CITY OF EL PASO, TEXAS
AGENDA ITEM DEPARTMENT HEAD'S SUMMARY FORM

DEPARTMENT: **Development and Infrastructure Services**

AGENDA DATE: **Introduction: May 15, 2007, Public Hearing June 5, 2007**

CONTACT PERSON/PHONE: **Barry Russell, Assistant Director, Parks and Recreation – 541-4292**

DISTRICT(S) AFFECTED: City-wide

SUBJECT:

An ordinance amending Title 9, Health and Safety, of the El Paso City Code by adding Chapter 9.11, Tree Care, which will define the care, destruction and planting of trees located on city property and to prevent certain hazards and nuisances created by trees located on private property, the penalty being as provided in Chapter 1.08 (General Penalty) of the El Paso City Code.

BACKGROUND / DISCUSSION:

This is a companion ordinance to the proposed revisions to Landscape regulations in Title 18; and sets forth the duties of the City Arborist, and regulates the care and maintenance of trees in public and private property. Also attached is the "Policy and Standards Manual for Tree Care."

PRIOR COUNCIL ACTION:

N/A

AMOUNT AND SOURCE OF FUNDING:

N/A

BOARD / COMMISSION ACTION:

Recommended for approval by the El Paso Tree Board on Jan. 16, 2007

********************REQUIRED AUTHORIZATION**********************

LEGAL: (if required) _____ **FINANCE:** (if required) _____

DEPARTMENT HEAD: Norman C. Merrifield

APPROVED FOR AGENDA:

CITY MANAGER: ___Patricia D. Adauto, Deputy City Manager_____ **DATE:** _____

07 MAY 10 AM 8:39
CITY CLERK DEPT.

ORDINANCE NO. _____

AN ORDINANCE AMENDING TITLE 9, HEALTH AND SAFETY, OF THE EL PASO CITY CODE BY ADDING CHAPTER 9.11, TREE CARE, WHICH WILL DEFINE THE CARE, DESTRUCTION AND PLANTING OF TREES LOCATED ON CITY PROPERTY AND TO PREVENT CERTAIN HAZARDS AND NUISANCES CREATED BY TREES LOCATED ON PRIVATE PROPERTY, THE PENALTY BEING AS PROVIDED IN CHAPTER 1.08 (GENERAL PENALTY) OF THE EL PASO CITY CODE.

WHEREAS, trees are desirable in our community because they provide shade, beauty, land and wind protection; and,

WHEREAS, trees also filter air, muffle noises, protect soil, create habitat for birds and small animals; and,

WHEREAS, large healthy trees make El Paso more attractive to visitors and foster economic development; and,

WHEREAS, it is necessary for the protection of the general public to require private property owners to abate nuisances and pests that are harmful to trees; and,

WHEREAS, it is necessary for the protection of the general public to require private property owners to abate hazardous conditions created by trees located on private property; and,

WHEREAS, the El Paso City Council finds that the promotion of the preservation, education, protection and replacement of trees located on City property is of a benefit to the public health, safety and welfare and promotes economic growth,

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF EL PASO, TEXAS:

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1. That Title 9 (Health and Safety) of the El Paso City Code be amended by adding the following Chapter:

Chapter 9.11, Tree Care

A. Purpose. The purpose of this Chapter is to promote and protect the public health, safety, and general welfare by providing for the regulation of the planting, maintenance, and removal of trees located on public property and to prohibit nuisances or hazards caused by trees located on private and public property within the limits of the City of El Paso.

B. Applicability. This ordinance applies to all trees located within public property and to trees located on public or private property that create a hazardous condition or nuisance to the general public.

C. Arborist. The Arborist shall work with the Parks and Recreation Department and the Streets Department to accomplish all duties that may be required to comply with this Chapter of the City Code.

D. Definitions: The following definitions apply under this Chapter:

1. ARBORICULTURAL SPECIFICATIONS MANUAL is the manual containing regulations and standards for the planting, maintenance, and removal of trees located on public property. The Manual shall be approved by the Developing Coordinating Committee.

2. DAMAGE shall include, but not be limited to, the uprooting of a tree, severance of the root or branch system, the compaction of soil around a tree, a substantial change in the natural grade above a root system or around a trunk, or excessive pruning of living tissue.

3. PUBLIC PROPERTY shall mean all grounds owned and controlled by the City of El Paso and where the City has the responsibility of maintenance.

4. PUBLIC TREE shall mean any tree with at least two-thirds of its trunk on public property.

5. TOPPING is defined as the severe reduction of the tree's size using heading cuts that shorten limbs or branches back to a predetermined crown size or limit with the result of reducing the natural canopy or disfigure the tree.

6. TREE shall mean any self-supporting woody perennial plant typically having a mature trunk(s) diameter of at least three inches measured at 12 inches above grade.

7. UTILITY shall mean public utilities, businesses or organizations in the business of supplying communications services, electrical energy, gas, heat, steam, water, or sewage disposal and treatment.

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E. Arborist. The City Arborist shall

a. administer the Tree Care Ordinance,

b. administer the Community Forestry Action Plan,

c. assist the Tree Board in carrying out the duties and responsibilities as specified in the Tree Board Ordinance and

d. administer and, in consultation with the Tree Board, periodically review and revise as necessary the provisions of the Arboricultural Specifications Manual.

F. Trees Located on Public Property

1. Destruction or Damage of Trees Prohibited. It shall be unlawful for any person to intentionally damage, cut, carve, abuse, poison or otherwise harm or injure any tree located on public property. This section does not apply to persons authorized by the City who are taking actions necessary for the preservation and safety of the public or the proper care or maintenance of any tree in accordance with the Arboricultural Specifications Manual. The City of El Paso and its authorized agents, employees, and contractors shall have the authority to trim or remove any trees within public property.

2. Maintenance of Trees.

a. The City may plant, prune, maintain and remove trees, plants and shrubs within the lines of all public property, as are necessary to preserve the aesthetic value of such public areas and for the health and safety of the public and trees. Such planting, maintenance or removal will be done in accordance with Arboricultural Specifications Manual.

b. Utilities. No public or private tree other than those species that may attain a mature height no greater than 10 feet below an existing overhead utility wire may be planted under or within 10 feet of any overhead utility wire on public property. Tree limbs that grow near high voltage electrical conductors shall be maintained clear of such conductors in compliance with the franchise agreements between the City and the utility company.

c. Tree Topping. No tree located on public property shall be topped. Trees severely damaged by storms or other causes, or certain trees under utility wires or other obstructions where other pruning practices are impractical may be crown reduced where necessary to protect the public health, safety and welfare.

d. Tree protection zone. Whenever city department plans to do construction work around any public tree, proper safe guards and root protection zones as outlined in the Arboricultural Specifications Manual must be approved by the City Arborist.

e Jurisdiction over public property. The Directors of the Street Department and Parks Department or his or her designee shall have the power to perform accepted tree care in accordance with the Arboricultural Specifications Manual. If any tree or any part thereof is in unsafe condition, or is injurious to the common good, or to the sewer pipes, pavements or improvements, or is infested by disease or insects which are dangerous to other trees, the City Arborist may remove such trees or part thereof, or spray such tree, or order such tree, or part thereof removed.

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G. Trees Located on Private Property

Public nuisances on private property. It is unlawful for a property owner to cause, create, keep, or otherwise permit transmissible disease infections or insect infestations of trees on private property. Transmissible disease infections or insect infestations of trees are declared a nuisance.

a. *Authority of City.* The city may order that the property owner or agent of the owner of any tree(s) located on private property, infected by transmissible disease or infested with insects, treat or allow the city to treat the infected or infested tree(s) located on private property. Upon complaint or observation meriting further inspection. The city shall have the authority to enter upon private lands to make field inspections, including the removal of specimens for any laboratory analysis that may be necessary to determine the presence of a transmissible infection or infestation.

b *Issuance of Order.* When the City determines that an infectious disease or insect infestation is present, the City shall assess the need for immediate action to curb the spread of the infection or infestation to city trees. If the infection or infestation warrants immediate

action to prevent spread to city trees, the city may order the property owner to immediately treat, remove or dispose of the infected or infested trees, or allow the city to do so. If the infection or infestation does not warrant drastic action, the city may order that the property owner or agent of the owner treat, or remove and dispose of the infected or infested trees within a specified time, but not less than 30 days. The city's order shall be issued by certified mail (return receipt requested). If the owner or agent of the owner does not satisfactorily complete the necessary work within the time allowed by the city's order, the city may enter upon the property to treat, to remove, or to destroy the infected or infested tree(s) by approved practice.

c. *Property Owner Appeal of Order.* If the Property Owner wishes to appeal the City's order on the basis that the tree is not infested or infected, such appeal must be received by the Director of the City's Street Department within ten days of receipt of the City's order. The appeal must be in writing. Once the appeal is received by the Director, the Director shall notify the Appeal Board so that the Board may schedule a date for the appeal to be heard. The Appeal Board shall consist of the Director or Department Head, or their designee, of each of the following departments: Building, Planning and Inspections Department, Street Department, Parks and Recreation Department, Environmental Services and the City County Health Department. An official from the Texas Forest Service may serve in an ex-officio member, without the right to vote, nor shall they be counted for purposes of establishing a quorum. The Director of the Street Department will be responsible for notifying the Property Owner of the appeal date, providing all the necessary documents to the Board, and conducting the appeal. The Board shall render a decision based on all the evidence and documentation presented. The decision of the Board shall be final. The Director of the Street Department shall notify the property owner in writing of the Board's decision.

d *City Abatement of Infestation.* If the property owner fails to complete any work required to be done by the City within the time specified, the City may cause the work to be done and the cost of the same shall be assessed against the property owner. Any notice given pursuant to this section shall state that if the work required is not done within the time specified, the city will cause the same to be done at the expense of the property owner. A statement of the costs incurred by the city shall be mailed to the property owner and such statement shall be paid within thirty (30) days of the date of mailing thereof. If any property owner is unable to pay the cost of such work within thirty (30) days, he may enter into an agreement for the payment of the same in monthly installments.

If the property owner fails to pay the costs incurred by the city or fails to enter into an agreement for payment of the costs and pay such cost in accordance with the agreement, civil action by the city to recover the costs may be pursued and the city attorney is hereby authorized, without further authorization from city council, to institute any civil suit necessary to recover the costs incurred by the City, to include costs associated with the civil suit.

H. Any person who shall cause, create, keep, or otherwise permit a nuisance declared under this Chapter or any person who intentionally damages, cuts, carves, abuses poisons or otherwise harms or injures any tree located on public property shall be guilty of a misdemeanor, and upon conviction thereof shall be fined as provided in Sections 1.08.010, 1.08.020 and 1.08.030. Each day that such nuisance shall continue shall constitute a separate offense; provided, the imposition of a penalty hereunder shall not abrogate the right of the city to cause the abatement of any nuisance

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2. Except as expressly amended herein, all other provisions of Title 9, Health and Safety, of the City Code of the City of El Paso shall remain in full force and effect.

EXECUTED this _____ day of _____, 2007.

THE CITY OF EL PASO

_____
John Cook
Mayor

ATTEST:

_____
Richarda Duffy Momsen
City Clerk

APPROVED AS TO FORM:

_____
Lupe Cuellar
Assistant City Attorney

APPROVED AS TO CONTENT:

_____
Norman C. Merrifield, Ed.D., Director
Parks and Recreation Department

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Policy and Standards Manual for the Care of Trees and Shrubs in the City of El Paso

Photograph by: Oscar S. Mestas

Winner of the 2001 Texas Community Forestry Award presented to the City of El Paso for protection and preservation of the State Champion *Pinus halapensis* during re-development and construction of the San Antonio Street transit plaza project.

City of El Paso, Texas

Brent Pearson – City Arborist
Street Department

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Document Name:STREETS/1/BEST MANAGEMENT PRACTICES POLICY FOR THE CARE OF TREES
Document #: 23381
Author_Id: JFLO

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POLICY AND STANDARDS MANUAL ("Manual")
CITY OF EL PASO, TEXAS

1.0 INTENT AND PURPOSE

These policies and standards are issued through the El Paso Tree Board to establish specific technical regulations, standards and specifications for care and maintenance of trees and shrubs located on City of El Paso. ("City") right of way or property owned by the City, hereinafter referred to as public property, and to achieve the City's tree and shrubs preservation and protection goals. These goals are intended to provide consistent care and serve as indicators to measure achievement in the following areas:

- Ensure and promote preservation and expansion of the existing tree and shrub canopy cover on public property.
- Provide standards of maintenance required for trees and shrubs located on public property.
- Provide for the protection and replacement of trees and shrubs located on public property.
- Establish criteria for determining when a tree or shrub is unsafe and a possible threat to public health, safety and welfare.
- Increase the survivability of trees before, during and after construction conducted on public property by providing and implementing protection standards and best management practices.
- Enhance the quality of life in El Paso.

2.0 PROJECT ARBORIST REQUIRED

A qualified Arborist or Project Arborist knowledgeable in current arboriculture practices (to be known as the Project Arborist) shall be part of the team of professionals planning, designing and supervising any public improvements or projects on property owned or controlled by the City of El Paso which may affect established trees or shrubs or the placement of new trees or shrubs.

The Project Arborist may be a City employee or a qualified arboricultural professional. A Project Arborist shall be familiar and comply with the requirements of this manual to increase the survivability of trees and shrubs before, during and after construction conducted on public property by providing and implementing the protection standards and best management practices contained in this Manual.

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3.0 TREE AND SHRUB PLANTING SPECIFICATIONS

These planting specifications shall apply for all new trees and shrubs within City right-of-ways, parks or other public property. City Departments, contractors, and Project Arborists shall incorporate the following specifications into bid documents and/or contracts for projects on property owned or controlled by the City of El Paso.

4.0 PLANTING STOCK AND MATERIALS

All plants and trees installed on public property shall conform to the most current edition of the American Standard for Nursery Stock ANSI Z60.1.

4.1 Plant Quality.

It is the contractor's responsibility to supply stock that meets the American Standard for Nursery Stock ANSI 760.1 (or latest edition) and to comply with Policy and Standards for the care of trees in the City of El Paso as described in this Manual.

4.1.1
Plants shall be sound, healthy, vigorous, and free of plant disease and insect pests and their eggs.

4.1.2
Root balls of delivered plants shall not be contaminated with non-desirable weeds to include but not limited to nut sedges, common bermuda grass, chaff weed, or their seeds, stolons, underground plant parts such as rhizomes or tubers and other plant parts that could germinate, or escape and spread to the surrounding landscape.

4.1.3
Container stock shall be grown for at least 8-months in containers in which plants are delivered and shall not be root bound or have girdling roots.

4.1.4
Container stock shall also not be contaminated with non-desirable weeds (see 4.1.2).

4.1.5
Trees shall not have been topped, headed or skinned.

4.1.6
Trees with broken tops, branches, injured trunks, girdling roots, broken root balls, signs or symptoms of disease, insect infestation, contaminated soil with non-desirable weeds, unnatural form and general poor quality as determined by the Project Arborist not meeting or exceeding the standards above shall be rejected.

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4.1.7
The Project Arborist shall inspect and verify, in writing, that all plant material to be installed on the site meets or exceeds the above standards.

4.2 Miscellaneous Materials
The following materials are recommended unless otherwise specified:

4.2.1
Tree stakes - Support stakes shall be treated 2-inch diameter wood poles or metal tee posts, two stakes per tree or equivalent approved by City Arborist. No cross brace shall be used. After installation, stakes shall be trimmed so that branches clear the top of the stake.

4.2.2
Tree Ties - Such as VIT cinch-tie™ system, or equivalent approved by the City Arborist shall be used and installed in a figure eight fashion to support the tree to the stakes. The use of wire through a garden hose or similar method is not to be used.

4.2.3
Mulch – Preferred organic mulches shall be screened untreated wood chips 1/2- to 1-inch in size, shredded wood chips, cypress bark or pecan shells. Preferred inorganic mulch shall be ¾" gravel. Other organic or inorganic mulches such as crusher fines or chat, or larger bark or gravels may be used if approved by the City Arborist. All mulch should be kept at least two inches away from the trunk and shall be applied to each tree, mulches shall be spread to a minimum 2-inch depth no more than 4 inches deep and out to the edge of the planting area.

4.2.4
Root Control Barriers - Barriers will be used along all public sidewalks, as indicated on approved plans and drawings. An 18-inch or greater linear barrier such as Deep Root® UB18-2 control barrier or equivalent shall be used. A 10-foot length shall be placed on center with the tree and on the sidewalk side only. Root barrier boxes shall not be used.

4.2.5
Mower guards - For trees in turf areas requiring regular mowing, the tree stem shall be protected with ArborGard+® or equivalent as approved by the City Arborist.

4.2.6
Tree Grates- Where tree grates are specified metal tree grates shall be used. Grate sizes shall meet the minimum area requirements for tree pit sizes as specified in "Planting Site Preparation" below. All tree grates shall be mounted in frames inset into a concrete foundation within the sidewalk or surface material and shall be flush with the surrounding surface.

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5.0 PLANTING SITE PREPARATION

5.1 Soil Preparation and Conditioning

All construction debris including wood chips, pavement or concrete, and rocks over 2-inches in diameter shall be removed from planting areas to a minimum of 12-inch depth.

5.2 Tree Pits or Planting Holes

5.2.1
Confined planters or sidewalk areas shall have a minimum width of 4 feet. All construction debris and rocks over two inches shall be removed to a minimum of 36-inches deep x the width of the planting area. Scarify the sides of the excavated pit. Soil beneath the root ball shall be compacted to prevent settling.

5.2.2
In all other cases, minimum planting area and volume for tree pits per tree. (For size of tree species consult, the City of El Paso Plant list).

Small tree- 25 square feet of surface area and 75 cubic feet of soil.

Medium tree- 48 square feet of surface area and 144 cubic feet of soil.

Large tree- 100 square feet of surface area and 300 cubic feet of soil.

5.2.3
Excavate planting holes with slanting sides. Do not disturb soil at bottom of planting holes. Make excavations twice as wide as the root ball diameter and as deep or slightly less (two inches) than the distance between the top-most root in the root ball and the bottom of the root ball. Alternatively, excavate the hole slightly wider than the root ball and place the root ball in the hole so the top-most root is even with or slightly (2 inches) higher than the surrounding landscape grade. Then, loosen the surrounding soil out to a diameter equal to twice the diameter of the root ball. Finally, push the loosened soil toward the root ball to fill the hole.

Note:
It is strongly encouraged to increase planting area whenever possible, by designing continuous planting areas versus individual tree pits. Use of structural or engineered soils is also recommended and encouraged to increase rooting volume under paving stones and impervious surfaces.

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5.3 Drainage

5.3.1
Planting percolation test. A percolation test is required to ensure there is adequate drainage for planting new trees and shrubs. A minimum of one test per development site is required. Additional tests may be required by the City Arborist. Fill planting hole with water and observe and record per hour rate of water dispersal from the hole. If percolation rate is less than 2 inches per hour, one or more of the following mitigation measures must be implemented.

5.3.2
Mitigation for locations with poor drainage:

5.3.2.1
Install a French drain. The trench shall radiate away from the tree and be a minimum of 18-inches in depth filled with drain rock. The grade shall fall away from the tree trunk.

5.3.2.2
Install drain tiles or perforated pipe directing water away from the tree.

5.3.2.3
Install a drain chimney at the bottom of the planting pit, a minimum of 4-inches in diameter and filled with medium sand or fine gravel to ensure percolation of all water from the filled planter pit. Auger bore drain holes to penetrate hardpan, caliche, or clay a minimum of 12-inches into undisturbed pervious soil. Angle the boring as close to vertical as possible.

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6.0 PLANTING THE TREE

6.1 Depth

To determine the proper depth of the root ball, place the tree in the hole and lay a pole or shovel handle across the original grade - the top of the root ball with the top most root exposed should be at grade or slightly higher (1 to 2-inches).

6.2 Container grown or balled and burlap.

6.2.1
Remove tree from the container, inspect the root system. There should be little or no circling roots visible on the outside of the root ball.

6.2.2
If there are thin circling roots: make three to four vertical cuts 1/2-inch deep around root ball, spread the bottom roots out if necessary.

6.2.3
If any circling roots are larger than 1/5 the size of the stem, the tree shall be automatically rejected. (See "Plant Quality" section 4.1)

6.2.4
If planting balled and burlap, remove all burlap, wire, string or other foreign material completely or at a minimum from the top 1/2 of the root ball.

6.3 Placing the Tree

Center the tree in the hole making sure it is level and plumb, and rotate the tree positioning its best side in the direction of principal view. In street tree plantings direct the main branches away from the street side, if possible.

6.4 Slope

When planting on a slope, the top-most main root in the root ball shall be even with the grade on the uphill side of the tree. Site soil will need to be added on the downhill side to cover the sides of the root ball and to construct the soil berm to hold water. The amount of soil added on the downhill side will depend on the slope and size of the root ball.

6.5 Filling the Hole

Fill the hole halfway up with original soil, and gently tamp out air pockets with a pole or shovel handle. Add about 1-inch of water, and let drain. Fill the rest of the hole to grade, water the fill soil, and let drain. Do not place backfill soil over the top of the root ball. (Amended soil shall not be used unless specified or approved by the City Arborist.)

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6.6 Staking

When required by the project specifications or when deemed necessary by the City Arborist. Place the stakes beyond the edge of the root ball (drive them into undisturbed ground until solidly anchored), and avoid contact with the branches or roots. If in a windy area, set the stakes in a plane at right angles to the wind. Remove the nursery stake. Loosely place two ties in a figure eight around the trunk, as low as needed to hold the tree upright and attach to the stake. Wooden stakes shall be trimmed so that the branches clear the top of the stake and metal stakes must be driven into the soil so that the top of the stake does not interfere with any branches. Do not install a cross-brace. Staking is not always necessary, it should be determined on a case-by-case basis whether to stake or not. Stakes should be able to be removed after one growing season.

6.7 Berm, Mulch and Water

In non-turf areas, form a soil berm 3 to 4-inches high X 6-8 inches wide at the outermost edge of the root ball. Place 1 to 2-inches of mulch over root ball and berm, keeping the mulch away from the trunk a minimum of 2-inches. Fill the berm with water. Exception: if the tree is irrigated by drip system no berm is needed.

6.8 Turf Areas

No turf shall be allowed within a minimum of three-foot radius from the new tree stem for a minimum of three years. Existing turf shall be removed to comply with this requirement when necessary. In turf areas only organic mulch shall be placed on top of the root ball and planting area and replenished as needed. The mulch shall not be touching the tree stem. The installation of a tree guard is required for new trees in turf areas.

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7.0 PLANTING IN DIFFICULT SOIL CONDITIONS

Occasionally, tree planting must occur in poor or difficult soil where standard-planting techniques will result in poor-to-average performance or mortality of the tree (such as unique or unusual substrate, slope, soil volume, restrictive physical or chemical properties, poor drainage, etc.). In this case, the Project Arborist must investigate alternative solutions to enable long-term tree growth. Alternative planting specifications or plans that vary from these standards for normal conditions contained in this Manual shall be submitted to the City Arborist for approval prior to installation. Request for the use of alternative or non-specified soils, such as engineered, amended or structural urban tree soil mix, shall be submitted with the manufacturer's specifications for product use and a physical sample for approval by the City Arborist prior to installation.

8.0 MAINTENANCE OF TREES AND SHRUBS LOCATED ON PUBLIC PROPERTY AND THE AMERICAN NATIONAL STANDARDS INSTITUTE

This section establishes the minimum standard of care and maintenance for trees and shrubs located on public property. These standards apply to employees of all City Departments and contractors who are engaged in the business of installing, repairing, maintaining, or preserving trees and shrubs located on public property owned or controlled by the City of El Paso. These standards are derived from the American National Standards Institute (ANSI A300 standards Parts 1-6) and the Best Management Practices (BMP) companion publications which are the standards set and used by the Arboricultural Profession.

Copies of the ANSI standards and BMP publications are available electronically at http://www.ansi.org/ or http://www.isa-arbor.com/home.aspx under publications. They are also available for inspection at the office of the City Arborist.

If special situations require a variance from these standards, written approval from the City Arborist must be obtained by the responsible City department head.

9.0 SAFETY STANDARDS

City departments and City contractors shall comply with safety requirements as set forth in ANSI Z133.1-2000 for arboricultural operations.

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10.0 PROHIBITED ACTS

Improper maintenance may constitute a prohibited act as defined by the El Paso Municipal Code, **blank** and a violation which may be subject to penalty. Prohibited maintenance practices for trees located on public property are listed below.

10.1 Excessive Pruning means:
Removing in excess, one-fourth (25 percent) or greater, of the functioning leaf, stem or root area. Pruning in excess of 25 percent is injurious to the tree and is a prohibited act. Excessive pruning typically results in the tree appearing as a 'bonsai', 'lion's-tailed', 'lolly-popped' or overly thinned unbalanced crown. Excessive pruning may include the cutting of any root two (2) inches or greater in diameter and/or severing in excess of 25 percent of the root system of any tree or shrub. Excessive pruning also includes removal of the leaf or stem area predominantly on one side, topping, or excessive tree canopy or crown-raising. Exceptions are granted when clearance from overhead utilities or public improvements is required or to abate a hazardous condition or a public nuisance.

10.2 Topping:
Topping is the reduction of a tree's size using indiscriminate internodal cuts or heading cuts that shorten limbs or branches back to a predetermined crown limit. This is considered excessive pruning. Exceptions are granted to preserve or restore the crown after storm damage, as approved by the City Arborist.

10.3 Tree Injury Prohibited:
Climbing and pruning practices shall not injure the tree except for the pruning cuts.

10.4 Other prohibited actions:
Taking any action foreseeable leading to the death of a tree or shrub or permanent damage to its health, including but not limited to excessive pruning, cutting, girdling, poisoning, improper irrigation, unauthorized relocation or transportation of a tree, or trenching, excavating, altering the grade, soil compaction, or paving within the drip line area of a tree.

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11.0 STANDARDS FOR PRUNING

All work on trees and shrubs located on public property by city employees or city contractors shall be in accordance with the most current edition of the following industry standards:
Standard Practices for Tree Care Operations - ANSI A300 (Part1) and the corresponding Best Management Practices (BMP) companion publication. (Sample specifications can be found in the Best Management Practices (BMP) companion publication to the ANSI A300 Part 1 Standard Practices, Pruning).

11.1 Pruning Mature Trees

The four types of pruning that may be required for use on mature trees located on public property in order to meet pruning objectives are:

11.1.1
Cleaning - The selective removal of one or more of the following parts: dead, diseased, and/or broken branches. Cleaning is done at anytime to reduce risk and remove the possibility of the movement of decay, insects or disease from dead or dying branches into the rest of the tree.

11.1.2
Thinning - The selective removal of live branches to reduce crown density. Thinning is focused at the outside edge of the crown because the majority of small branches are in that area. Proper thinning retains crown shape and should result in an even distribution of branches and foliage throughout the crown.

11.1.3
Raising - The selective removal of branches to a predetermined height to provide vertical clearance for pedestrian and vehicular traffic.

11.1.4
Reduction - The selective pruning to decrease height and/or spread of the crown. Consideration shall be given to the ability of a species to tolerate this type of pruning. This type of pruning is done to minimize the risk for limb failure, for utility line clearance, or to remove vegetation away from buildings or other structures.

11.2 Pruning Young Trees

Young tree pruning shall be limited to the removal of dead, broken, or diseased branches at the time of planting. All branches shall be retained on the lower trunk for a minimum of two years. Young trees shall be inspected and pruned if needed during the second year after planting, and henceforth be inspected annually to determine if any corrective pruning is needed in order to improve health and structure. A central leader or leaders, as appropriate, should be developed. Strong properly spaced scaffold branches should be selected and maintained with inferior branching removed.

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11.3 Timing of Pruning
To reduce the probability of insect infestation, disease or infection, the following seasonal restrictions apply, except when public safety is a concern.

11.3.1
All species - Do not prune during or soon after the initial flush of shoot growth in the spring (March to April).

11.3.2
Deciduous trees (leafless in winter) - Best pruned November- February before bud break.

11.3.3
Hazardous conditions - Any species may be pruned any time of the year for abatement reasons.

11.4 Tree Workers
Pruning should not be attempted by construction or contractor personnel, but should be performed by a qualified tree care specialist or certified tree worker, according to guidelines contained within the pruning section of this Manual.

Note:
If a tree has been damaged by injury or disturbance, delay pruning until deadwood becomes evident (typically 1-3 years after injury). Crown cleaning (see 11.1.1) is then recommended.

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12.0 FERTILIZING STANDARDS

This section outlines performance standards for fertilizing and applies only if fertilizing is needed. The reason for fertilizing is to supply nutrients determined to be deficient to achieve a clearly defined plant management objective. This objective should be accomplished in the manner most beneficial to the plant and the environment.

12.1 Specifications

Fertilizing, if needed, shall be performed to the ANSI A300 (Part2)-2004 Fertilization Standards and the companion BMP publication.

12.1.1
Material and Rates- For best results the fertilizer ratio should be adjusted based on local knowledge, site conditions, species, age, and/or condition of the tree.

12.1.2
Application - For surface and subsurface applications the fertilizer formula shall be a slow-release nitrogen fertilizer with a minimum 50 percent WIN (Water Insoluble Nitrogen). Nitrogen may be applied at a rate of between 2 and 4-pounds of actual nitrogen per 1000 square feet and should not exceed 6 pounds of actual nitrogen per 1000 square feet within 12 months.

12.1.3
Sampling - Extraordinary cases may require soil and tissue sampling to correct target deficiencies. Foliar applications, trunk injections or implants shall only be used when soil application of fertilizer is impractical or ineffective in achieving fertilization objectives. All products shall be used in accordance with manufacturers' recommendations.

12.1.4
Salt index - Use of fertilizers with a salt index of more than 50 is not permitted. (Reference the companion publication, table 2, page 9 of the Best Management Practices for Tree and Shrub Fertilization. ANSI A300 part 2)

12.1.5
Timing - Timing should not be detrimental to tree health. Best results are derived from applications made during the growing season. Apply fertilizer between May through September for best results.

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13.0 WATERING SCHEDULE

The watering of existing and new trees shall follow these minimum standards. Periods of extreme heat, wind or drought may require additional application of water beyond the amounts recommended in these specifications. The method and amount that is applied may vary depending upon soil composition, heat, wind, nearby competition such as turf or ground cover, periods of abnormal rainfall or in poorly drained soils.

13.1 Frequency

13.1.1
New trees - During the establishment period (1-3 years) trees/shrubs shall be watered thoroughly to their root ball depth as frequently as needed but no less than 2 times per week for the first twelve months and no less than once per week for the next twenty four months.

13.1.2
Mature established trees - All established low and medium water use trees (as characterized by the approved City of El Paso Tree and Plant List) shall be deeply soaked at least once a month throughout the year to thoroughly wet the soil profile to the drip line of the tree to a minimum depth of 12 inches and preferably to a depth of 18 inches. Additionally high water use trees shall be deeply soaked twice a month during the spring windy season and hot summer months before monsoon season arrives.

13.2 Watering Methods

One or more of the following methods of water application may be utilized to meet watering requirements unless unique site circumstances require specification of a specific installation or method of irrigation as approved by the City Arborist.

13.2.1
Automated Watering Systems - All newly planted trees and shrubs shall be provided with one of the following automatic watering systems using drip irrigation. All irrigation installations are to be consistent with current State and City regulations. A continuous loop or loops of drip tubing or individual distribution lines with emitters circling around the trunk of the tree/shrub shall be installed as follows:

13.2.1.1
For new trees / shrubs in 15 to 20 gallon containers, the loop or line of emitters shall be placed at the mid-point between the trunk and the edge of the root ball and a second loop or emitter array shall be placed 12 inches outside the edge of the root ball in native soil.

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13.2.1.2
For new trees /shrubs in 24 to 36 inch box containers and greater, a second loop of drip tubing is required at a point just beyond the root ball on native soil and a third loop shall be placed 18 inches outside the second loop or line of emitters.

13.2.1.3
Tree irrigation systems shall be designed to accommodate installation of additional loops as the tree matures.

13.2.1.4
Micro bubblers rated in gallons per hour. One or more bubbler heads mounted on flexible tubing are to be placed adjacent to or on top of the root ball sufficient to soak an area twice the diameter of the root ball around the tree/shrub.

13.2.2
Hand watering or manually operated systems are required for trees and shrubs that must be watered to ensure tree survival during the course of construction until automatic irrigation is installed or reactivated, or as a supplement to automatic irrigation systems during the initial establishment period of new trees, temporary failure of the automatic system during periods of exceptional stress or as may be directed by the City Arborist.

13.2.2.1
Flood watering - Newly installed trees must be 'flood or basin watered' on top of the root ball to allow the water to infiltrate through the root zone.

13.2.2.2
Subsurface - Injections may be substituted for basin application in hard, compacted soils or steep hillsides.

13.2.2.3
Soaker hose - Slow, deep watering using a garden-type soaker hose.

13.2.2.4
Amount - For all trees the volume of water applied at each irrigation cycle shall be sufficient to thoroughly infiltrate the soil profile of the rooting area to a minimum depth of 12 inches and a preferred depth of 18 inches.

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14.0 SOIL IMPROVEMENT AND REMEDIATION

Soil amendments are not permitted unless specified in an approved landscape design or as directed by the City Arborist.

14.1 Soil compaction

Compaction of the soil is the largest single factor for the decline and failure of landscape plantings. Every effort shall be taken to avoid compaction of soil porosity within existing landscaped areas in a defined tree protection zone during construction or in areas slated for landscaping. During construction 90% of the damage to the upper 18 inches of soil occurs with the first pass of heavy equipment and cannot be naturally reversed.

14.1.1
Mitigation - When required for mitigation of prohibited actions the following standards for improvement of damaged or compacted soil shall be implemented.

14.1.1.1
Soil Turning - Areas which have been compacted shall be ripped, disked or plowed to a minimum depth of twelve inches to improve soil porosity before planting.

14.1.1.2
Radial Trenching - (preferred) with an air excavator, excavate a soil trench 3 to 6-inches wide and a minimum of 12-inches deep commencing (approximately) 3-feet from the trunk out to the drip line area. The trenches shall radiate out from one foot apart at the closest point. Backfill the trench with a 50/50 mixture of native soil and composted material.

14.1.1.3
Vertical Mulching - auger holes 2 to 4-inch diameter, 2 to 3-feet deep, on 4-foot centers and backfilled with a 50/50 mixture of native soil and composted material.

14.1.1.4
Soil-fracturing – Using a probe attached to a pneumatic device.

14.1.1.5
Subsurface - Injections of water under moderate hydraulic pressure using a three foot probe and applied on 3-foot centers under the drip line.

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15.0 TREE PROTECTION

Destruction or damage of trees prohibited. Chapter (city code) makes it unlawful for any person on public property owned by the City of El Paso to intentionally damage, cut, carve, abuse, poison or otherwise harm or injure any tree except in the performance of properly authorized and directed duties of an City employee or a private contractor pursuant to the specific terms of contract with the City conducted in conformity with this Manual. City Departments are responsible for making their employees or any contractors under their supervision are aware that trees and shrubs are considered valuable public property comprising part of the existing city infrastructure and as such, are afforded full protection by City ordinance.

15.1 Tree Protection and Preservation Plan (TP&PP)

Prior to commencement of a development project constructed on public property, City Departments shall engage a Project Arborist to prepare a Tree Protection and Preservation Plan if any activity is anticipated within the drip line of a tree.

15.1.1
Plan - The TP&PP shall assess all impacts to existing trees and shrubs; develop and recommend appropriate construction guidelines to protect site trees or mitigation to reduce adverse impacts upon them.

15.1.2
The City Arborist shall review and approve the TP&PP prior to issuance of any building permits.

15.2 Pre-Construction Requirements for Construction on Public Property

15.2.1
Site Design Plans - All improvement plans for the project shall contain an accurate depiction of all trees and shrubs or groups of trees and shrubs to be preserved or removed within the development area and shall be clearly plotted. In addition the plans shall accurately show the trunk diameter and drip line area, and shall clearly indicate the tree protection zone (TPZ) to be enclosed with the specified tree fencing as a bold dashed line.

15.2.2
Pre-construction meeting - A review of required tree protection measures, including approved haul routes, staging and storage sites, tree irrigation schedules, etc. shall be conducted with the demolition, grading and underground contractors, construction superintendent and other pertinent personnel at the site prior to beginning any work.

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15.2.3
Verification - The Project Arborist shall verify that all preconstruction tree protection conditions have been met and that tree fencing is in place, before construction begins.

15.3 Tree Protection Zone (TPZ)
Each tree to be retained shall have a designated TPZ identifying an area sufficiently large enough to protect the tree and roots from disturbance. The minimum acceptable TPZ area shall encompass the drip line of the tree or the outer most drip line of a group of trees. The TPZ shall be shown on all site plans for the project improvements. Construction activities such as paving, utility and irrigation trenching and other ancillary activities shall occur outside the TPZ, unless authorized by the City Arborist. Unless otherwise specified in the approved TP&PP, the protective fencing shall serve as the boundary of the TPZ.

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15.4 Prohibited activities within the TPZ.

15.4.1
Storage or parking vehicles, building materials, trash, excavated spoils or dumping of poisonous materials on or around trees and roots. Poisonous materials include, but are not limited to, paint, petroleum products, concrete or stucco mix, dirty water or any other material, which may be deleterious to tree health.

15.4.2
Using tree trunks as a winch support, for anchorage, as a temporary power pole, signposts or other similar function.

15.4.3
Cutting of tree roots by utility trenching, foundation digging, placement of curbs and trenches and other miscellaneous excavation without prior approval of the Project Arborist.

15.4.4
Altering drainage patterns toward or away from the tree or grade change.

15.5 Protective Tree Fencing

15.5.1
Size and type of fence - All trees to be preserved shall be protected by installation of a temporary chain link fence at least five (5') foot high. Temporary plastic mesh fencing may be substituted for the required chain link fencing requirements in emergency work situations or for short term projects upon approval of the City Arborist.

15.5.2
Installation - Required tree fencing shall be erected before demolition, grading or construction begins and shall enclose the entire TPZ of the tree(s) to be protected throughout the conduct of the project or until final site improvement work within the area

is approved after final inspection. Fences are to be mounted on two-inch diameter galvanized iron posts, driven into the ground to a depth of at least 2-feet at no more than 10-foot spacing. If the fencing must be located on paving or sidewalk that will not be demolished, the posts must be supported with a secure above grade footing or support.

15.5.3
Exceptions as Approved by the City Arborist

15.5.3.1
For trees situated within a narrow planting strip adjacent to walkways or streets, only the planting strip should be enclosed with the required chain link protective fencing.

15.5.3.2
In those cases where, in whole or in part, installation of the specified protective fencing is impractical or must be subsequently removed for approved project work, the exposed portion of the TPZ shall be provided with a root protection barrier of mulch no less than 4 inches in depth. Mulch material shall be 2-inch unpainted, untreated wood chip or bark mulch or approved equal.

15.5.3.3
Trees situated in exposed small tree wells or sidewalk planter pits shall be wrapped with 2-inches of approved padding material from the ground to the first major branch. In addition, 2-inch thick wooden slats bound securely on the outside of the padding by safety orange plastic material shall be installed. During installation of the wood slats, caution shall be used to avoid damaging any bark or branches. Major scaffold limbs may also require padding as directed by the City Arborist.

15.5.4
Protective tree fencing shall remain in place until final inspection of the project permit, except when earlier removal for completion of required work is specifically approved in the Tree Protection and Preservation Plan or subsequent approval is obtained from the City Arborist

15.6 Tree & Stump Removal
Removal of trees shall be by trained or certified tree workers in a manner that causes no damage above or below ground to nearby or adjacent trees. Before performing stump extraction, a determination shall be made as to whether or not roots may be entangled or grafted with trees that are to remain. If so, these stumps shall have their roots severed before extracting the stump.

15.7 Soil Disturbance or other Injurious and Detrimental Activity within a Tree Protection Zone (TPZ).

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15.7.1
Soil Compaction - If compaction of the soil occurs, it shall be mitigated as outlined in the Soil Improvement and Remediation (Section 14.1).

15.7.2
Grading Limitations within the Tree Protection Zone

15.7.2.1
Grade fills over 6-inches or impervious overlay shall incorporate an approved permanent aeration system, permeable material or other mitigation as approved by the City Arborist.

15.7.2.2
Grade cuts exceeding 4-inches shall incorporate retaining walls or an appropriate transition equivalent.

15.7.3
Trenching, Excavation and Equipment usage within the TPZ.

When permitted by the TP&PP or the City Arborist the following restrictions apply:

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15.7.3.1
Notification - Contractor shall notify the Project Arborist a minimum of 24 hours in advance of the activity in the TPZ.

15.7.3.2
Root Severance - Roots that are encountered or injured shall be cut cleanly. Roots 2- inches in diameter and greater should remain injury free.

15.7.3.3
Approved excavation, demolition or extraction of material shall be performed with equipment sitting outside the TPZ. Methods permitted are hand digging and hydraulic or pneumatic air excavation technology. Excavation exposing roots, within the TPZ during extremely hot, dry weather, when temperatures are expected to be 95 degree F or higher is not permitted.

15.7.3.4
Excavation or trenching for drainage, utilities, or irrigation lines shall not sever any roots over 2-inches in diameter but may tunnel around the root. Trenches should be either cut by hand, air, water or vacuum excavation or, by mechanically boring under the roots. In all cases, installation(s) shall be completed immediately, backfill with soil and water the same day.

15.7.3.5
Heavy Equipment - Use of backhoes, steel tread tractors or any heavy vehicles within the TPZ is prohibited unless approved by the City Arborist. If allowed, a

protective root buffer is required. The protective buffer shall consist of a base course of tree chips spread over the root area to a minimum depth of 12-inches with place steel plates placed on top of the mulch where vehicles must drive. This buffer within the TPZ shall be maintained throughout the entire construction process.

15.8
Public Utilities - Public utility improvements or repairs shall be performed in accordance with this policy and standards manual except in emergency situations requiring restoration of services affecting public health and safety.

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16.0 STANDARDS AND SPECIFICATIONS FOR HAZARDOUS TREES

To remove a tree, it must first be evaluated for risk and the tree determined to be "hazardous" as defined in this section. This is to avoid the unwarranted removal of sound trees on the grounds that they are hazardous. This must be verified in writing by the Project Arborist and approved by the City Arborist before the tree can be removed.

16.1 Tree Hazard Responsibility

On private property, it is the responsibility of the property owner to mitigate or abate a known hazardous condition of a tree that may be of questionable structure or deemed as hazardous. On public property, it is the responsibility of the managing City department to report to the City Arborist the possibility of risk to public safety or property. The City Arborist will then evaluate the tree and determine the risk.

16.2 Recognizing Tree Hazards

Determining whether or not a tree's defect constitutes a condition that presents an imminent hazard to an area requires a high degree of knowledge and experience. Hazard assessment of a tree should only be evaluated by a qualified arborist who is familiar with tree physiology and can interpret the external signs of weaknesses, and who can perform internal checks if necessary and follow-up with recommended mitigation.

16.3 Emergency Removal Conditions

When a tree or portion of a tree has failed or it is apparent it is about to fail and persons or properties are immediately threatened the tree or portion of the tree may be removed without City review or approval. The City does not require an arborist report before the removal in this instance.

16.4 Criteria Used By the City to Determine If a Tree Is Hazardous

16.4.1

Tree Evaluation Checklist - This section is intended to further help any City department managing trees to understand and identify tree defects. If you answer 'yes' to one or more of the checklist items, you should contact the City Arborist to discuss how to reduce the potential risk. (See Appendix A)

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17.0 REMOVAL OF AND MITIGATION FOR REMOVING TREES

A tree located on public property may not be removed without City review and approval, except in certain emergencies. The purpose of City review is to verify that the removal is allowed under chapter (city code) and to prevent unnecessary tree removal. In some cases, a removed tree must be replaced by the City. This section describes the type and size of tree required, to determine the replacement value of a tree that cannot be replaced in its original location, and the circumstances in which the City may require a security deposit to assure the survival of trees during development projects.

17.1 Tree Removal Is Allowed If:

17.1.1
A tree located on public property is determined to be dead, hazardous, a detriment to an adjacent tree, or a Public Nuisance.

17.1.2
A tree trunk is touching or the basal flare is under the building footprint of an existing building (for example, uplifting foundation, contact or damage to eves, gutter, etc.).

17.1.3
In the case of street trees, the Streets Department Director approves the removal in writing after consulting with the Project Arborist.

17.1.4
In the case of park trees, the Parks and Recreation Department Director approves the removal in writing after consulting with the Project Arborist.

17.1.5
In all other cases the Department head gets approval in writing from the City Arborist.

17.2 Tree Removal Report

The Project Arborist will provide a written narrative describing the tree species (common and scientific name); location (in relation to street, structures and property line); size (DBH, height & crown spread); condition (foliage, vigor, structural integrity, etc.); life expectancy and prognosis (is the tree hazardous, in severe decline, property damage, etc.?) for each tree to be removed.

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17.3 When Tree Replacement Is Required

17.3.1
Trees Located on Public Property - If the City authorizes removal of a tree because it is dead, dangerous, or a nuisance, no tree replacement is required but recommended. In all other cases, the tree must be replaced.

17.3.2
Protected Trees - When authorizing removal of a protected tree on the TP&PP, the City shall require tree replacement. The number and nature of the replacement trees shall be determined by the Project Arborist and approved by the City Arborist, taking into consideration the value of the tree removed and the site design.

17.4 Tree Canopy Replacement Standard for Onsite Tree Replacement

17.4.1
Species - The replacement trees shall be the same species unless the City Arborist determines that another species would be more suitable for the location.

17.4.2
Location - The location of the replacement tree on site shall be approved by the Project Arborist.

17.4.3
Size and number – (See Appendix B, Table 1)

17.4.3.1
Column 1 - Determine the leaf canopy of the removed tree by measuring the distance across the canopy at the widest point. The leaf canopy diameter of the tree shall be supplied within the Project Arborist report and will be used to determine number and size of replacement trees in Column 2.

17.4.3.2
Column 2 - Determine the number of replacement trees. The planting of new trees should equal the leaf canopy of the removed tree within a period of ten years. The minimum replacement for removal of any tree shall be two 24-inch box trees.

17.4.3.3
Column 3 - Alternative size of trees may be desired. The City shall have the option to plant an alternative size tree to accommodate site specific landscape needs or constraints, such as space, design or soil volume limitations.

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17.5 Tree Value Replacement Standard

If a tree or trees cannot be replaced using the tree canopy replacement method, then the value shall be determined by using the most recent edition of the Guide for Plant Appraisal published by the Council of Tree and Landscape Appraisers, in conjunction with the Texas supplement obtainable through the International Society of Arboriculture Texas Chapter. The replacement value will be determined using one of several methods as outlined in the book. The Project Arborist and the City Arborist must agree on the appropriate method. The payment on the value determined will be deposited into a Special Tree Care Account.

17.6 Alternatives When Trees Cannot Be Replaced On Site

In some circumstances, crowding or other physical constraints make it impossible or undesirable to replace a tree on site. In that case, the value of the tree shall be computed under the Tree Value Replacement Standard. Funds deposited into the Special Tree Care Account will be used in the following order of preference, as approved by the City Arborist: (1) to provide additional trees in the vicinity ; (2) to add or replace street trees or other public landscaping in the vicinity, or (3) to add trees or other landscaping to other public property.

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DEFINITIONS

ANSI: American National Standards Institute

BMP: Best Management Practices.

Cleaning is the selective removal of dead, diseased, and/or broken branches. Cleaning is done at any time to reduce risk and remove the possibility of the movement of decay, insects or disease from dead or dying branches into the rest of the tree.

ISA: International Society of Arboriculture

Hazardous
El Paso Municipal Code defines 'Hazardous' as: an imminent hazard or threat to the safety of persons or property. If a tree possesses a structural defect that may cause the tree or part of the tree to fall on someone or something of value (i.e. 'target'), and the condition is determined to be imminent, the tree is considered hazardous.

Raising is the selective removal of branches to a predetermined height to provide vertical clearance for pedestrian or vehicular traffic.

Reduction is the selective pruning to decrease height and/or spread of the crown. Consideration shall be given to the ability of a species to tolerate this type of pruning. This type of pruning is done to minimize the risk for limb failure, for utility line clearance, or to remove vegetation away from buildings or other structures.

Thinning is the selective removal of live branches to reduce crown density. Thinning is focused at the outside edge of the crown because the majority of small branches are, in that area. Proper thinning retains crown shape and should result in an even distribution of branches and foliage throughout the crown.

TP&PP: Tree protection and preservation plan

TPZ: Tree Protection Zone

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APPENDIX A

Risk Evaluation Questionnaire

Target
If the tree or branch falls, will it hit cars, houses, structures, power lines or people? If so, immediate action may be necessary.

Dead Branches
Are there dead tops or branches larger than 2 inches in caliper? Is the tree dead?

Cracks
Are there deep, open cracks in the trunk or branches?

Holes
Are there hollows or woodpecker holes in the tree?

Wood Rot
Do you see fungi (mushrooms) growing out of the trunk, branches or near the base of the tree?

Tree History
Has the tree recently dropped a large limb?

Do you have knowledge of root severance, underground utility installation or grade change within the drip line of the tree?

These are major starting points for tree failure. If you have answered yes to 1 or more of these questions please consult with the City Arborist.

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APPENDIX B

Tree Canopy Replacement Method

Example: The removal of a tree with a 39' crown spread will require four 24- inch box trees to satisfy the criteria of Section 17. Methodology e.g. the average canopy of a new tree is 4' wide + the expected canopy growth of 6" per year x 10 years = a 9' net canopy of one replacement tree. Thus, four 9' trees = 36' of new canopy, and is a close approximate to the original 39' canopy tree.

TABLE 1
** Replace the tree with a combination of both Tree Canopy and Tree Value Standards.
Note: Basis of this table is determined by the growth of one 24" box size tree, growing at a rate equivalent to 9 feet of canopy over the course of ten years.

Leaf Canopy Area (widest distance across the canopy)	Number of Replacement trees	Alternative size
4' – 9'	Two 24" box (minimum)	One 36" box
10' – 27'	Three 24" box	Two 36"
28' – 40'	Four 24" box	Two 48" box
40' – 56'	Six 24" box	Two 48" box & Two 36" box
56' – 60'	Two 24" box & Two 36" box + Two 48" box	**
60' +	**	**
Column 1	**Column 2**	**Column 3**

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