

City of Tucson

STREET LANDSCAPE MAINTENANCE MANUAL



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STREET LANDSCAPE MAINTENANCE MANUAL

REFERENCES:

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GENERAL REQUIREMENTS

Proper landscape management is the City of Tucson's primary tool to provide for the orderly maintenance and protection of City assets, especially the urban forestry. Trees and vegetation promote the health, safety, welfare, and quality of life for the residents of the City. These guidelines help to assure that these resources will retain their significant contribution to the landscape and continue to define the Great Desert City of Tucson.

This Street Landscape Maintenance Manual establishes standards and specifications to accompany the implementation of:

- Pima County/City of Tucson Standard Details and Specification for Public Improvements;
- current standards established by the American National Standards Institute (ANSI) Z133.1: Safety Requirements for Pruning, Trimming, Repairing, Maintaining, and Removing Trees and for Cutting Brush;
- the International Society of Arboriculture (ISA), and
- OSHA Safety Rules and Regulations (OSHA 29 CFR 1910 relating to safety standards when pruning near electrical and communication power lines); and
- City of Tucson Municipal Code Part II: Tucson Code: Chapter 25: Streets and Sidewalks Article II: Duties and Prohibitions Sec. 25-53. Duty to trim.

The owner, occupant, or agent in charge of any lot, piece, or parcel of land within the corporate limits of the city shall not allow any tree, shrub, or other form of vegetation of any kind upon such property or upon the right-of-way, street, or alley adjoining the same to extend over or under the sidewalk space or roadway in such street or alley in such a manner as to interfere with the reasonable use of such street, sidewalk, or alley for pedestrian or vehicular traffic of any kind or to obstruct the view or light distribution of traffic-control devices or luminaries. It shall be the duty of every such owner, occupant or agent in charge to keep such trees, shrubs, or any other vegetation trimmed in such manner that the same will not interfere with the reasonable use of such street or alley for pedestrian or vehicular traffic.

(1953 Code, ch. 24, § 16; Ord. No. 6195, § 3, 3-11-85; Ord. No. 8327, § 2, 7-5-94)

GOALS OF THIS MANUAL

- Ensure maximizing the health and preservation of existing tree canopy cover over streets and trails maintained by City of Tucson Department of Transportation, Streets Division.
- Provide acceptable standards of maintenance for City-owned street trees.
- Increase survivability of trees in the urban environment by implementing best management practices for urban landscape care.

OUTCOMES OF THE GOALS

- Safe, clean, and neat public areas
- Properly-irrigated landscape areas within and adjacent to public rights-of-way
- Transportation corridors (i.e., streets, trails, alleys, etc.) that are pedestrian and bicycle comfortable. This goal will be measured by the shade provided to reduce the urban heat island and the pedestrians'/bicyclists' safety.

PRUNING AND MAINTENANCE OF TREES AND SHRUBS

Maintenance procedures are generally performed on a routine based on flowering cycle, seasonal changes, and as needed. Seasonal maintenance generally includes pruning, fertilizing, adjustment of irrigation scheduling, and applying herbicides/pesticides. As-needed maintenance is generally removing/replacing dead and dying plants and damage done due to natural climate-related causes or human accidents.

PRUNING PRACTICE

OBJECTIVES

- Pruning at proper time and method
- Having tree or shrub respond by providing appropriate new growth and form
- Maintain safety by eliminating and reducing risks of limbs falling and/or interfering with overhead and underground utilities
- Enhance civic appearance and/or improve views

Trees naturally grow with little need for maintenance or pruning. Trees in urban environments require management to remove hazardous branches, improve tree structure, and enhance form to maintain safety. Understanding a plant's response to pruning will assist in achieving a healthy and aesthetically pleasing plant within the urban context.

PRUNING SEASON

- Winter: Hard-wood trees (non-flowering trees); trees flowering in summer
- Spring: Spring flowering trees, pruning after flowers have faded; or to maximize growth, early spring just before new growth
- Summer: Prune to remove hazardous limbs, diseased limbs, and storm damage
- Fall: No tree pruning

TOOLS

- Utilize clean and disease-free equipment
- < 1 inch diameter limbs = by-pass, hook and blade
- 1–2 inch diameter limbs = loppers
- < 6 inch diameter limbs = saws with fine teeth, curved blades
- > 6 inch diameter limbs = chain saws
okay (DO NOT use chain saws for limbs less than 6 inches in diameter)

Above, left to right: Loppers, curve blade saw
Below: Electric chain pole saw



TYPES OF PRUNING

Structural

Properly maintained and trained trees seldom require structural pruning. Structural pruning encourages the development of one strong leader for strength and branching patterns.

Deadwooding

Removal of dead, weak, and dying branches.

Cleaning

Removes dead, diseased, broken, low-vigor, and weakly-attached branches.

Reduction

Decreases the height and/or spread of a tree. This has also been referred to as “drop-crotch pruning.”

Thinning

Reduces the density of live branches, reduces weight, increases light and air movement through the tree, stimulates inner foliage, enhances appearance, and increases storm resistance.

Raising

Removes lower branches to provide vertical clearance for pedestrians, vistas, and vehicles.

Prohibited

Do not remove more than one-third of foliage in any one season.

Do not top trees for any reason. Topping, or lion-tailing, is not a selective pruning technique, but an arbitrary cutting of limbs in an attempt to reduce the tree crown.



Existing



Cleaning



Reduction



Raising



Thinning



Prohibited: Topping

PRUNING TECHNIQUES

BRANCH COLLAR

Each cut should be made at the enlarged area of the branch where it meets the trunk (the branch collar).

EQUIPMENT

Should be clean and sharp. When cleaning a diseased tree, tools should be dipped in a 10% bleach solution after each cut.

LARGE LIMBS

Limbs larger than 2 inches, require a 3-cut process:

Step A – Undercut limb

Step B – Remove entire limb, leaving stub

Step C – Final cut, remove stub



Branch Collar



Large Limb Pruning, Step A: Undercut



Large Limb Pruning, Step B: Leave stub



Large Limb Pruning, Step C : Remove stub

PRUNING TECHNIQUES

INCORRECT CUTS

Flush Cut

Results in larger wounds and jeopardizes the tree's ability to form a barrier between the damaged tissues and healthy parts of the tree.

Leaving Branch Stub

Prevents callus from forming over cut.



Correct Cut



Incorrect: Branch stubs and bark peeling



Incorrect: Flush Cut



Incorrect: Flush cuts and branch stubs



Incorrect: Branch Stub

TRAINING JUVENILE TREES

Proper structural pruning is essential in the development of a young tree to develop strong structure and desirable form.

BASIC PRINCIPLES

- Growth habits can be changed with each cut.
- Structurally strong trees require little corrective pruning as they mature.
- Improper large cuts can create large structural damages.

Establish a strong structural trunk with well-spaced branches

For single-trunk trees, eliminate co-dominant stems.

Determine lowest permanent branch based on site-specific requirement (i.e., for pedestrian, bicycle or vehicular clearance).



TREE STAKING AND PLANTING

Trees do not need to be routinely staked.

Stake only if they cannot stand without support, or are threatened by wind or other inclement weather.

Use only 2 stakes at right angles to the prevailing winds.

Place stakes outside of the root ball and irrigation well.

Height: Place ties at the lowest point on the trunk at which it will not bend.

Ties:

- Large trees: tie wire and webbing or tie wire and hose
- Small trees: horticultural tape. Twist wires to tighten. Keep enough slack to allow the trunk and tie to move as a unit

Cut stakes below the tree canopy to prevent wounds to the branches.

Inspect and loosen wires periodically.

Remove stakes as soon as possible, usually within the year.



Tree Staking



Tree Staking Multi-trunk



Detail of tie wire and hose

TOPPING OF TREES

Topping is exclusively PROHIBITED. There are alternatives to reduce a tree's height or spread. Seek a certified arborist for assistance and advise.

Stress

Topping stresses trees by reducing 50–100% of the leaf-bearing crown and forcing rapid growth of multiple shoots, compromising the tree's structural strength. This makes the tree vulnerable to insect and disease infection.

Decay

Decay can occur due to multiple cuttings below the branch crown causing an inability for the tree to heal effectively leading to tissue decay.

Sunburn

Sunburn can occur due to open crown exposure to the sun without leaves to absorb the sunlight. Bark sunburn can lead to bark splitting, cankers, and the death of the tree.

Hazardous Conditions

Hazardous conditions are created due to instability and weakness of branches that are prone to breakage, especially during windy conditions.

Loss of Aesthetics

Topping causes a loss of aesthetics due to loss of natural branching form and topping leaves unsightly stubs.

Expense

Additional expense is incurred as repeated pruning will be required to remove weakened branches that have become a hazard.



Prohibited: Rapid growth of multiple shoots caused by topping



Prohibited: Improper cuts and topping

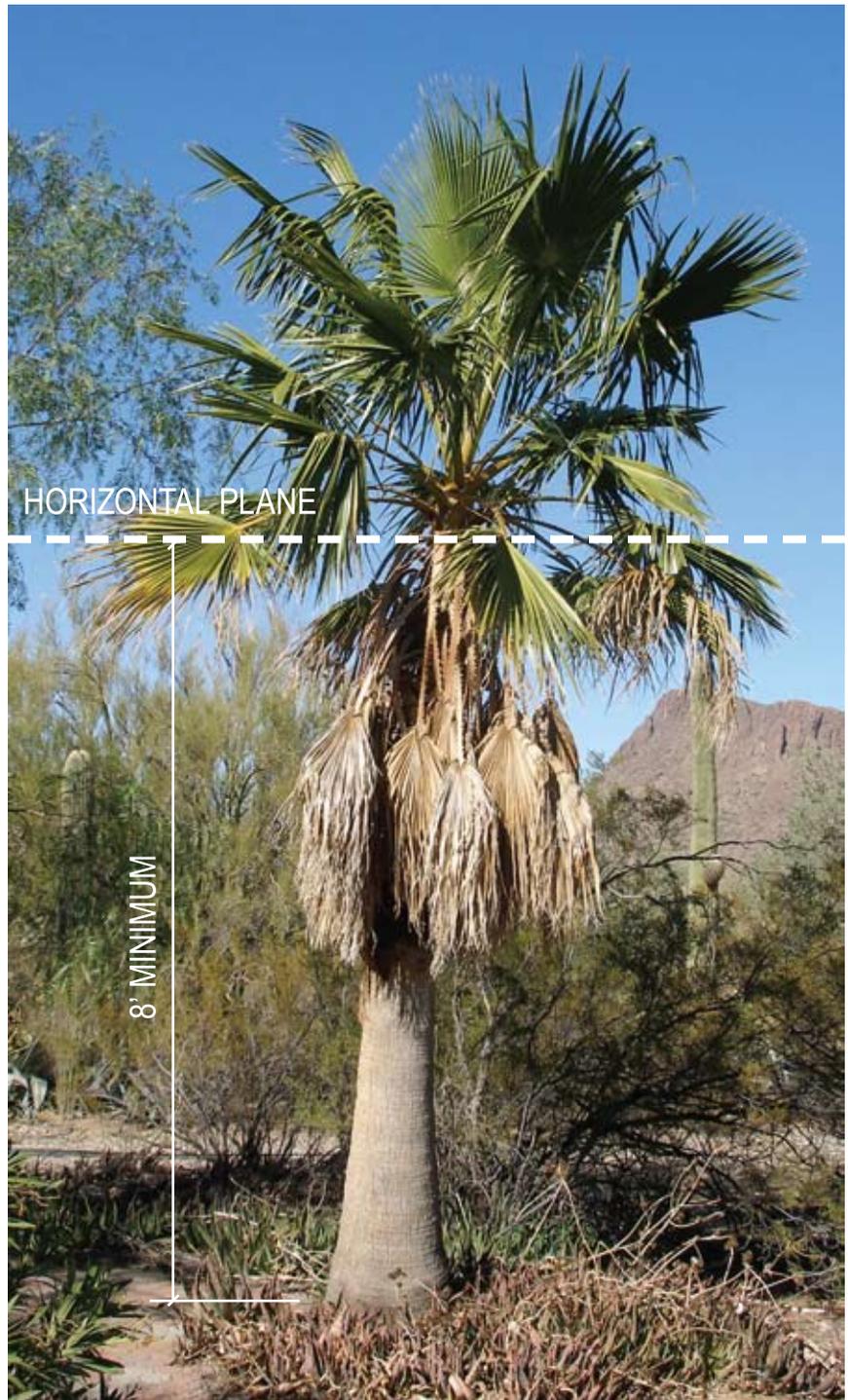
PALM TREE PRUNING

Palm trees need to be pruned to remove hazardous and dead fronds.

Healthy fronds should be removed to a minimum clearance of 8 feet.

Healthy fronds should be removed only if below horizontal plane.

Do not remove healthy fronds above horizontal plane.



MAINTAINING SHRUBS

WHEN TO PRUNE SHRUBS

- Depending on growth rate, annually or semi-annually
- Grown too tall for area
- Safety and visibility issue (i.e., blocking line of sight)
- Grown too woody or rangy
- Dead flower stalks
- Blocking access, walk- ability or bikeability

Time

- Fall or Spring
- Flowering plants – after they have bloomed

Equipment

- Hand held pruning equipment
- If using power shears initially reduce height then selectively remove branches with hand pruners]

REDUCING SHRUBS

- Will depend on species
- Reduce shrubs applying tree reduction principles, considering plant structure and stability

DO NOT prune into geometric form (i.e., balls, squares, rectangles, etc.)

- exception is specialized topiary requirement or if creating a screen or hedge



Incorrect: Ignoring plant shape when pruning



Correct: Pruning plant to natural shape



Correct: Cassia pruning



Prohibited: Pruning shrubs in geometric forms

GROUNDCOVERS, CACTI AND SUCCULENTS

MAINTAINING GROUNDCOVERS

Planting areas to be kept free of weeds and trash.

Maintain groundcovers similar to shrubs, selectively prune to reduce size, eliminate excessive growth and dead or dying portions of the plant.

CONTROLLING INVASIVE SPECIES – BUFFELGRASS (PENNESITUM CILIARE)

Maintain right-of-way areas free of buffelgrass in conjunction with keeping the areas weed-free.

Removal to be done by herbicide and/or manual removal.

Best time for spraying is during active growth period, usually after the monsoons or early spring after the winter rains.

Manual removal can be done at any time.



Prohibited: Buffelgrass infestation



After buffelgrass has been removed

MAINTAINING CACTI AND SUCCULENTS

Monitor growth and inspect for disease and problems.

Maintain appropriate irrigation schedule to prevent over watering and root rot.



Appropriate irrigation



Water stain

HAZARDOUS PLANTS

PLANTS IN THE CITY RIGHT-OF-WAY OR EASEMENTS

Approval is needed to remove any plants in the City right-of-way or easements.

Trees with frequent limb breakage or trunk rot are considered hazardous.

HAZARDOUS PLANTS/TREES – WHEN TO REMOVE

Plants or trees should be removed when:

- They are diseased or infested and they jeopardize surrounding plants.
- 50% or more of the plant or tree, including foliage, branching, trunk or root structure, is decayed or dead.
- Trees that are structurally unsound are next to structure(s), vehicular or pedestrian areas.

The condition of the tree or plant is to be evaluated by City of Tucson Department of Transportation landscape architect and/or arborist.



Diseased tree

GENERAL MAINTENANCE

FERTILIZERS AND USAGE

Generally, mature trees do not need fertilizing.

Supplemental fertilizing may be required to improve the nutrient level of the soil or correct iron chlorosis or other micro-nutrient deficiencies.

Applications will be scheduled in accordance with the National Arborist Association Standard for Fertilizing Shade and Ornamental Trees, the National Arborist Association Standards, and in accordance with the manufacturer specifications

WEED CONTROL

Weed control may include both mechanical and chemical treatments.

Use of pre-emergent prior to raining seasons will cut down on future maintenance requirements.

Chemical herbicide treatments can only be done by certified applicators utilizing proper techniques and chemical concentration mixtures.



Weed: London rocket

PLANT DIAGNOSTICS

The initial diagnostic is a visual inspection for abnormalities. Check for wounds, sun burn, and canker.

Check condition of leaves:

- Dead = environmental or mechanical problem
- Curled = insect, herbicide, or viral infection
- Yellowing = mineral deficiency

Check the root structure. Black or brown may indicate root rot.

Signs of soil borne fungus:

- Wet wood
- Slime flux
- Leaf spotting
- Blotchy leaf coloring

Soil samples should be tested by a recognized facility or laboratory.



Iron chlorosis

INSECT RELATED PROBLEMS

Inspect for harmful pests, such as: aphids, scale, spider mites, thrips, white flies, beetles, weevils, and borers.

Signs of insect problems include leaves that are blotched, deformed, stunted, dusty appearance, discolored, skeletonized, defoliated or wilted.

Include an integrated pest management system when possible.

Pesticide application will be by a licensed applicator.



Aphids

WATERING

Utilize *Landscape Watering by the Numbers - a Guide for the Arizona Desert*.

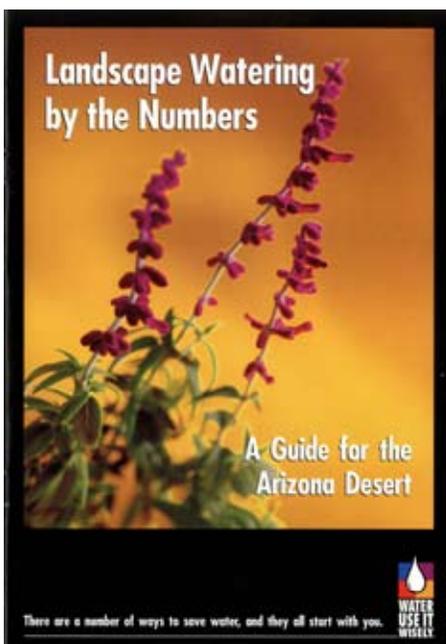
Utilize diverse watering sources such as reclaimed, water harvesting, and potable.

Inspect and check irrigation systems periodically, at a minimum, once a year.

Utilize a smart controller with or without weather stations.



Lady bug larvae



How Much & How Often <small>Water to the outer edge of the plant's canopy and to the depth indicated. Watering frequency will vary depending on season, plant type, weather and soil.</small>		Seasonal Frequency — Days Between Waterings				Water This Deeply (Typical Root Depth)
		Spring Mar - May	Summer May - Oct	Fall Oct - Dec	Winter Dec - Mar	
Trees	Desert adapted	14-30 days	7-21 days	14-30 days	30-60 days	24-36 inches
	High water use	7-12 days	7-10 days	7-12 days	14-30 days	24-36 inches
Shrubs	Desert adapted	14-30 days	7-21 days	14-30 days	30-45 days	18-24 inches
	High water use	7-10 days	5-7 days	7-10 days	10-14 days	18-24 inches
Groundcovers & Vines	Desert adapted	14-30 days	7-21 days	14-30 days	21-45 days	8-12 inches
	High water use	7-10 days	2-5 days	7-10 days	10-14 days	8-12 inches
Cacti and Succulents		21-45 days	14-30 days	21-45 days	if needed	8-12 inches
Annuals		3-7 days	2-5 days	3-7 days	5-10 days	8-12 inches
Warm Season Grass		4-14 days	3-6 days	6-21 days	15-30 days	6-10 inches
Cool Season Grass		3-7 days	none	3-10 days	7-14 days	6-10 inches

These guidelines are for established plants (1 year for shrubs, 3 years for trees). Additional water is needed for new plantings or unusually hot or dry weather. Less water is needed during cool or rainy weather. Drip run times are typically 2 hours or more for each watering.

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