	103.94
2020	$ 61,045	2,277	26.81
2021	$ 238,088	2,505	95.05
2022	$ 126,038	2,852	44.19
2023	$ 109,829	2,616	41.98

* Spike in 2008 expenditures was a consequence of the Dec 2007 ice storm tree cleanup.

The following synopsizes Tinker AFB Arbor Day activities since 2007:

2007: The base planted a Centennial Grove [one-hundred eastern redbuds (*Cercis canadensis*) from base tree farm] around the 9th green in celebration of Oklahoma's 100th birthday. This Arbor Day event was recognized as an official Centennial project by the Oklahoma Capitol Complex and Centennial Commemoration Commission.

2008: Four trees (winged elms) were planted at the base youth center by children and staff from the center.

2009: Tinker Federal Civic Leaders (a college student scholarship group) from Rose State College and Tinker AFB natural resources staff planted eighteen trees around the base Tinker Federal Credit Union. The students also planted eighteen Tinker AFB-grown trees on grounds at Rose State College and the Midwest City Chamber of Commerce under a memorandum of understanding.

2010: Tinker Federal Civic Leaders from Rose State College and Tinker AFB natural resources staff planted forty trees at the base Child Development Center (east) and ten trees at Rose State College.

2011: Tinker Federal Civic Leaders from Rose State College, Tinker AFB natural resources and golf course staff, and other volunteers planted 319 Tinker AFB-grown trees around FAM Camp; rifle range; B-5910; 3rd Combat Communications Group; in the Urban Greenway; and along Arnold and "F" Avenues.

2012: Tinker Federal Civic Leaders from Rose State College and Tinker AFB natural resources staff planted 35 trees at FAM Camp.

2013: Tinker Federal Civic Leaders from Rose State College and Tinker AFB natural resources staff planted 15 trees at FAM Camp.

2014: Tinker Federal Civic Leaders from Rose State College and Tinker AFB natural resources staff planted 50 trees in Reserve 3 of the Urban Greenway south and west of B-1017.

2015: Tinker Federal Civic Leaders from Rose State College and Tinker AFB natural resources staff planted 48 native trees in Reserve 1 (East) of the Urban Greenway southeast of B-1055.

2016: Tinker Federal Civic Leaders group from Rose State College and Tinker AFB natural resources staff planted 100 eastern redbud bareroot seedlings and two 1-inch eastern redbud trees along the east side of Crutcho Creek west of Cook Ave. Also, in attendance to celebrate Arbor Day were the 72 ABW/CC and CCC and the director of the Tinker Civil Engineering Directorate.

2017: Tinker Federal Civic Leaders group from Rose State College and Tinker AFB natural resources staff planted 50 native trees in Reserve 1 (East) of the Urban Greenway due south of B-1055.

2018: Tinker Federal Civic Leaders group from Rose State College and Tinker AFB natural resources staff planted 50 native trees in Reserve 1 (East) of the Urban Greenway due south of B-1055. The Base Civil Engineer was in attendance at the Arbor Day event.

2019: The grounds maintenance contractor, Trace, plant 8 Oklahoma redbuds at the 72 ABW Headquarters building (Building 1002). In attendance to celebrate Arbor Day were the 72

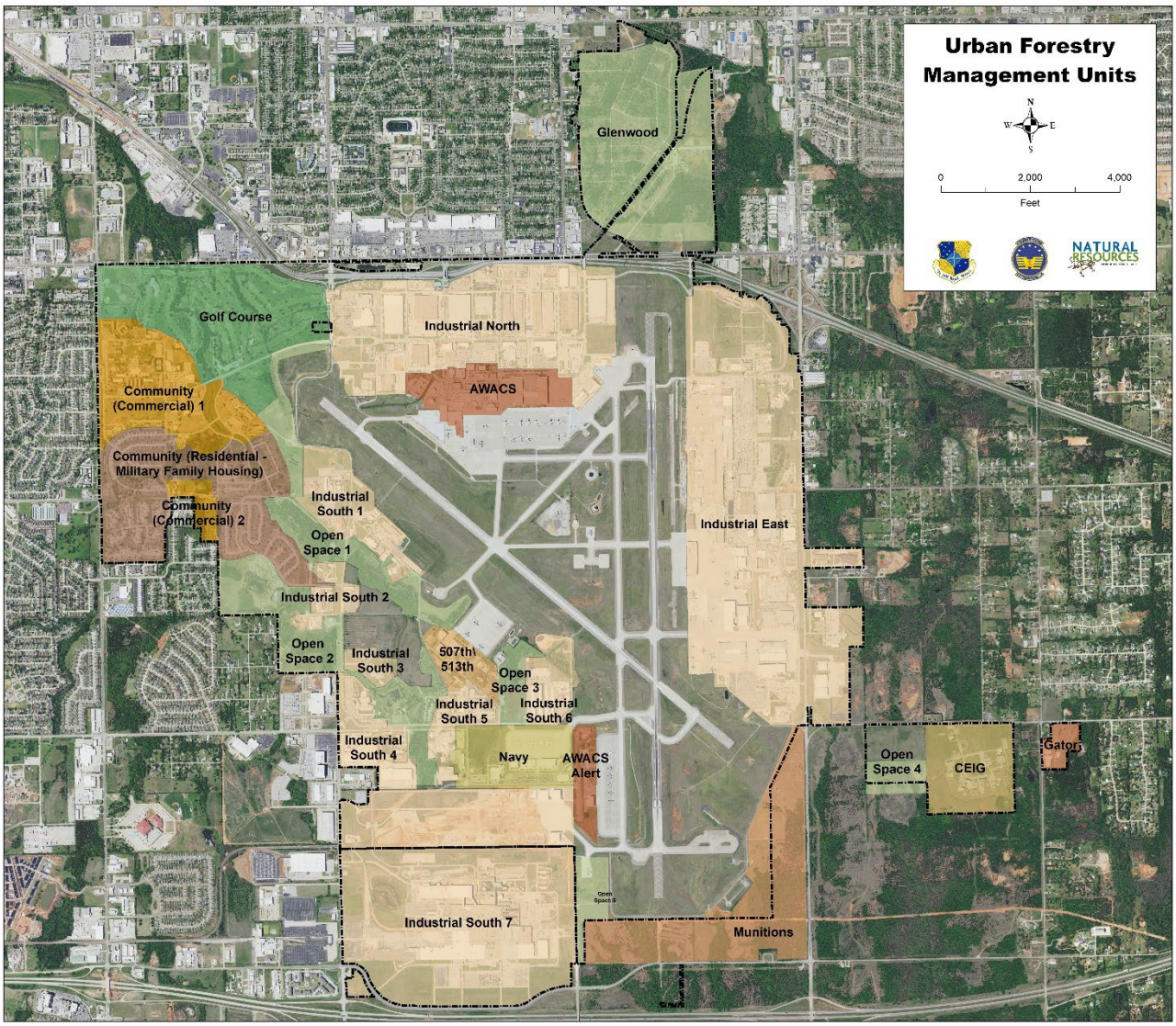
ABW/CC, DS, and CCC, Base Civil Engineer, 72 ABW staff, and CE environmental staff.

2020: No Arbor Day tree planting event was held due to the COVID pandemic.

2021: No Arbor Day tree planting event was held due to the COVID pandemic.

2022: Celebrated Arbor Day with tree planting event on east side of Camp. Approximately 38 cedars were planted as screening by volunteers from AWACs units (552 TRS, 966th, 373 TRS, and 552 AMXS).

2023: Nine trees were planted by Diversified Construction of Oklahoma (DCO) to include the ceremonial tree and reading of the Arbor Day proclamation. DCO, 76 MXSG, Tinker Corps of Engineers, and 72 ABW/CE participated.



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Attachment 2 Tree Planting/Removal Authorization

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 72D AIR BASE WING (AFMC)
TINKER AIR FORCE BASE OKLAHOMA

OCT 30 2009

MEMORANDUM FOR DISTRIBUTION E & ALL ASSOCIATE UNITS
Tinker Support Services
TRACE

FROM: 72 ABW/CE

SUBJECT: Tree Planting/Removal Permit

1. To establish and maintain a healthy urban forest, we must plant the right trees in the right places at the right times, and they must receive proper post-planting care.

2. To facilitate this, Tinker is implementing a tree planting/removal authorization process as an extension to the existing digging permit process. An authorization application must be submitted and approved along with your digging permit prior to tree planting or removal. Applications (attached) and accompanying utility maps are available in the digging permit section in bldg 400.

3. Questions regarding this process should be directed to Mr. John Krupovage, 72 ABW/CEANO, 739-7074.

GENE GALLOGLY, P.E.
Base Civil Engineer

Attachment:
Tree Planting/Removal Permit Application

Tree Planting/Removal Authorization

Tinker Air Force Base Urban Forestry Program (2018 Version)

Authorization No._____

☐ Planting

1. On attached tree list, check boxes and annotate quantities of tree(s) to be planted

2. Planting organization routing symbol or company name:_____

3. Planting organization or company POC and phone number:_____

4. Estimated planting date:_____

5. POC agrees that planting organization or other identified source will ensure tree(s) is watered thoroughly at least once a week during the growing season (April – Sep) for a minimum period of 2 years. POC also agrees to return any government-issued Gator bags (irrigation bags) to Natural Resources Office after use.

For Natural Resources Office Use Only

- ☐ **Location does not conflict with IDP, clear zone, and transitional surface requirements:** Yes / No
- ☐ **Memorial tree?** Yes / No (If yes, inform of coordination requirements)
- ☐ **Tree gator(s) issued:** Yes / No (If yes, number of bags issued):
- ☐ **Tree guard(s) issued:** Yes / No (If yes, number of guards issued):
- ☐ **TAFB Tree Care Policy Guide issued:** Yes / No
- ☐ **Planting location map attached:** Yes / No

- ☐ **Aluminum tag attached to tree**
- ☐ **Updated GIS**

☐ Removal

1. On attached tree list, check boxes and annotate quantities of trees to be removed (include tree tag# if known)

2. Removal organization routing symbol or company name:_____

3. Removal organization or company POC and phone number:_____

4. Reason for removal:_____

5. Estimated removal date:_____

For Natural Resources Office Use Only

- ☐ **Tag #'s:**
- ☐ **Removal location map attached:** Yes / No
- ☐ **Tree to be salvaged/recycled (e.g., lumber, firewood, fish/wildlife habitat improvements):** Yes / No
- ☐ **Assessed to ensure compliance with MBTA:** Yes / No
- ☐ **2:1 replacement trees sited** (No. of trees to be replaced = _____ & attach location map)

- ☐ **Updated Tree Removal Log**
- ☐ **Updated GIS**
- ☐ **Grounds maintenance notified for stump grinding**

Approving Officer Signature:_____ Date:_____

TAFB Urban Forester

Native Tree List

TINKER AIR FORCE BASE

Scientific Name	Common Name	Qty	Planting (P)/Removal (R)
Deciduous Trees (Large)			
☐ *Carya illinoensis*	Pecan		
☐ *Carya texana*	Black hickory		
☐ *Celtis laevigata*	Sugarberry		
☐ *Celtis occidentalis*	Hackberry		
☐ *Fraxinus americana* 'Autumn Purple'	White ash		
☐ *Fraxinus pennsylvanica*	Green ash		
☐ *Fraxinus quadranulata*	Blue ash		
☐ *Gymnocladus dioica*	Kentucky coffeetree		
☐ *Platanus occidentalis*	Sycamore		
☐ *Populus deltoides* (male only)	Cottonwood		
☐ *Quercus falcata*	Southern red oak		
☐ *Quercus macrocarpa*	Bur oak		
☐ *Quercus muehlenbergi*	Chinquipin oak		
☐ *Quercus rubra*	Northern red oak		
☐ *Quercus shumardii*	Shumard's oak		
☐ *Ulmus alata*	Winged elm		
☐ *Ulumus americana*	American elm		
☐ *Ulmus crassifolia*	Cedar elm		
☐ *Ulmus rubra*	Slippery elm		
☐ Other			
Deciduous Trees (Medium)			
☐ *Acer saccharum* 'Caddo'	Caddo maple		
☐ *Betula nigra*	River birch		
☐ *Bumelia lanuginosa*	Chittamwood		
☐ *Maclura pomifera* 'White Shield' or 'Pawhuska'	Osage orange		
☐ *Quercus marilandica*	Blackjack oak		
☐ *Quercus stellata*	Post oak		
☐ *Sapindus drummondii*	Western soapberry		
☐ Other			
Deciduous Trees (Small)			
☐ *Aesculus glabra var. arguta*	Texas buckeye/ Horse chestnut chestnut		
☐ *Cercis canadensis*	Eastern redbud		
☐ *Cercis canadensis*	Eastern redbud		

	'Forest Pansy'	
☐	*Cercis canadensis* var. *texensis* cult. Oklahoma	Oklahoma redbud
☐	*Cornus drummondii*	Roughleaf dogwood
☐	*Cotinus obovatus*	American smoketree
☐	*Crataegus crus-galli*	Cockspur hawthorn/ Red haw
☐	*Diospyros virginiana*	Common persimmon
☐	*Ilex decidua* 'Warren'	Deciduous holly
☐	*Prunus americana*	American plum
☐	*Prunus angustifolia*	Chickasaw plum
☐	*Prunus mexicana*	Mexican plum
☐	*Ptelea trifoliate*	Wafer ash
☐	*Quercus prinoides*	Dwarf chinquipin oak
☐	*Rhamnus caroliniana*	Buckthorn
☐	*Rhus copallina*	Shining/Winged sumac
☐	*Rhus glabra*	Smooth sumac
☐	*Rhus glabra lanciniata*	Cutleaf smooth sumac
☐	*Ribes odoratum*	Clove current
☐	*Sophora affinis*	Eve's necklace
☐	*Vibernum rufidulum*	Rusty blackhaw
☐	Other	
Evergreen Trees		
☐	*Juniperus virginiana*	Eastern red cedar
☐	*Juniperus virginiana* 'Canaert'	Eastern red cedar
☐	*Juniperus virginiana* 'Taylor'	Eastern red cedar
☐	Other	

Attachment 3 TREE CARE POLICY GUIDE
Tinker Air Force Base

INTRODUCTION

In 2005 Tinker AFB natural resources staff conducted a base-wide urban forest assessment. The purpose of the assessment was to obtain a snapshot of the general status and trend of the base's street trees and to identify current tree care management practices and policies, or lack thereof, that were detrimental to the health of Tinker's urban forest. The assessment identified over thirty negative findings.

This policy guide is intended to correct deficiencies identified in the aforementioned assessment. The guide is divided into three sections:

- Section 1 – Policies
- Section 2 – Tree Care Practices Pictorial
- Section 3 – Native Tree List

SECTION 1 – POLICIES

The following policies were developed to correct urban forestry management deficiencies and to provide direction that promotes acculturation of more effective and efficient urban forestry management on Tinker AFB.

Tree Selection:

Policy 1: In accordance with *Presidential Memorandum, Environmentally and Economically Beneficial Practices on Federal Landscaped Grounds,"* April 26, 1994, all trees planted on Tinker shall be native and in accordance with the Tinker AFB Native Tree List. Variances may be granted by the natural resources office under certain circumstances.

Tree Planting/Removal:

Policy 1: A tree planting/removal permit must be obtained from 72 ABW/CEIEC prior to the planting or removing of any tree on Tinker AFB.

Policy 2: A digging permit must be obtained from Civil Engineering prior to planting any tree on Tinker AFB.

Policy 3: For every live urban tree removed on base, two trees (each of which will grow to at least the mature size of the removed tree) shall be planted within the urban forest management unit of the removed tree to offset the loss. Alternatively, tree replacements for woodland/forested areas in unimproved grounds may be calculated based on tree canopy cover as determined by the Tinker natural resources function. Trees may be planted in other management units as determined by the base urban forester. Replacement trees shall not exceed a 1.5 inch trunk caliper.

Tree Maintenance:

Policy 1: Trees on Tinker AFB shall not be pruned by any government or contractor personnel except those with current International Society of Arboriculture (ISA) Certified Arborist credentials. In special cases (as approved by the Tinker natural resources function), tree work may be accomplished by those who have received annual training through the base natural resources office, or other tree care training approved by 72 ABW/CEIEC, and who have demonstrated sufficient tree care aptitude. Tree care shall be in compliance with Tree Care Industry Association standards (Unified Facilities Criteria, UFC, 3-201-02, Landscape Architecture).

General:

Policy 1: All trees planted on Tinker AFB shall be planted and maintained in accordance with Tinker's Urban Forestry Management Procedures.

Policy 2: Notably significant trees (e.g., 100-year old oaks) shall be protected to the maximum extent practicable.

SECTION 2 – TREE CARE PRACTICES PICTORIAL

The following section is intended to supplement the aforementioned policy statements so as to provide a broader and clearer understanding of acceptable and unacceptable tree care practices on Tinker AFB.

Plant with the end in mind

The Siberian elm illustrated above should not have been planted under the street light.

Plant with the end in mind

When choosing a tree to plant on a site, determine what size the tree will be at maturity**.** When trees are planted, they often appear suitable in size for the site. As trees mature; however, they can overgrow their site. The bald cypress in the bottom illustration does not pose any problems today, but as it matures it will become too large for its location. The cedar above was planted too close to the building and has become too large for its location causing potential damage to the structure and making maintenance such as painting difficult.

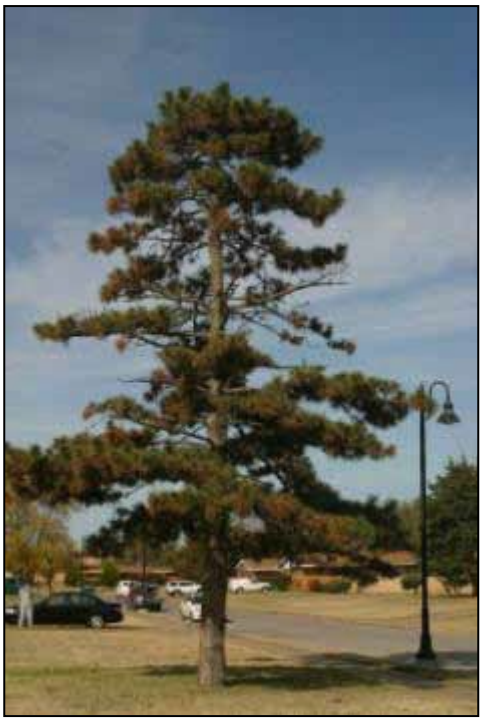
Plant with the end in mind

This elm was planted under power lines and now requires routine pruning and is disfigured. In this case, it would be best to remove the tree.

Make routine checks to ensure trees are not damaging structures
Tree saplings should not be permitted to grow around the base of houses or other structures.

Make routine checks to ensure trees are not damaging structures

As trees mature they could cause structural damage to facilities. Facilities, especially military family housing, should be inspected at least once every 2 years and saplings removed as necessary.



Austrian pine

Atlas cedar (foreground)

Arborvita or Thuja

Do not plant non-native trees

The trees illustrated above are examples of non-native trees that shall not be planted on Tinker AFB. Some non-native trees may be authorized for planting on a case-by-case basis. Most non-native trees are not in character with the Great Plains region. That is, their appearance does not fit with our surrounding natural environment. Tinker AFB lies in a prairie or savannah type region with wooded waterways. Base policy states that landscaping shall aim to simulate our local natural vegetation. In addition to appearance, non-native trees can be invasive and cause economical and environmental harm. Refer to the Tinker AFB Native Tree List (Section 3 of this guide) for trees authorized to be planted on base.

Plant Trees at the Proper Depth

Trees should typically be planted at or slightly above grade. If the tree is planted on heavy clay soils, the top of the root ball should be approximately 2 inches above grade. If trees are planted too deep, they could become stressed and go into decline. The trees illustrated above were planted too high. Mulch washed away, and the roots became exposed stressing the tree.

Plant smaller trees

The tendency is to plant larger trees for the instant impact they offer; however, this often fails. The newly planted trees illustrated above are too large for Tinker's harsh urban soils. It has been documented that if a large (e.g., 4" caliper) and small (e.g., 1" caliper) tree of the same type were planted side by side and given the same care, within a few years the smaller tree will have out-performed the larger tree and surpassed it in size. (Principle and Practices of Planting Trees and Shrubs, International Society of Arboriculture, 1997).

Irrigate new trees for a minimum of two full years

Lack of adequate irrigation is the leading cause for loss of newly planted trees on Tinker AFB. In most cases newly planted trees must be watered at least once a week during the growing season and once a month during the dormant (winter) season. Slow drip-type irrigation, such as that provided by Gator irrigation bags (above) is best.

Do not plant trees too close to sidewalks

When trees are young, they typically don't cause problems with surrounding structures. However, as trees mature, roots at the surface will grow in diameter just as branches do. This can cause nearby structures, such as sidewalks, to crack and heave. As a general rule trees should be planted no closer than 6 feet to a sidewalk or other similar type structure. An alternative is to plant smaller maturing trees that, because of their smaller size, will not damage adjacent structures.

Mulch under tree groves to reduce soil erosion

When trees grow in groves such as the blackjack oaks illustrated above, sunlight is often blocked to an extent that grass will not grow well below the trees. This can lead to soil erosion and exposed root systems stressing the trees. This area should be covered with a layer of woodchip mulch to correct the problem.

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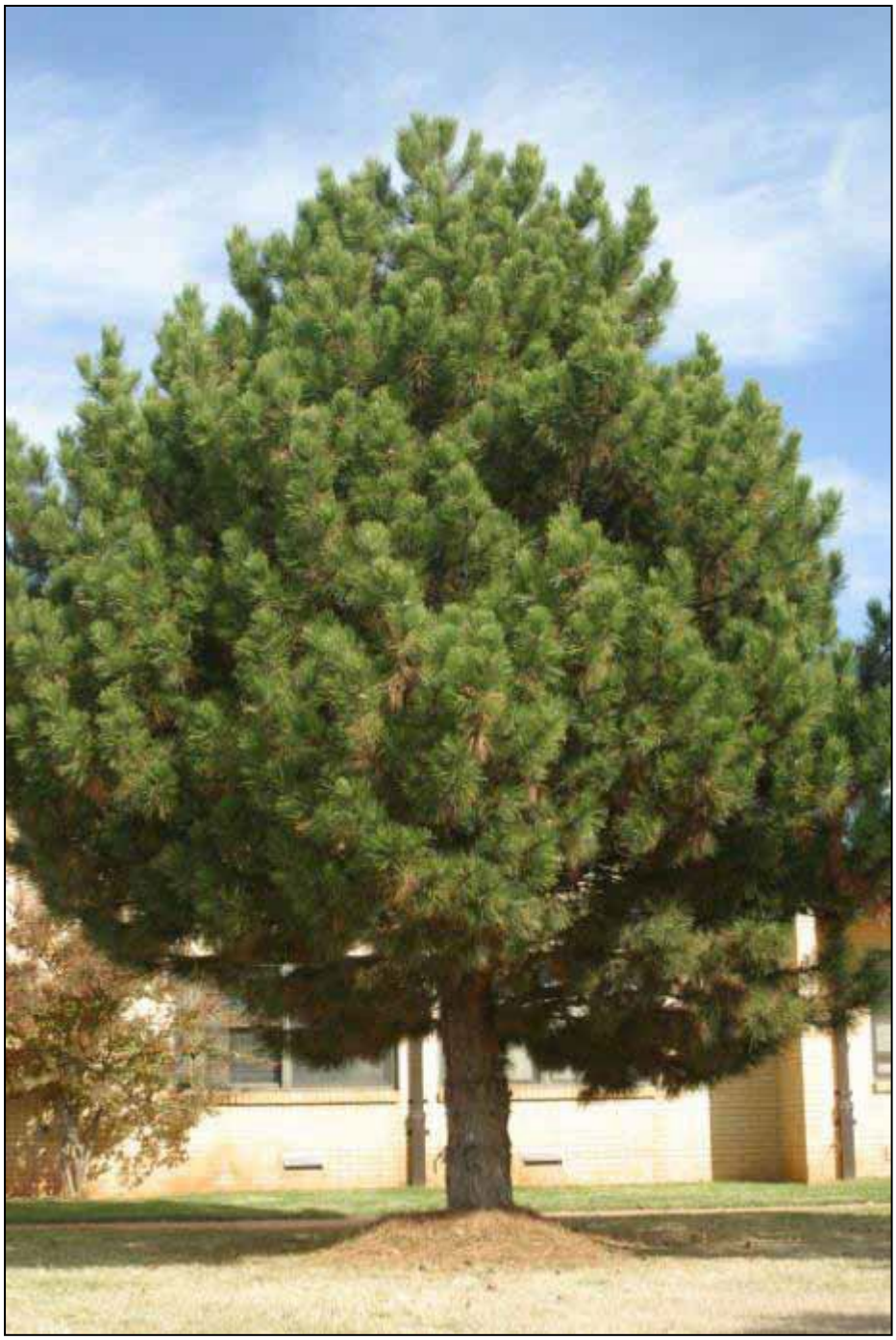


Properly mulch base of trees

Mulch should not be bunched up high around the truck as shown above. In most cases it should be placed at a maximum depth of 3 inches and should not come in direct contact with the trunk.

Use tree guards on trunks

Tree guards protect the base of trees from girdling. The tree on the left has received severe damage from weed trimmers and mowers. The tree on the right shows a properly installed tree guard flush with the ground. As trees mature and develop thicker bark, the guards will no longer be necessary.

Use tree guards on trunks

The illustrations above show improper use of tree guards. Guards should be tacked on trees so that the guards won't be moved by grass trimmers or other equipment and can still expand as the tree matures.

Use caution when working around trees

Grounds maintenance and construction crews must use caution when working around trees. Damage such as that shown above stresses trees and can, in combination with other stressors, cause a tree to go into decline.

Avoid disturbing root zones

This American elm which was in moderate health went into severe decline when a new side walk and planting beds were installed in the area of its root zone. As a general rule, there should not be construction activities done under a tree's canopy.

Avoid disturbing root zones

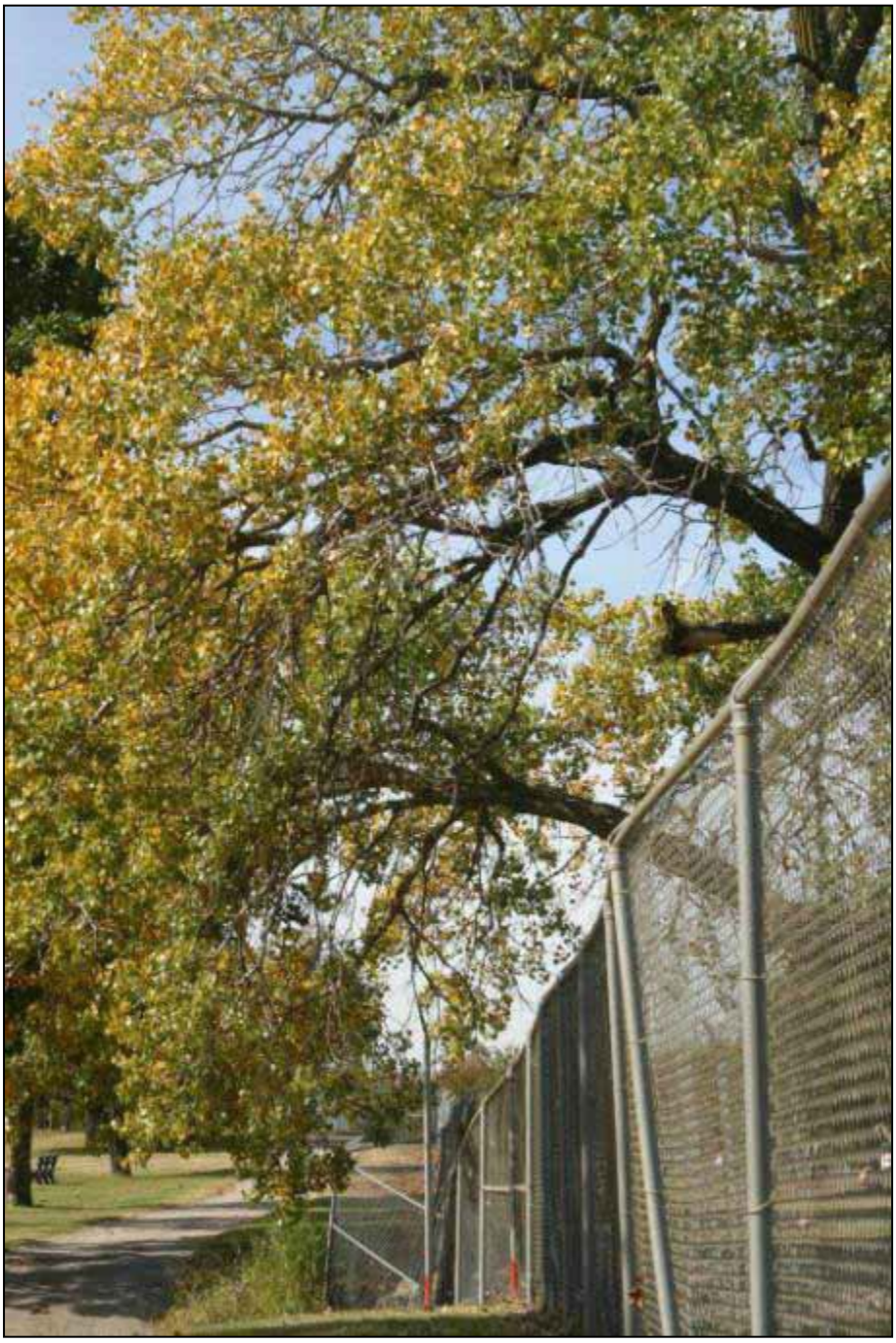
Approximately five feet of fill was placed over the root zones of these trees during new parking lot construction. Disturbance of the root zones in this way should be avoided. Although the trees may not show adverse reaction immediately, they will often begin going into decline and dying back within a few years.

Avoid disturbing root zones

When construction activity is planned in close proximity to trees, each tree must be adequately protected by barricading the root zone area with high visibility construction fencing. When possible, the fencing should be located a minimum of 10 feet beyond the drip line of the tree's canopy. The top illustration shows a properly barricaded tree, while the lower illustrations show improper practices.

Avoid restricted root spaces

Attempt to provide the largest root zone area possible. If a very small area is all that is available, ensure proper drainage with weep holds in the base of the planter. Also, ensure the appropriate small- to medium-sized tree is selected. In the above illustration a large-maturing sycamore was used in this parking lot setting. The majority of the sycamores in this parking lot were stunted, in poor condition, and unattractive.



Be selective when planting trees along secured fence lines

Do not plant trees along perimeter fence lines or secured area fence lines where overarching branches could provide access. Small- to medium-sized trees should be considered and should be planted an appropriate distance away to deter unauthorized access.

Remove saplings which grow at the base of cedars

Unwanted deciduous trees often begin growing under the protected cover of an evergreen cedar. These saplings should be removed every couple of years and the stump sprayed with an appropriate herbicide. In the illustration above, saplings were not removed and in time became larger trees causing the landscape setting to appear unkempt and unattractive.

Minimize planting weak-wooded trees in urban settings

The Bradford pear, which is not authorized for planting on Tinker AFB, is very weak-wooded and has very acute branch angles which make it highly susceptible to wind and ice damage. Often when a large branch is damaged, the entire tree must be removed.

Minimize pruning of cedars

Cedars' natural growth form is pyramidal with branches starting at the ground and should be maintained in this way (above). This reduces maintenance requirements such as pruning, mowing, and weed trimming around the trunk. Although some cedars must be pruned up because of their proximity to buildings or other structures, as a general rule cedars should not be pruned as shown on the left.

Ensure proper tree selection over high use areas

Because of their tendency to drop twigs and branches and sappy substances, cottonwoods and sycamores are not good trees to be planted over driveways where vehicles will be parked. Also, fruit-bearing trees such as plums should not be planted over pedestrian areas.

Remove tree stakes and guy wires promptly

Leaving supporting guy wires and hoses on for too long can permanently damage trees. The illustration above shows what happened to a golden raintree which had been staked and guyed about 7 years earlier. Most trees' bracing systems can be removed after the first growing season. Some larger evergreen trees like cedars may require longer periods of support.

Employ proper pruning practices

When branches are pruned, stubs should not be left. If a small branch needs to be removed, it should be removed back flush with the branch it originates on without damaging the branch collar. The illustration above shows improperly pruned branches.

Employ proper pruning practices

Top left shows improper pruning cut. The stub will not allow the cut to callous over and heal properly. Mistletoe, a parasite, has begun to grow at this location. The lower right shows a correct pruning cut that is healing properly.

Employ proper pruning practices

Do not top trees. Topped trees are unattractive, and new branches that develop have weak branch angles which make them susceptible to storm damage. If trees are causing conflicts, it is generally best to remove them.

SECTION 3 – NATIVE TREE LIST

The following is a list of trees approved for planting on Tinker AFB. This list is not exhaustive – other trees native to the local ecoregion may be used upon approval.

Scientific Name	Common Name
Large Deciduous Trees	
Carya illinoensis	Pecan
Carya texana	Black hickory
Celtis laevigata	Sugarberry
Celtis occidentalis	Hackberry
Fraxinus americana 'Autumn Purple'	White ash
Fraxinus pennsylvanica	Green ash
Fraxinus quadranulata	Blue ash
Gymnocladus dioica	Kentucky coffeetree
Platanus occidentalis	Sycamore
Populus deltoides (male only)	Cottonwood
Quercus macrocarpa	Bur oak
Quercus muehlenbergi	Chinquipin oak
Quercus rubra	Northern red oak
Quercus shumardii	Shumard's oak
Ulmus alata	Winged elm
Ulmus crassifolia	Cedar elm
Ulmus rubra	Slippery elm
Medium Deciduous Trees	
Acer saccharum 'Caddo'	Caddo maple
Betula nigra	River birch
Bumelia lanuginosa	Chittamwood
Diospyros virginiana	Common persimmon
Maclura pomifera 'White Shield' or 'Pawhuska'	Osage orange
Quercus marilandica	Blackjack oak
Quercus stellata	Post oak
Sapindus drummondii	Western soapberry
Small Deciduous Trees	
Aesculus glabra var. arguta	Texas buckeye/Horse chestnut
Cercis canadensis	Eastern redbud
Cercis canadensis 'Forest Pansy'	Eastern redbud
Cercis canadensis var. *texensis* cult. Oklahoma	Oklahoma redbud
Cornus drummondii	Roughleaf dogwood
Cotinus obovatus	American smoketree
Crataegus crus-galli	Cockspur hawthorn/Red haw
Ilex decidua 'Warren'	Deciduous holly
Prunus americana	American plum
Prunus angustifolia	Chickasaw plum
Prunus mexicana	Mexican plum
Ptelea trifoliate	Wafer ash
Quercus prinoides	Dwarf chinquipin oak
Rhamnus caroliniana	Buckthorn
Rhus copallina	Shining or Winged sumac

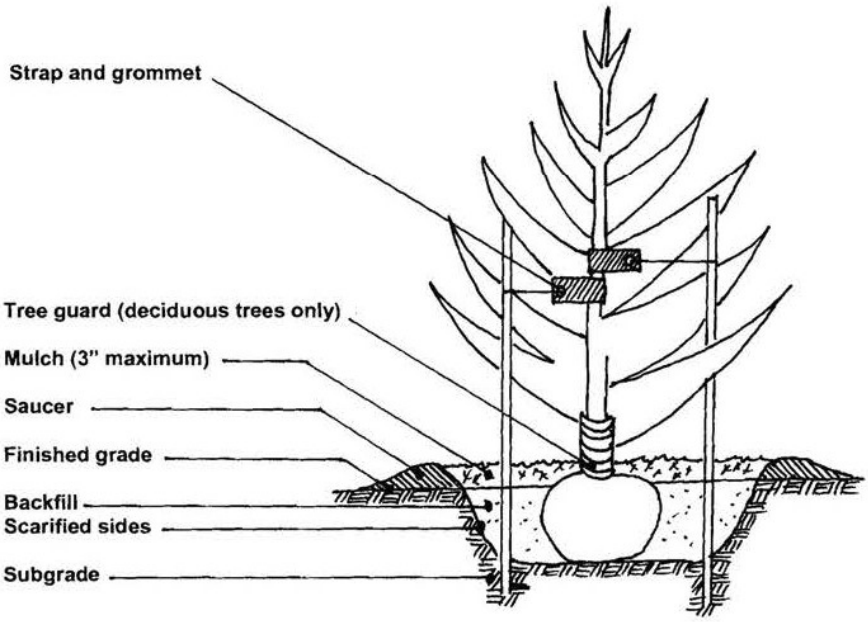
Rhus glabra	Smooth sumac
Rhus glabra lanciniata	Cutleaf smooth sumac
Ribes odoratum	Clove current
Sophora affinis	Eve's necklace
Vibernum rufidulum	Rusty blackhaw

Evergreen Trees

Juniperus virginiana	Eastern red cedar
Juniperus virginiana 'Canaert'	Eastern red cedar
Juniperus virginiana 'Taylor'	Eastern red cedar

Attachment 4 TREE PLANTING/STAKING & ROOT ZONE PROTECTION

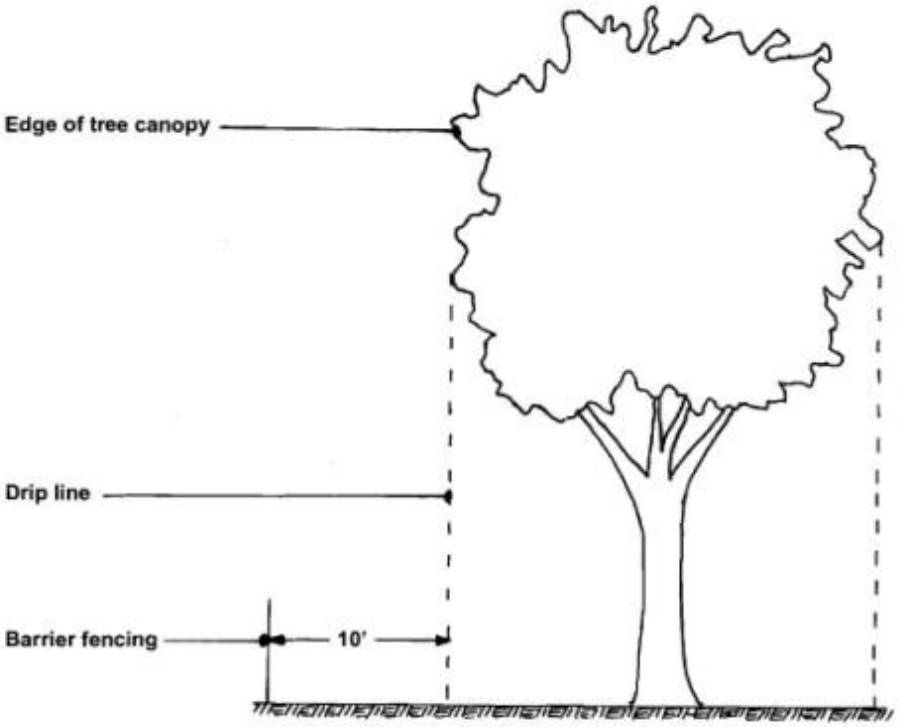
Tree Planting / Staking



Notes:

- Planting pit shall be three times the size of the root ball
- Backfill shall be the original soil dug from the planting pit
- For smaller trees, two T-posts shall be installed – north and south sides of the tree
- Use three equally spaced T-posts for evergreen trees over 10 feet in height
- Without breaking root ball, completely remove wire basket before planting
- Without damaging root ball, completely remove all burlap & twine
- Remove any twine, wiring, or other materials from trunk and limbs
- For circling roots, multiple vertical slits shall be made down the sides of the root ball
- Excessive tamping and compaction of soil around root ball shall be avoided
- No trunk wrapping shall be installed
- Tree shall be straight (vertical) from all directions
- In clay soils, top of root ball shall be at 2 inches above finish grade; otherwise top of root ball should be at grade
- Tree guards shall be flush with ground & tacked to trunk opposite the expandable opening
- Trees shall be watered in thoroughly after planting to eliminate voids/air pockets in the backfill

Root Zone Protection



Note:

- Barrier fencing shall be erected at 10' beyond the drip line

Attachment 5 URBAN FORESTRY ANNUAL CHECKLIST

URBAN FORESTRY ANNUAL CHECKLIST		
	ACTIVITY **[Completed annually unless otherwise noted]**	**TARGET COMPLETION DATE**
	1. T-posts and guy lines function properly	April – September (monthly)
	2. T-posts and guy lines have been removed from trees that have been planted for approximately one year [provide map to Grounds Maintenance Quality Assurance Evaluator (QAE) for action, as needed]	January
	3. Identify trees requiring irrigation for upcoming growing season. Provide map to Grounds Maint. QAE (add trees to revolving 2-yr irrigation GIS layer)	February
	4. Monitor trees under 2-year irrigation establishment period to ensure irrigation is being accomplished	April – September (every 2 weeks)
	5. Following 2-year irrigation establishment period, retrieve irrigation bags.	September
	6. Beaver protection wire is intact and not interfering with tree growth (provide findings and map to USDA Wildlife Services, if needed)	January
	7. When irrigation bags have been removed from trees near water, beaver protection wire has been installed simultaneously (provide map to USDA Wildlife Services, if needed)	February
	8. Tree guards are in place and adequately protecting trees	May

URBAN FORESTRY ANNUAL CHECKLIST		
	ACTIVITY **[Completed annually unless otherwise noted]**	**TARGET COMPLETION DATE**
	9. Tree tags are in place, legible, and not being consumed by tree (1/4 of base tree population inspected annually)	November
	10. All newly planted trees (in-house, contract, individuals, etc.) have been pruned following their 3rd, 6th, and 9th growing seasons [provide map of pruning needs to Grounds Maintenance Quality Assurance Evaluator (QAE)]	May
	11.All newly planted trees have been tagged, geo-referenced, and loaded in natural resources GIS database (includes tree data such as tree height, caliper, spread, etc)	November
	12.Inspect all construction sites once a month to ensure tree protection/management is in compliance with Tinker AFB Urban Forestry Management Procedures (report deficiencies to NR manager)	October-September
	13.Identify trees basewide requiring lifting/pruning (to include hazard trees) and provide map of findings to Grounds Maintenance QAE for job order or scheduling for possible end-of-year funding	May
	14.Identify trees basewide needing to be removed and provide map of findings to Grounds Maintenance QAE	May
	15.Distribute Tree City USA data call by 1 Nov and complete/submit Tree City USA/Growth Award application package(s) to Oklahoma Department of Agriculture by 31 Dec	31 December

URBAN FORESTRY ANNUAL CHECKLIST		
	ACTIVITY **[Completed annually unless otherwise noted]**	**TARGET COMPLETION DATE**
	16. Evaluate trees in Transitional and Approach-Departure Surfaces to ensure none are breaching imaginary surfaces (provide findings and map to Airfield Management and Grounds Maintenance QAE)	September (biannually)
	17. Provide map to Grounds Maintenance QAE showing where tree replacements (i.e., trees being planted to meet 2:1 replacement policy) are to be planted (include tree species, sizes, and sources of trees)	May
	18. Review Tree Permit File and conduct the following as necessary: Working with NR GIS Specialist, update Urban Forestry layer in NR GIS (i.e., tree plantings, removals, etc.) Follow-up on permits which required 2:1 tree replacement to ensure it was accomplished	As Needed
	19. Prepare (cut, split, stack, bundle) firewood for annual/semi-annual (every 2 years) firewood sale	1 December