MINUTES OF A REGULAR MEETING OF THE PLANNING AND ZONING COMMISSION OF THE CITY OF PEARLAND, TEXAS, HELD ON TUESDAY, MARCH 2, 1993, 7 P.M. IN THE COUNCIL CHAMBERS, CITY HALL, 3519 LIBERTY DRIVE, PEARLAND, TEXAS

Chairman	Richard Tetens
Vice Chairman	Emil Beltz
Commissioner	Helen Beckman
Commissioner	Mary Starr
Commissioner	Pat Lopez
Commissioner	Jack Womack
Division Director - Planning, Public Works & Parks	Richard Burdine
City Engineer	John Hargrove
Chief Building Official	Don Guynes
Assistant to City Secretary	Sharon Parks

Commission Member James Garner was absent.

APPROVAL OF MINUTES

Commissioner Helen Beckman made the motion, with a second from Commissioner Mary Starr, to approve the minutes of February 9, 1993.

Motion passed 6 to 0.

NEW BUSINESS

FINAL PLAT OF MEDEARIS TRIANGLE - Request of Al Lentz, agent for James & Dorothy Medearis, owners

After a brief discussion with Al Lentz regarding the missing items on the plat, Commissioner Jack Womack made the motion, with a second by Commissioner Pat Lopez, to approve the final plat of Medearis Triangle with the stipulation that it include signature of the lender, year of adjustment for the benchmark, signature of City Engineer, getting the lienholder to sign off and that certified tax receipts be given to the Staff.

Motion passed 6 to 0.

VACATE FINAL PLAT OF FOOD LION

Division Director Richard Burdine stated that this plat was filed in error. It was represented to the City as having already been purchased, but it was not. The actual document for the Commission to sign won't be ready until next meeting.

Commissioner Mary Starr made the motion, with a second by Commissioner Helen Beckman, to vacate the final plat of Food Lion.

Motion passed 6 to 0.

FINAL PLAT OF ALEXANDER PARC

Chief Engineer John Hargrove stated that he would like the following corrections: (1) year of adjustment added to the elevation benchmark; (2) add the words "to Alexander Lane" to the end of their driveway access restriction notes; (3) eliminate the blank reference to volume and page under Remington Apartments, and (4) add owner's name.

Commissioner Beckman made the motion, seconded by Commissioner Starr, to approve the final plat of Alexander Parc with the stipulation that the corrections requested by the City Engineer be added.

Motion passed 6 to 0.

FINAL PLAT OF ROBIN COVE, SECTION II

Vice Chairman Emil Beltz made the motion, with a second from Commissioner James Garner, to approve the final plat of Robin Cove, Section II, with the stipulation that a 6 inch water line be installed rather than a 3 inch and that no fire hydrant be included.

Motion passed 6 to 0.

PRELIMINARY PLAT OF DIXIE WOODS

City Engineer John Hargrove stated that he would like to check the street names to see if there were any duplications or similarities in other subdivisions. He also stated that Richard Drive should be built through and the streets should co-align.

A lengthy discussion followed regarding detention ponds and their maintenance, road alignments, ingress and egress onto heavily trafficked Dixie Farm Road, radius on the corners (which will be added), recreational areas, fencing for sound barrier, and the possibility of signalizing McGinnis before second and third phases of the subdivision are begun.

Also there was input from Staff on its recommendation for a 2 foot fence easement with no access to Dixie Farm Rd. versus the 10 foot planting easement.

Commissioner Garner made the motion, with a second from Commissioner Starr, to approve the preliminary plat of Dixie Woods, Section I, to-wit:

> 32.8171 acres out of lots 64, 65, 66, 67, & 68 of the George W. Jenkins Subdivision, Volume 79, Page 616, Brazoria County Deed Records, in the W.D.C. Hall League, Abstract No. 70, Brazoria County, Texas, 150 Lots, 8 Blocks, 1 Reserve

along with the variances recommended by Staff as well as adding the radius drawings.

Motion passed 5 to 1 (Commissioner Womack opposed).

PRELIMINARY PLAT OF OAKBROOK, SECTION 3

Al Lentz, agent for Oakbrook, Section 3, asked that this plat be tabled at this time to allow time for the title to be cleared due to a foreclosure on a portion of this section.

PRELIMINARY PLAT OF CLEAR CREEK PROFESSIONAL PARK

Chief Building Official Don Guynes asked Al Lentz, agent, to show owner's name, address, phone number, company or corporation, name of adjacent subdivision, and utility easement on the plat.

A brief discussion followed regarding financial responsibility for the maintenance of detention ponds and the possibility of having the developer put money in escrow for at least ten years to cover the maintenance of the detention ponds.

Commissioner Starr made the motion, with a second from Commissioner Beckman, to approve the preliminary plat of Clear Creek Professional Park, to-wit:

> 8.1842 acres out of 64 & 65 of the George W. Jenkins Subdivision,1 Volume 79, Page 616, Brazoria County Deed Records, in the W.D.C. Hall League, Abstract No. 70, Brazoria County, Texas, 0 Lots, 1 Block, & 3 Reserves

and include the recommendations made by Staff as stated by Mr. Guynes.

Motion passed 5 to 1 (Commissioner Womack opposed).

DISCUSSION OF PROPOSED TRAFFIC IMPROVEMENTS ON WALNUT STREET AT ITS INTERSECTIONS WITH EAST BROADWAY, S.H. 35 AND WEST BROADWAY

City Engineer John Hargrove presented the two options on the west end which were discussed in a previous meeting. The options include the maintenance of the short segment of one- way Walnut, eastbound, and preferably getting coordinated signals at the intersection of Walnut & McLean with signals at the intersection of McLean & FM 518 with the idea of giving McLean precedence to the intersections to FM 518 and the addition of a left turn lane on FM 518. On the east end, a cul-de-sac and extension of Byron Avenue south to Walnut was presented as a solution to a terrible intersection problem.

DISCUSSION FOR CONSIDERATION OF A PUBLIC HEARING TO RECEIVE CITIZEN COMMENTS ON PROPOSED TRAFFIC IMPROVEMENTS ON WALNUT STREET AT ITS INTERSECTIONS WITH EAST BROADWAY, S.H. 35 AND WEST BROADWAY

Mr. Hargrove suggested a public hearing with maps since this proposal is a major change to City streets. He also stated that the public needs to have time to think about the changes.

The Commission determined the best way to solicit the citizens' comments would be to publicize the changes in the paper and then schedule several public hearings. There needs to be a presentation hearing and a comment hearing with written copies of the comments. There needs to be a time frame of at least 30 days between the presentation and the hearings and 60 days between the initial publication and the presentation.

Additional suggestions were perhaps the State's plans for FM 518 could be publicized in the paper and then 2 weeks later publicize the information regarding the City's changes on Walnut. In that article, give a schedule of the presentation hearing and then follow that with a public hearing. Other suggestions were stand alone hearings, rather than joint hearings, with City Council and to schedule a workshop with City Council before the presentation to the public.

Division Director Burdine suggested making a presentation to City Council.

REQUEST OF RICHARD TETENS, CHAIRMAN, FOR CHANGES TO THE RULES OF PROCEDURES

After a brief discussion of the proposed changes to the Rules and Procedures, the Commission decided not to take any action on the changes until the Commission members had a chance to review the Rules of Procedures for any additional changes.

DIRECTOR'S REPORT

Division Director Richard Burdine stated that due to the late hour, the workshop would be postponed until a later date. He briefly discussed the thoroughfare plan and the itinerary for the March 5 & 6 trip to various cities to view their landscaping and parks.

ADJOURNMENT

The meeting adjourned at 9:45 P.M.

Minutes of the meeting approved and/or corrected this 23rd day of March, A.D., 1993.

Richard Tetens, Chairman

ATTEST:

Pat Jones, City Secretary

NOTICE

PLEASE BRING PACKETS FROM FEBRUARY 23, 1993 MEETING. THAT MEETING WAS CANCELLED BECAUSE THERE WASN'T A QUORUM.

City of Pearland

P. O. Box 2068 • Pearland, Texas 77588-2068
(713) 485-2411 • Fax (713) 485-8764

AGENDA ITEM

To: Planning and Zoning Commission

From: Richard Burdine, Division Director, Planning, Public Works and Parks

Subject: Workshop on Tree Preservation Ordinances

Date: February 19, 1993

Attached are sample ordinances from other cities; West University Place and Rockport. Please review these examples and consider whether such provisions should be included in the Zoning Ordinance or a "stand alone" ordinance.

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ORDINANCE NO. 773

ROCKPORT TREE ORDINANCE

AN ORDINANCE REGULATING THE PLANTING, MAINTENANCE AND REMOVAL OF TREES IN PUBLIC STREETS, PARKS,MUNICIPAL- OWNED PROPERTY; SUBMITTAL OF A TREE PLAN IN CONJUNCTION WITH CONSTRUCTION AND/OR DEVELOPMENT ON PRIVATE AND PUBLIC PROPERTY; PROVIDING FOR THE PROTECTION OF CERTAIN TREES WITHIN THE CITY LIMITS OF ROCKPORT; ESTABLISHING A TREE COMMITTEE AND ESTABLISHING ENFORCEMENT OF THE REGULATIONS THEREOF; PROVIDING FOR PRUNING AND REMOVAL OF TREES ON PRIVATE PROPERTY WHICH ENDANGER PUBLIC SAFETY; PROVIDING FOR PENALTIES; PROVIDING A SEVERABILITY CLAUSE; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, trees are hereby declared to be of great value in the maintenance of the public health and welfare of the inhabitants of the City of Rockport, in the conservation of vital energy resources, and in the preservation of the City's historical heritage; and

WHEREAS, trees should be preserved to the maximum extent feasible for education and enjoyment of future generations, since large, old trees, if destroyed, can be replaced only after generations of time.

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

Section 1. The following provisions shall constitute and be known as the Rockport Tree Ordinance.

I. GENERAL PROVISIONS

A. All applicants for permits to work on public trees must comply with State and local liability insurance requirements, workmens' compensation and safety codes.

B. All work on public trees by the utility companies may be under the control of the City official in charge of the public trees, through inspections.

C. In new subdivisions ample area should be provided for public trees. The development of new subdivisions (as per Subdivision Ordinance No. 618, as amended) should be a joint project of the Tree Committee and subdivision owners.

II. DEFINITIONS

For the purpose of this Ordinance the following terms, phrases, words and their derivations shall have the meaning given herein. When not inconsistent with the context, words used in the present tonse include the future, words used in the plural include the singular, words used in the singular include the plural, words used in the masculine include the feminine, and words used in the feminine include the masculine. The word "shall" is mandatory and not merely directory.

A. City - meaning the City of Rockport, Texas.

B. Street or Highway - means the entire width of every public way or right-of-way when any part thereof is open to the use of the public, as a matter of right, for purposes of vehicular and pedestrian traffic.

C. Public Places - shall include all public parks and other grounds owned by the City.

D. Property Line - shall mean the outer edge of a street, highway or right-of-way and where private property begins.

E. Greenbelt - is that part of a street or highway, usually not covered by sidewalk or other paving, lying between the property line and that portion of the street or highway usually used for vehicular traffic. Greenbelt may also refer to that portion of streets or highways which incorporate medians, esplanades, malls or other designated areas reserved for landscaping or non-vehicular traffic.

F. Public Trees - shall include all shade and ornamental trees now or hereafter growing on any street or any public areas where otherwise indicated.

G. Property Owner - shall mean the person or persons owning such property as shown by the deed records which are kept on file in the County Clerk's office of Aransas County, Texas.

H. Tree - a woody plant having one well defined stem or trunk and more or less definitely formed crown, and usually attaining a mature height of at least eight feet (8').

I. D.B.H. - is the term "Diameter at Breast Height" which is the standard Forestry practice of measuring a tree's diameter, circumference, or caliper at an average height of four and one-half (4 1/2") above natural grade level.

J. Protected Tree - is any tree, whether on public or private property, having a trunk circumference of sixty inches (60") or more measured at D.B.H.

III. TREE COMMITTEE

A. There is hereby designated a Committee to be known as the "Tree Committee" composed of two (2) members of the City Staff and two (2) members from designated commissions. Such committee shall consist of the following:

1. Director of Public Works

2. Building Official/Zoning Administrator

3. One member from the Board of Parks and Recreation

4. One member from the Planning and Zoning Commission

B. The duties of said "Tree Committee" shall be as follows:

1. To study any problems and determine the needs of the City in connection with the enforcement of this ordinance.

2. To make recommendations for the type and kind of trees to be planted, maintained or removed upon streets and right-of-ways, in parks, and in public places as designated.

3. To review site plans during the normal course of plan checking & permit review for construction and make recommendations as for the best use of trees insofar as removal, planting or maintainance are concerned.

4. To designate a member, or members, of said Committee to carry out the enforcement of this Ordinance when necessary.

C. The above duties and responsibilities should be performed routinely by the "Tree Committee" members during normal working hours when time permits and when neccessary to ensure compliance with this Code.

IV. REMOVAL, REPLANTING AND REPLACEMENT

A. Removal of Protected Trees

1. No person or corporation shall remove or cause the removal of any protected tree without first securing approval from the Tree Committee, except as provided in subsections (a) and (b) below.

(a) When site plan approval is required by the Building Department and/or City Council for any development, the owner or authorized agent

section shall be shown on all site plans and such site plans shall be reviewed by the Tree Committee. Said committee shall then submit their recommendations to the Building Department and/or City Council. Final approval of the site plan shall constitute approval for tree removal as to any protected tree indicated on the site plan as being removed by the approved development.

(b) For all City of Rockport projects and/or developments, site plans shall be reviewed by the Tree Committee. Said Committee's recommendations shall be forwarded to the City Council. The City Council's approval of all public projects shall constitute approval for tree removal as to any protected tree indicated at that time as being removed by such project and/or development.

2. The Tree Committee shall approve removal of a protected tree located on privately-owned property when a showing is made that the tree is so located as to prevent reasonable access to the property or as to preclude reasonable and lawful use of the property. Where removal of the tree would become unnecessary if a variance were granted by the Board of Adjustment in the application of the Zoning Ordinance, no application fee for the variance shall be charged where such application is required by this subsection.

3. The Tree Committee shall approve the removal of a protected tree in connection with construction, maintenance, or repair of public facilities in or upon a public street, alley, right-of-way or other public land under one or more of the following conditions:

(a) The location of the tree prevents the opening of reasonable and necessary vehicular traffic lanes in a street or alley.

(b) The location of the tree prevents the construction of utility lines or drainage facilities which may not feasibly be rerouted.

B. Removal In Greenbelt Areas

1. Wherever it is necessary for the City to remove a tree or trees from a greenbelt in connection with the paving of a sidewalk, or the paving or widening of the portion of a street or public way used for vehicular traffic, the City shall replant such trees or replace them. Provided that conditions prevent planting on greenbelts, this requirement need be satisfied if any

equivalent number of trees are planted in an attractive manner on the adjoining property, or, where this is not practical, planted in some other designated public or private location.

2. No person or property owner shall remove a tree from the greenbelt for the purpose of construction, or for any other reason, without first obtaining approval from the designated City official(s). Any replacement shall meet the standards of size, species, and placement as recommended by the Tree Committee. Such person or property owner shall bear the cost of removal and replacement of all trees removed.

3. Organizations such as, but not limited to, homeowners associations, subdivision control committees, neighborhood improvement programs or groups, person or persons affiliated with such activity and are authorized to care for, maintain and landscape such greenbelts, medians or other designated property (both public and private), shall first seek and receive approval from the designated city official(s).

C. Removal at Development Sites

1. No person or persons shall remove or bring about the destruction of trees on any commercial property or development site, with the exception of single family residential property, until a plot plan has been filed and approved by the Tree Committee.

2. Such plot plans shall meet, where practicable, the requirements outlined in Section VI,C,2.

V. OBSTRUCTION - TREES PRUNED

A. It shall be the duty of any person or persons owning or occupying real property bordering on any street or public way upon which property there may be trees, to prune such trees in such manner that they will not obstruct or shade th e street lights, obstruct the passage of pedestrians, on sidewalks, obstruct vision of traffic signs, or obstruct view of any street or alley intersection. Such clearances and prunings shall be made to the satisfaction of the Tree Committee.

B. Should any person or persons owning real property bordering on any street fail to prune trees as herein above provided, the Tree Committee shall order such person or persons, within ten (10) days after receipt of written notice, or within ten (10) days after notice by publication as many as

two (2) times within ten (10) consecutive days in the newspaper in Rockport, Texas if personal service may not be had as aforesaid or if the owner's address be not known, to so prune such trees.

C. The order required herein shall be served by mailing a copy of the order to the last known address of the property owner, by certified mail.

D. When a person to whom an order is directed shall fail to comply within the specified time, then in that event the City of Rockport, Texas may do such pruning and/or trimming, or cause the same to be done and may pay therefore and charge the expenses incurred in doing such work or having such work done at the expense of the City of Rockport, Texas, then such expense or expenses shall be assessed on the real estate or lot or lots upon which such expense was incurred and a lien placed on the real property as provided by law.

VI. SPECIFIC REQUIREMENTS

A. Unless specifically authorized by the Tree Committee, no person shall intentionally damage, mutilate, allow any gaseous liquid or solid substance which are harmful to trees, to come in contact with them; or set fire or permit any fire to burn when such fire or the heat thereof will injure any portion of any tree.

B. Spacing of replaced or newly planted trees should be determined by the Tree Committee according to local conditions, tree species used, their height, spread and form. It is recommended that trees in greenbelt areas should be planted at least thirty feet (30') from street intersections and at least ten feet (10') from driveways and alleys. In congested areas, or areas where concrete and/or paving is to be placed, each tree should have at least nine (9) square feet of open basal space.

C. Site Plan for Construction or Development

1. The plot plan that is required for building permits shall include, where required, a tree plot plan with the following:

   (a) General location and general identification of all trees.

   (b) Location of proposed structure, parking areas, and other planned areas.

   (c) Indication of trees to be removed and trees to be retained.

(d) Grade changes and/or concrete placement which might adversely affect or endanger the trees.

2. Where improvements necessitate removal of trees within a development, the same or other species shall be relocated or replaced, tree for tree, wherever practical. The following tree replacement criteria should be specified:

(a) Minimum diameter of replacement trees should be no less than one and one-half inches (1 1/2") measured at D.B.H. above grade.

(b) When it is found impractical to relocate or replace within the development, replacement may be made upon public owned property, property of non-profit organizations, parks, or right-of-ways, subject to approval of the Tree Committee.

VII. VIOLATION AND PENALTY

Any person, firm, or corporation violating or failing to comply with any of the provisions of this ordinance shall be guilty of a misdemeanor, and upon conviction thereof shall be fined a sum of no less than One Dollar ($1.00), nor more than Two Hundred Dollars ($200.00).

VIII. VALIDITY

If any section, subsection, sentence, clause, or phrase of this Ordinance is for any reason held to be invalid, the same shall not affect the validity of the remaining portions of this ordinance.

Section 2. This Ordinance shall become effective on the first day of June, 1987 and shall be published one time in the official newspaper of the City of Rockport, Texas.

APPROVED ON FIRST READING This 12 day of May, 1987.

C. H. Mills, Jr., Mayor
City of Rockport, Texas

ATTEST:

Helen G. Braffett, City Secretary

City of Pearland

P. O. Box 2068 • Pearland, Texas 77588-2068
(713) 485-2411 • Fax (713) 485-8764

AGENDA ITEM

To: Planning and Zoning Commission

From: Richard Burdine, Division Director, Planning, Public Works and Parks

Subject: Vacation of Food Lion Subdivision

Date: February 19, 1993

The referenced subdivision was filed prematurely and now should be vacated. The attached vacation certificate is recommended for approval.

Action:

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VACATION CERTIFICATE

STATE OF TEXAS }

COUNTY OF BRAZORIA }

WHEREAS, 313 ACRES PEARLAND Joint Venture, is the owner of a 4.081 acre tract of land situated in the W.D.C. Hall Survey, Abstract No. 70, Brazoria County, Texas, being a portion of a 297.58 acre tract of land described in deed recorded Volume 1023, page 297, of the deed records of Brazoria County, Texas, said tract being all of the Food Lion-Pearland Addition, according to the plat thereof recorded in Volume 19, Pages 99-100 of the Plat Records of Brazoria County, Texas; and

WHEREAS, it is the desire of the owner of the property and FOOD LION, INC., to vacate this Plat; and,

NOW, THEREFORE, Know all men by these presents:

THAT FOOD LION, INC., does hereby vacate the said Plat so that it shall no longer have any force or effect or any purpose.

EXECUTED this the _____ day of _____, 1993.

FOOD LION, INC.

By:_____

Before me, the undersigned authority, on this day the _____ of _____, 1993, did personally appear _____, known to me to be the person whose name is subscribed to the foregoing instrument and acknowledged thereat. Given under my hand and seal of office as Notary Public this day the _____ at _____, 1993.

_____
Notary Signature

My Commission expires _____

CITY OF PEARLAND

_____ _____
Date Approved by Pearland City Attorney

_____ _____
Date Approved by Pearland City Engineer

_____ _____
Date Approved by Pearland Planning & Zoning Commissioner

_____ _____
Date Chairman

_____ _____
Date Vice Chairperson

_____ _____
Date

_____ _____
Date

_____ _____
Date

_____ _____
Date

_____ _____
Date

c\wp51\wp\064\foodln-v.cer

AGENDA - REGULAR MEETING OF THE PLANNING AND ZONING COMMISSION OF THE CITY OF PEARLAND, TEXAS, TO BE HELD TUESDAY, MARCH 2, 1993, AT 7:00 P.M., IN THE CITY COUNCIL CHAMBERS, CITY HALL, 3519 LIBERTY DRIVE, PEARLAND, TEXAS

I. **CALL TO ORDER**

II. **APPROVAL OF MINUTES:** Meeting of February 9, 1993

III. **NEW BUSINESS:**

1. CONSIDERATION AND POSSIBLE ACTION - FINAL PLAT OF MEDEARIS TRIANGLE

2. CONSIDERATION AND POSSIBLE ACTION - VACATION OF FOOD LION PLAT

3. CONSIDERATION AND POSSIBLE ACTION - FINAL PLAT OF ALEXANDER PARC

4. CONSIDERATION AND POSSIBLE ACTION - FINAL PLAT OF ROBIN COVE, SECTION II

5. CONSIDERATION AND POSSIBLE ACTION - PRELIMINARY PLAT OF DIXIE WOODS

6. CONSIDERATION AND POSSIBLE ACTION - PRELIMINARY PLAT OF OAKBROOK, SECTION 3

7. CONSIDERATION AND POSSIBLE ACTION - PRELIMINARY PLAT OF CLEAR CREEK PROFESSIONAL PARK

8. DISCUSSION OF PROPOSED TRAFFIC IMPROVEMENTS ON WALNUT STREET AT ITS INTERSECTIONS WITH EAST BROADWAY, S.H. 35 AND WEST BROADWAY

9. DISCUSSION FOR CONSIDERATION OF A PUBLIC HEARING TO RECEIVE CITIZEN COMMENTS ON #8 SAID IMPROVEMENTS

10. CONSIDERATION AND POSSIBLE ACTION - REQUEST OF RICHARD TETENS, CHAIRMAN, CHANGES TO THE RULES OF PROCEDURE

IV. **DIRECTOR'S REPORT**

V. **ADJOURNMENT**

POSTED_____DAY OF_____,A.D., 1993,_____P.M.

REMOVED:_____DAY OF_____, A.D., 1993_____.

AGENDA - REGULAR MEETING OF THE PLANNING AND ZONING COMMISSION OF THE CITY OF PEARLAND, TEXAS, TO BE HELD TUESDAY, MARCH 2, 1993, AT 7:00 P.M., IN THE CITY COUNCIL CHAMBERS, CITY HALL, 3519 LIBERTY DRIVE, PEARLAND, TEXAS

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IV. **DIRECTOR'S REPORT**

V. **ADJOURNMENT**

POSTED 26th **DAY OF** February **,A.D., 1993,** 4:10 **P.M.**

REMOVED: 5th **DAY OF** March **, A.D., 1993** .

CRITERIA MANUAL

CITY

of

WEST

UNIVERSITY

PLACE

June 19, 1992

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IMPORTANT NOTE

This manual is to be used and interpreted in accordance with the City's ordinances on urban forest preservation and enhancement, codified as Article XIV of Chapter 6 of the City's Code of Ordinances. Unless the context indicates that another meaning is intended, terms used in this manual have the same meanings as in Article XIV.

1. TREE SURVEY STANDARDS

1.1 REQUIRED FIELD DATA

Tree data submitted for a Tree Survey or Tree Disposition Plan must be obtained from a ground survey. The data that must be obtained in the field are Tree locations, circumferences, types (species), and crown areas (the dripline).

1.1.1 Location

Tree Surveys must be as accurate as possible, but need not be certified. Levels of inaccuracy that will result in a failure to comply with the City ordinance and construction specifications may necessitate new surveys and plan adjustments prior to permit approval.

Trees on City easements adjoining the site must be surveyed.

Trees with 30% or more of their Critical Root Zones extending onto an affected Subject Site or project easement must be surveyed. Trunk locations of off-site Trees may be estimated to avoid trespass problems.

Methods for locating Trees may vary depending on the size of the project and number of Trees. In most cases, taping the distance to the center of the trunk from two (2) known points is a viable option.

1.1.2 Circumference

The circumference of a Tree trunk is measured 4.5 feet above the ground using an ordinary tape measure or diameter tape. (A Tree on a slope shall be measured from the high side.) Measurement is taken just above or just below any unusual swells in the trunk, as closely as possible to the 4 and one-half foot level (see Figure 6-502(1)). For Multiple-Trunk Trees, the trunk Circumference is deemed to equal the Circumference of the largest trunk plus half the Circumference of each additional trunk. Measurements should be accurate to the nearest 1/2 inch.

1.1.3 Type (Species)

Tree types should be accurate to the species level and may be listed by common names or botanical names (e.g. Post Oak or Quercus stellata).

Good field references for Houston are: Texas Trees, a Friendly Guide, by Paul W. Cox and Patty Leslie (available from Chickadee Nature Store, 713-956-2670); the Trees For Texas Resource Guide, available from the Texas

Department of Agriculture, 512-463-7504; Field Guide to Texas Trees, by Benny J. Simpson; and Trees, Shrubs and Woody Vines of East Texas, by Elray Nixon.

1.1.4 Critical Root Zone; Crown.

The Critical Root Zone (or "CRZ") means, for any given Tree, the area within a circle centered on the trunk location. The circle's diameter is one-half the sum of the broadest and the narrowest dripline diameters. See Figure 1b, attached.

The dripline and crown information will also be useful in assessing the impact of projected construction.

1.2 RECOMMENDED ADDITIONAL FIELD DATA

1.2.1 Crown Clearance

This information is often critical in determining whether a given structure of vehicular use area can practically be placed within the dripline of a Tree. If this information is recorded, the surveyor should consider the vertical distance to any major branches.

1.2.2 Condition

This is one of the principal factors in determining whether a Tree should or should not be preserved. Surveyors should not speculate about the condition of Trees unless they have the necessary credentials; however, if a Tree is obviously in poor condition, it should be noted.

1.2.3 Spot Elevation

Taking an elevation reading near the trunks of some Trees will provide valuable information for project designers. Since grade changes have a very destructive impact on Trees, it is important to get the most accurate information possible.

1.3 PLAN GRAPHICS

The standard Tree graphics discussed below are important to provide consistent information in the most useful format for efficient plan review. See Figure 2 for examples of Tree graphics.

1.3.1 Trunk Location

The trunk location on the plan must represent the center of the trunk at ground level. If the Tree leans substantially above that point, show the direction of the lean with an arrow.

1.3.2 Critical Root Zone (CRZ); Crown; Retained Trees

The Critical Root Zone should be indicated by a circle centered on the trunk. If the crown is significantly skewed or irregular, show also a circle with a radius in feet equal to the diameter of the Tree in inches or per measurement of crown area whichever is greater. The actual crown may also be shown if it is skewed and will have a significant impact on construction. Note that the actual amount of critical roots for any tree will depend upon many factors (see Section 2.2.1 Root Zone Impacts).

Trees proposed to be retained are to be represented by circles drawn with a solid line, while Trees proposed to be removed are to be represented by dashed lines. Proposed replacement Trees should be graphically differentiated, as shown in Figure 2.

1.3.3 Sizes and Types

Tree circumferences and types must also be shown on the plan. This information should be shown adjacent to each trunk location. For sites with a large number of Trees, this data should be shown in legend form referenced by a Tree number adjacent to each trunk location. Legends can be useful because they allow for the presentation of other data such as crown configuration, height, condition, etc.

1.4 SMALL-SCALE PROJECTS

The Urban Forester may prescribe the contents for a simple, low-cost Tree Survey for small-scale projects. For these projects, the Urban Forester may allow the deletion of some data and details otherwise required and may make provisions to assist lay persons preparing their own surveys.

2. TREE EVALUATION AND SITE PLANNING

The Urban Forester shall use the following criteria to evaluate Trees shown in Tree Surveys and, working with the applicant and City building officials, the Urban Forester shall approve Tree Disposition Plans if they comply with: this Chapter 2, the provisions of Chapter 3 (relating to mitigation, if applicable) and the other applicable provisions of this manual.

The Urban Forester may prescribe the contents for a simple, low-cost Tree Disposition Plan for small-scale projects. For such projects, the Urban Forester may allow the deletion of some data and details otherwise required and may make provisions to assist lay persons preparing their own plans.

While the guidelines set forth here are intended to be as comprehensive as possible, no printed document can substitute for the knowledge and experience of a qualified urban forester. The recommendations of the City Urban Forester may differ from a simple "face value" interpretation of these guidelines; however, the Forester should work cooperatively with the applicant and with City building officials to reach a mutually agreeable solution. The Forester should also be prepared to justify "non-standard" decisions by presenting the special circumstances that apply.

The process of Tree evaluation and site planning will include:

- The identification of valuable Trees;
- An assessment of minimum standards for Tree preservation;
- An analysis of design constraints and alternatives; and
- The negotiation of mitigative measures when necessary.

2.1 TREE EVALUATION

The City's ordinances addresse the preservation of Large Trees. However, not all Large Trees have the same value, due to such factors as type (species) or condition. Conversely, some smaller trees may have greater value due to their rarity, screening potential or other factors.

2.1.1 Tree Evaluation Method

The following factors must all be considered in determining the value of any tree. Weighing factors are included to aid in this determination.

Using these criteria, a designer can walk the project area and perform a rough analysis of the tree situation before starting the design of the project. The Urban Forester should use these same factors in approving the Tree Disposition Plan.

Ten factors are included: condition, type, size, aesthetics, energy conservation and heat abatement, safety, adjacent Trees, water quality protection and soil conservation, wildlife habitat and historic significance.

The sum of scores for all ten factors determines the relative value of a Tree. In general, highly valued Trees (total rating of 30 or more out of a possible 40) should be preserved if at all possible. In all cases, the initial calculation of replacement inches required will depend on the valuation and size of the Tree being removed.

2.1.2 Condition

In assessing a Tree's condition, the forester considers trunk condition, growth rate, tree structure, insect and disease problems, crown development and life expectancy. A score is assigned as follows:

1 = Poor
2 = Fair
3 = Good
4 = Excellent

2.1.3 Type

The species of Trees found in the City have been divided into four classes based on overall quality. The chart in Appendix A indicates how each species fits in this general classification. A score is assigned as follows:

1 = Class IV
2 = Class III
3 = Class II
4 = Class I

2.1.4 Size

Tree sizes are divided into four categories. A score is assigned for each size category as follows:

1 = Less than 25 inches circumference (8 inches diameter)
2 = Between 25 inches cf. and 50 inches cf. (16 inches diameter)
3 = Between 50 inches cf. and 75 inches cf. (25 inches diameter)
4 = More than 75 inches cf.

2.1.5 Screening; Aesthetics

Trees may score high in this area if they provide screening and privacy to the property or if they are in good condition and have exemplary form. A score is assigned as follows:

1 = Poor
2 = Fair
3 = Good
4 = Excellent

2.1.6 Energy Conservation and Heat Abatement

If a Tree is shading a building or pedestrian use area in its existing situation, it receives a high score under this category. The energy conservation and heat abatement potential is also considered even if there are not obvious benefits, since trees in general cool the air. For example, large Trees west of a buildable area will score high. A score is assigned as follows:

1 = Poor
2 = Fair
3 = Good
4 = Excellent

2.1.7 Safety

If a Tree is in a hazardous situation due to external factors related to man-made features (*not inherent in the condition of the Tree*), for example, its location relative to a road intersection, etc., it receives a low score. Scores reflect the feasibility of mitigating the safety problems and are assigned as follows:

1 = Hazardous; low mitigation potential
2 = Hazardous; medium mitigation potential
3 = Hazardous; high mitigation potential
4 = Not hazardous

2.1.8 Adjacent Trees

The proximity of other Trees has a bearing on a Tree's value. Everything else being equal, a lone Tree has greater value than one Tree of many. The fate of other Trees in the vicinity also affects this rating factor. A score is assigned as follows:

1 = Many Trees; high retention potential of adjacent Trees
2 = Many Trees; low retention potential of adjacent Trees
3 = Few adjacent Trees
4 = Lone Tree

2.1.9 Water Quality Protection and Soil Conservation

Trees help reduce storm water runoff and enhance ground water recharge by breaking the impact of raindrops and improving soil structure. A Tree's effectiveness in this capacity is correlated with the size of the crown and root area. Large Trees with full crowns and unrestricted root areas score highest in this category. A score is assigned as follows:

1 = Poor
2 = Fair
3 = Good
4 = Excellent

2.1.10 Wildlife Habitat

This factor is rated on the basis of the intrinsic value of the type of Tree as a provider of food and forage and general wildlife cover characteristics, or on the basis of field observations of a particular Tree.

Regarding field observations, an individual Tree may rate higher than the assigned intrinsic value of the genus due to such things as the presence of food-bearing parasites or epiphytes (e.g., mistletoe or grapes) or due to the potential for or actual presence of wildlife nesting cavities. A score is assigned as follows:

1 = Poor
2 = Fair
3 = Good
4 = Excellent

2.1.11 Historical significance

The highest rating in this category is reserved for Trees that fit one of the following criteria:

- The Tree is on a registry of historic or especially important Trees.
- The Tree has been documented as historically significant.
- The Tree is rare in the Houston area.
- Due to its location and size, the Tree serves as a significant landmark on the landscape.

Since historical significance is largely a function of age, the Urban Forester's estimate of the age of the Tree also has a bearing on this value. A score is assigned as follows:

1 = Less than 20 years old.
2 = Between 20 and 40 years old.
3 = Greater than 40 years old.
4 = Registered, rare or landmark tree.

2.2 TREE PRESERVATION CRITERIA

2.2.1 Root Zone Impacts

Although a Tree's root system ranges well beyond the dripline, for the practical purposes of this Criteria Manual and the ordinances, the Critical Root Zone (CRZ) has been established.

Because existing development on a site may affect the actual distribution of tree roots, the Urban Forester may require protection of areas outside the CRZ and may determine that it is not necessary to protect areas within the CRZ where there may be few, if any, significant roots. For example, a Tree growing next to a house on a slab will not normally have as many significant roots beneath the slab as the side of the root system growing without the covering of a non-porous surface. This will allow new buildings to be erected on the site of the old slab near a Tree to be preserved.

Design constraints often dictate that Trees slated for preservation have

some encroachment on their CRZ. Weighing this fact with what appears to be an acceptable degree of risk to most Trees, the following maximum allowable impacts have been established for Trees with normal CRZ's:

- o A minimum of 75% of the CRZ must be preserved at natural grade, with natural ground cover.
- o No cut or fill greater than two (2) inches will be located within the inner 3/4 of the CRZ.

In order to ensure that root zones are adequately preserved, protective fencing should be erected to enclose areas with significant roots. Root areas that will be covered with permeable paving must be protected by fencing until the immediate time for construction of the permeable paving. If this is not possible (due to limited access to the site), mitigative measures must be taken to protect the roots as much as possible (see Section 3.1.2).

2.2.2 Crown Impacts

The following is the maximum allowable impact for Tree crowns:

- o A maximum of 30% of the viable portion of a Tree's crown may be removed.

Construction methods must also be considered. For example, a building wall may only require the removal of 30% of the crown, but the scaffolding necessary to construct the building may require the removal of another 20% of the crown.

2.2.3 Deviations from Criteria

These criteria represent minimum standards for determining whether or not a Tree is "preserved." Greater impacts may be allowed, provided that all design alternatives have been proven unfeasible and that some acceptable form of mitigation such as a remedial care program is negotiated (see Section 3.1.1). Conversely, some cases may require that a larger area of root area be preserved to increase the survival potential of particularly valuable Trees.

These design criteria are enforced in the field as well as on the plan. Plan adjustments made during construction must be reviewed and approved by the City Urban Forester prior to the adjustments being made.

2.3 DESIGN CONSTRAINTS AND ALTERNATIVES

In addition to the preservation of valuable Trees, many other factors can affect site planning: reasonable and lawful use of the property, cut and fill limitations, access and egress restrictions, parking and driveway requirements, and impervious cover limitations. Tree preservation is intrinsically less definitive than most of these restrictions, and all factors must be considered together to arrive at a reasonable solution. In some cases it may be desirable or necessary to remove Trees and replace them with newly planted Trees.

In order to best provide for the preservation of Trees, the project designer should carefully consider different design alternatives in the *initial* planning of the project. Meeting with the City Urban Forester in a preliminary consultation prior to submitting plans for review is advised when there appear to be conflicts.

In the review of a proposed project, the first indicator of how well Trees have been incorporated in the design process is the impact on Large Trees. These Trees are considered on an individual basis, and a proposal to remove any of them is carefully scrutinized.

Another indicator is how the proposal will impact smaller, valuable Trees. These Trees are typically considered in mass as they relate to the overall preservation of the character of the site.

The following sections describe some design alternatives that can be used to preserve Trees.

2.3.1 Permeable Paving

This alternative is less preferable than leaving 75% of the root area natural. The qualities that make a good paving surface are in direct conflict with the qualities necessary to save tree roots. Permeable paving is permitted, however, provided the installation meets City specifications and the following criteria:

- Finished grade of the permeable paving surface must be a minimum of six (6) inches and a maximum of 18 inches above existing grade to provide room for base and paving material without cutting.
- A minimum of 60% of the CRZ must remain at natural grade with a natural ground cover.
- The combined area of permeable paving and natural cover around a Tree must be at least 80% of the CRZ.
- Permeable paving is only permitted in parking spaces and low traffic drives.

2.3.2 Building Alternatives

In many cases Buildings have been erected very close to the Tree with little adverse effect on the Tree. Construction methods that make this possible include:

- o Pier and beam foundations, with sufficient air space to allow oxygen to penetrate into the soil for the roots.
- o Finished floor elevations that minimize cut and fill.
- o Buildings notched around significant trees.
- o Buildings designed to fit under crowns of adjacent Trees.

To comply with the design criteria requiring retention of 70% of a Tree's crown, consideration must be given to the following:

- o Providing adequate work space during construction;
- o Providing a safe distance between limbs and walls, eaves, roofs, etc,; and
- o Applying proper pruning techniques.

2.3.3 Sidewalks

Sidewalks appear innocuous on plans, but can be very detrimental to Trees because of grading requirements. Some design alternatives that should be considered are:

- o Move sidewalk as far from Tree trunks as possible.
- o Construct sidewalk on grade in the location of the original sidewalk.
- o Provide a finished grade above existing grade for sidewalks required in close proximity to a Tree trunk.
- o Route drainage under sidewalks where elevated grade is required.
- o Reduce width of sidewalk.

2.3.4 Grading

A grade change of a few inches can be extremely detrimental to a Tree.
Some design alternatives that can be used to preserve Trees are as follows:

- o Provide Tree well and/or aeration systems for Trees in fill areas. (See Figure 3.)
- o Provide retaining walls to mitigate cuts and fills. (See Figure 4.)

2.3.5 Utilities

Underground water and sewer lines, storm sewers, lawn irrigation systems have significant impact on Trees, as do overhead electric and telephone utilities. Some typical design alternatives that should be considered are as follows:

- o Establish the trenches for underground utilities where they will have the least impact on Trees.
- o Stack underground utility lines to reduce the number of trenches required.
- o Bore or tunnel under Trees to minimize root impacts (See Figure 5).
- o Hand-dig trenches to avoid cutting any roots larger than one (1) inch diameter.
- o When planting Trees, plant low-growing Trees under power lines.

3. MITIGATIVE MEASURES AND REPLACEMENT TREES

Many of the existing trees in the City grow very slowly, making preservation very critical to avoid long-term impacts. At the same time, land is at a premium, and there is considerable pressure to build on as &much land as possible. In many cases, it will be difficult to meet the above minimum standards, in which case, the Urban Forester may specify that Replacement Trees be planted or that special mitigative measures be taken to protect existing Trees.

3.1 MITIGATIVE MEASURES

To protect Large Trees in cases in which it is not possible to meet the minimum design criteria, the Urban Forester may stipulate mitigative measures. Some of these mitigative measures include:

3.1.1 Tree Maintenance

A remedial care program can increase the survival potential to an acceptable level in many cases. The City urban forester must review the remedial care program to estimate whether it will accomplish what is necessary to maintain the viability of affected Trees. Such a program might include schedules for watering, feeding, soil aeration, spraying, etc.

To ensure compliance, the program must be documented by a plan note at the time of plan approval. In addition, prior to issuance of a certificate of occupancy, a person may be required to submit, in especially critical cases, the following:

- o A signed service contract for review and approval by the City; and
- o Fiscal security in an amount equal to the going rate for the approved service plus 15% to cover administrative costs.

These measures are necessary because the remedial care program must typically extend over a minimum 18-month period after completion of the project.

3.1.2 Special Construction Techniques

In conjunction with remedial care, mitigation may include special construction techniques not normally required in standard specifications. Some of these techniques include the following:

- Leaving existing sidewalks and driveways in place for storage of materials and vehicular access, until construction of the Building is complete.
- Prior to excavation within Tree driplines or the removal of Trees adjacent to other trees that are to remain, make a clean cut between the disturbed and undisturbed root zones with a rock saw or similar equipment to minimize root damage.
- In significant root areas that cannot be protected during construction with fencing and where vehicular traffic is anticipated, cover those areas with four (4) inches of organic mulch or gravel topped by two-inch road boards to minimize soil compaction and root damage.
- Perform all grading within significant root areas by hand or with small equipment to minimize root damage.
- Water all Trees most heavily impacted by construction activities deeply once a week during periods of hot, dry weather. Spray Tree crowns with water periodically to reduce dust accumulation on the leaves.
- When installing concrete adjacent to significant roots of a Tree, use a plastic vapor barrier behind the concrete to prohibit leaching of lime into the soil.

3.2 REPLACEMENT TREES

The most common measure used to mitigate Tree removals in the planting of Replacement Trees. The following factors affect tree replacement:

- The quantity of Replacement Trees;
- The available planting area;
- The anticipated rate of survival of Trees planted;
- The types of Trees proposed.

3.2.1 Quantities of Replacement Trees

Replacement Tree values will be expressed in terms of caliper inches (diameter) measured per standards outlined in the American Standard of Nursery Stock, a publication prepared by the American Association of Nurserymen and approved by the American National Standards Institute. Measurements are to be taken as follows:

* 6 inches from the ground for Trees up to an including 4 inches diameter
* 12 inches from the ground for Trees 4 1/2 inches up to and including 8 inches diameter
* 4 1/2 feet above the ground for Trees 9 inches diameter and larger.

For Trees with a value greater than 30 points using the criteria in Section 2.1, replacement calculations will initially require 100% of the diameter of the Tree in question. For example, a Tree with a 75-inch circumference (24-inch diameter) will require 24 caliper inches of Replacement Trees, which could be met by six Trees of 4 inches each or four Trees of 6 inches each.

For Trees with a value from 20 to 30 points, replacement calculations will initially require 75% of the diameter of the Tree in question. In this case, a Tree with a 75-inch circumference (24-inch diameter) will require 18 caliper inches of Replacement Trees.

For Trees with a value from 10 to 19 points, replacement will initially require 50% of the diameter of the Tree in question.

In cases where a Tree is dead or judged by the Urban Forester to be in such poor condition that it will not live more than another year, no replacement is required.

In all cases, a reduction may be allowed in the number and sizes of Replacement Trees, if the applicant requests a reduction, and if the applicant demonstrates clearly that one or more of the following sets of circumstances is present: (i) there is not sufficient available space on the affected Subject Site for all the replacements initially calculated, taking into account the space ultimately needed for Trees upon maturity, (ii) there are sufficient remaining Trees on the affected Subject Site to maintain Tree cover and diversity on a level equivalent to, or better than, the average levels of coverage and diversity in the city as a whole, or (iii) the number of replacements calculated by formula is unreasonably large, and the overall urban forest would not be substantially and adversely affected if the reduction were allowed.

3.2.2 Available Planting Area

Replacement Trees should be planted on the Subject Site from which existing trees are to be removed. If this is not feasible, a person may initiate a proposal to plant Trees off-site. This may be acceptable if the planting site is in reasonable proximity to the project area.

3.2.3 Survival Potential

Before approving any replacement option, the City forester will assess the probability that Trees planted will survive. This typically requires that some type of irrigation capability be implemented for a minimum of two years. Irrigation may not be required if it can be

adequately demonstrated that, given the size and type of Trees planted, the planting site and the time of year the Trees are planted, the mortality rate is likely to be low.

3.2.4 Types of Replacement Trees

In order to enhance the general quality of the urban forest, 75% of the Replacement Trees required must normally be Class I or Class II species (see Appendix A). The Urban forester may recommend Trees from other Classes. All Trees must be suitable for the environment of the immediate planting site.

3.2.5 Enforcement Criteria

The location, size and type of all Replacement Trees must be shown on the Tree Disposition Plan in a manner which will allow verification of their installation at the time of inspection for Certificate of Occupancy.

Optimum planting times do not always correspond to project completion. For that reason, Replacement Tree plantings may take place after a certificate of occupancy is issued, provided that a person posts fiscal security in an amount equal to the going rate for installed Trees with a one-year guarantee, plus 15% to cover administrative costs. Certificates of occupancy may be issued conditionally in this case.

4. TREE PHYSIOLOGY

The following is a collection of facts regarding tree physiology which provide the basis for the subsequent design standards for preservation (see Figure 6).

4.4.1 Roots

Roots provide three primary functions: 1) support, 2) intake of nutrients and water and 3) storage of food reserves. Cutting a large root has the triple effect of reducing the tree's anchorage, destroying the nutrient intake potential beyond that point and reducing food reserves by a substantial amount.

Tree roots must respire in order to survive. Conditions which restrict the availability of oxygen effectively suffocate affected roots. Such conditions will also result in the accumulation of carbon dioxide and other toxic gases in the soil which adversely affect associated soil microfauna as well as the roots. Typical conditions which inhibit this essential gas exchange are compaction of the soil, addition of new soil (fill) and ponding of water.

Trees establish a balance between root and crown areas such that destroying a portion of one may lead to the destruction of a portion of the other.

Roots of adjacent trees are typically intermingled through the sharing of rootstock by several stems, grafting of roots by like species of trees or a general sharing of the same space. It is important to make a clean cut when severing roots rather than tearing them. A ripping action (as with a dozer) affects roots of one (1) or more trees far beyond the point of contact. Roots left jagged are also unable to produce the callous growth necessary to close the wound; thus decay becomes more extensive. In addition, cleanly cut roots can generate new roots more readily than torn roots.

The soil pH is an important factor in the functioning of the root system. Leaching of the lime from concrete can increase alkalinity to potentially lethal levels.

Approximately 99 percent of a tree's roots occur within the first three (3) feet of soil and most of the fine feeder roots which collect the moisture and nutrients are located in the first twelve (12) inches of soil.

Typically, a tree's root system extends as much as two (2) to three (3) times the distance to the dripline.

4.4.2 Trunk

A tree's trunk serves as a conduit for nutrients and water going to the leaves and food materials going to the roots. In addition, it is a major food reserve storage area.

The sapwood contains the cells which serve as the upward transport system for nutrients and water. In most trees, the sapwood is found within the last few inches of the outer trunk wood.

The phloem, located in a very thin layer of cells just inside the bark, serves as the downward transport system for food materials, enzymes, hormones and other materials produced by the leaves.

The cambium is the tissue layer located between the phloem and sapwood that creates the cells for both transport systems.

The proximity of all these important structures to the outer extremities of the trunk and branches make their protection against injury so critical.

Contrary to popular belief, tree wound dressing is not a corollary to antiseptics used on animal wounds which prevent infection and promote healing. The only sure cure is prevention where trees are concerned. Trees never "heal" wounds, but rather, seal off or compartmentalize the affected area provided all conditions are right for such activity. There are arboricultural techniques which can increase the chances of a tree successfully compartmentalizing some wounds, but simply applying tree wound dressing is not chief among them. (Note: Because tree wound dressing masks odors emitted by the wounds

which attract insect vectors, it is a vital procedure in the protection of oak trees against the oak wilt fungus. Tree wound dressing should be applied to oaks immediately after wounding.)

The root collar is the interface of the tree trunk and root system evidenced by a flaring of the trunk near the ground surface. The proximity of this structure to the root system promotes the misconception that the root flare can be covered with fill such as top soil dressing. This portion of the trunk is not adapted to the same conditions as the underground roots. In addition to reducing aeration, fill material which tends to keep the root flare and trunk area moist, can facilitate invasion by soil borne fungi and insects. When this happens, the tree trunk can be girdled by decay agents, resulting in death. Some species of trees are more susceptible to this than other; however, covering the root flare should be avoided as a general rule.

4.4.3 Crown

The tree's branches and leaves make up the crown. Branches serve the same transport and food storage function as the trunk in addition to giving rise to the leaves. Leaves manufacture the food and other substances required to sustain the whole tree.

Removal of more than 30 percent of a tree's crown can severely impact the tree's ability to provide sufficient food quantities for continued growth or protection against debilitation by disease.

APPENDIX A: CLASSES OF TREES

Class I

Carya spp. - Hickories
Carya illinoensis - Pecan
*Diospyros texana - Texas persimmon
*Ilex opaca - American Holly
*Ilex vomitoria - Yaupon Holly
Juglans nigra - Black Walnut
Liquidambar styraciflua - Sweetgum
Magnolia grandiflora - Southern Magnolia
Magnolia virginiana - Sweetbay
Nyssa sylvatica - Tupelo
Pistacia chinensis - Chinese Pistache
*Prunus mexicana - Mexican Plum
Quercus alba - White Oak
Quercus falcata - Southern Red Oak
Quercus lyrata - Overcup Oak
Quercus macrocarpa - Bur Oak
Quercus muehlenbergii - Chinkapin Oak
Quercus nigra - Water Oak
Quercus nuttallii - Nuttall Oak
Quercus shumardii - Shumard Oak
Quercus texana - Spanish or Texas Oak
Quercus virginiana - Live Oak
Taxodium distichum - Baldcypress
Ulmus crassifolia - Cedar Elm

Class II

Acer rubrum - Red Maple
Betula nigra - River Birch
Bumelia lanuginosa - Gum Bumelia
*Cercis canadensis - Redbud
*Crataegus spp. - Hawthorns
Diospyros virginiana - Eastern Persimmon
*Ehretia anacua - Anaqua
*Ginkgo biloba - Ginkgo
Juniperus spp. Junipers, Cedar

*Lagerstroemii 'Natchez' - Crapemyrtle
Liriodendron tulipifera - Tulip-poplar
Pinus elliotii - Slash Pine
Pinus taeda - Loblolly Pine
Pinus thunbergii - Japanese Black Pine
*Pistacia chinensis - Chinese Pistachio
*Prunus cerasifera - Purple Leaf
*Pyrus calleryana - Callery Pear Cultivars
Prunus caroliniana - Carolina Cherry-Laurel
Quercus phellos - Willow Oak
Quercus stellata - Post Oak
Quercus velutina - Black Oak
Sophora secundiflora - Mescal Bean Sophora
Sophora japonica - Japanese Pogodatree
Ulmus alata - Winged Elm
Ulmus americana - American Elm
Ulmus parvifolia - Chinese Elm
Ulmus parvifolia 'Drake' - Drake Elm

Class III

Betula nigra - River Birch
Cedrus deodora - Deodar Cedar
Celtis laevigata - Sugarberry
Celtis occidentalis - Common Hackberry
Cornus florida - Flowering Dogwood
Eriobotrya japonica - Loquat
Fraxinus pennsylvanica 'lanceolata' - Green Ash
Fraxinus velutina 'Torr' - Arizona Ash or Velvet Ash
Fraxinus velutina 'glabra' - Modesto Ash
Gleditsia triacanthos inermis - Thornless Honeylocust
Koelreuteria bipinnata - Southern Golden Raintree
Koelreuteria paniculata - Panicled Golden Raintree
Malus species and varieties - Flowering Crab Apples
Morus alba (fruitless) - Fruitless Mulberry
Parkinsonia aculeata - Palo Verde
Persea borbonia - Redbay
Pinus echinata - Shortleaf Pine
Platanus occidentalis - American Planetrees, Sycamore
Prosopis glandulosa - Honey Mesquite

Sapindus saponaria var. drummondii - Western Soapberry

Class IV

Acer negundo - Boxelder
Acer saccharinum - Silver Maple
Ailanthus altissima - Tree of Heaven
Albizia julibrissin - Silktree
Catalpa spp. - Catalpa
Celtis laevigata - Sugarberry
Chilopsis linearis - Desert willow
Cupressus arizonica - Arizona Cypress
Eleagnus angustifolius - Russian Olive
Firmiana simplex - Chinese Parasol Tree
Maclura azedarch - Chinaberry
Morus rubra - Red Mulberry
Pinus edulis - Pinion Pine
Pinus ponderosa - Ponderosa Pine
Populus spp. - Cottonwoods and Poplars
Prunus blireiana - Ornamental Plum
Robinia pseudoacacia - Black Locust
Salix spp. - Willows
Tamarisx spp. - Tamarisk
Thuja spp. - Arborvitae
Ulmus pumila - Siberian Elm
Ziyphus jujube - Jujube

ALL OTHER TREES OR AS DIRECTED BY THE CITY URBAN FORESTER

* Indicates suggested trees for planting under powerlines.

Amended by Steven Anderson

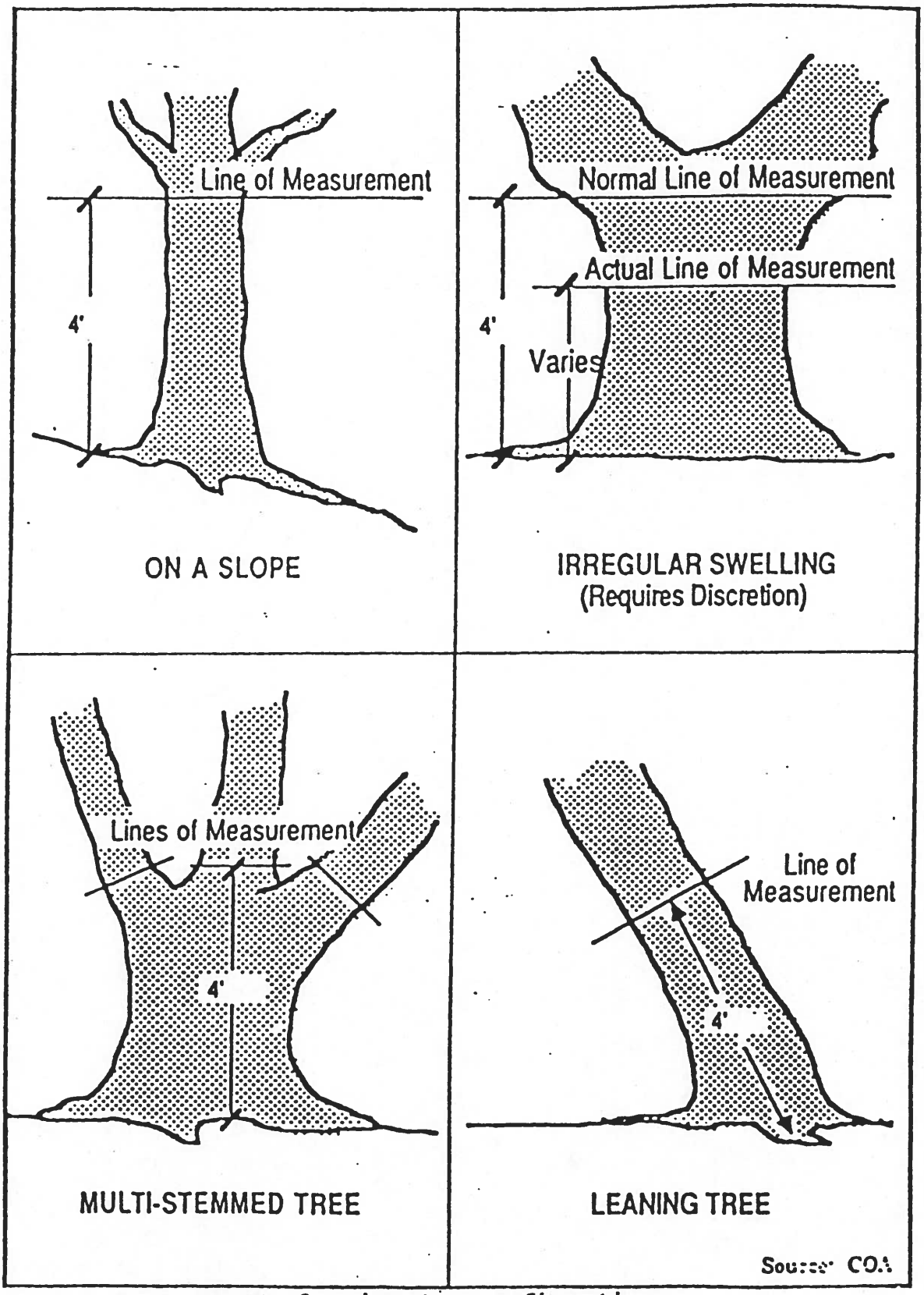


Figure 1. Measurement of various tree configurations

Critical Root Zone (CRZ) is deemed to be equal to the average crown spread, determined as set out below:

To determine the average crown spread of the tree, trace an outline of the tree's crown on the ground by placing stakes in the soil directly beneath the outer tips of the branches. A string with a plumb bob or other weight attached can be used to decide where to place the stakes.

Using an imaginary line that would pass through the center of the trunk, measure the distance between the two stakes farthest apart and the two stakes closest together on opposite sides of the tree. Add these two measurements and divide by two for the average width of the tree's crown.

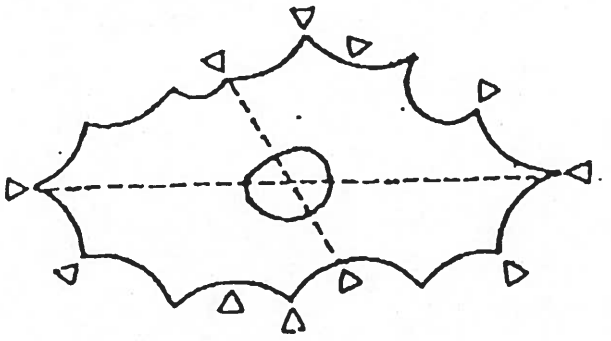


Figure 1b. Critical Root Zone (CRZ)

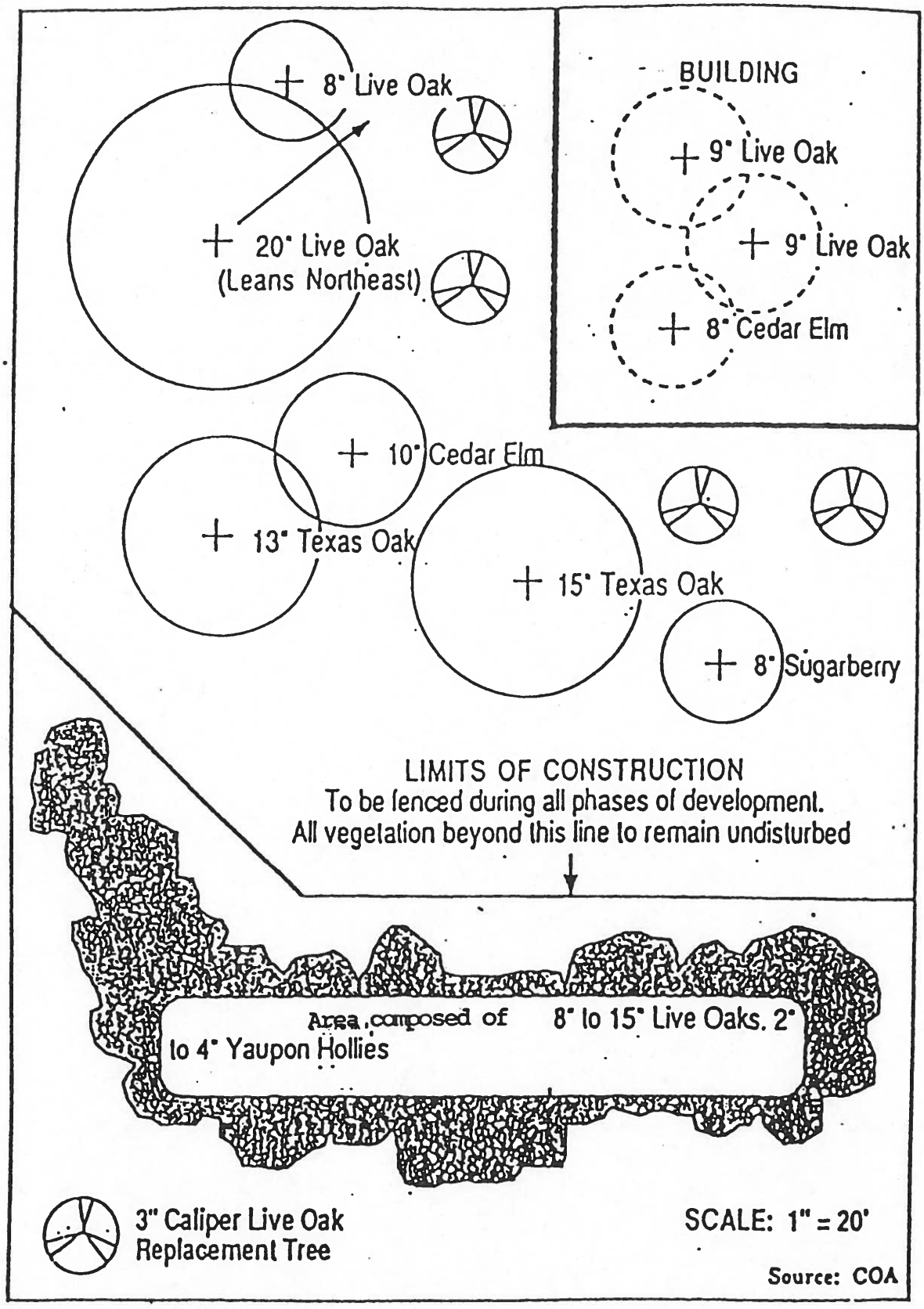
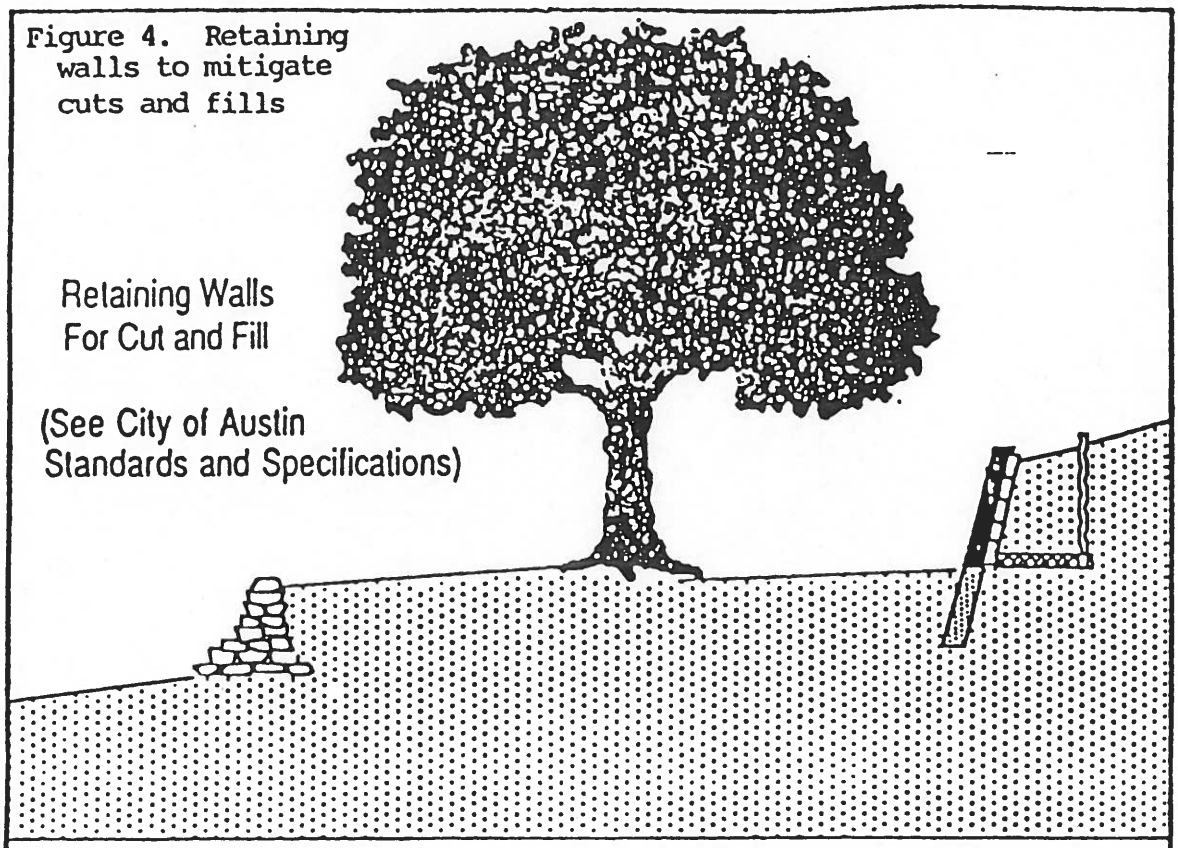


Figure 2. Example of typical plan graphics

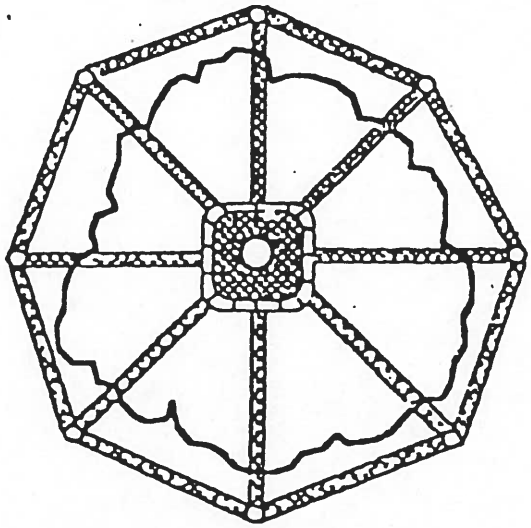
Figure 4. Retaining walls to mitigate cuts and fills

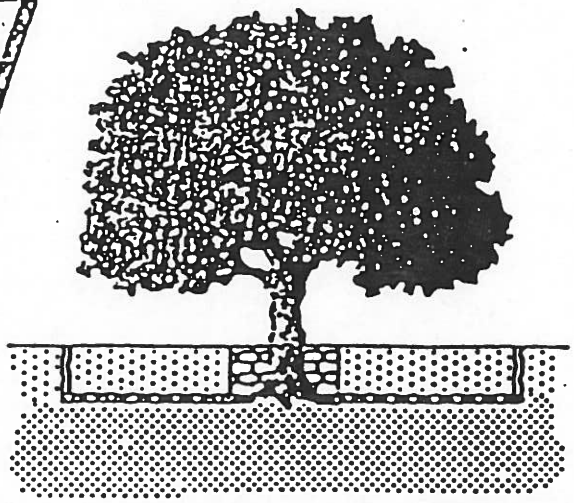


Retaining Walls
For Cut and Fill

(See City of Austin
Standards and Specifications)

Figure 3. Aeration systems for trees in fill areas

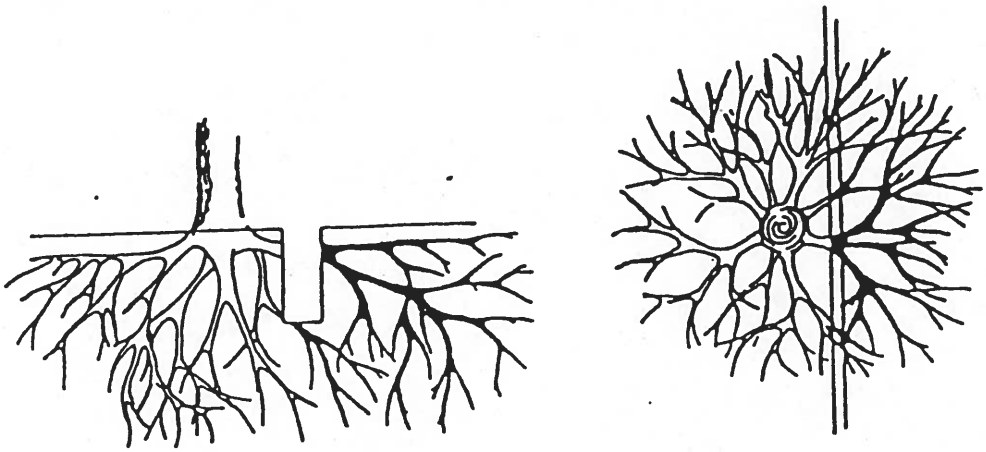




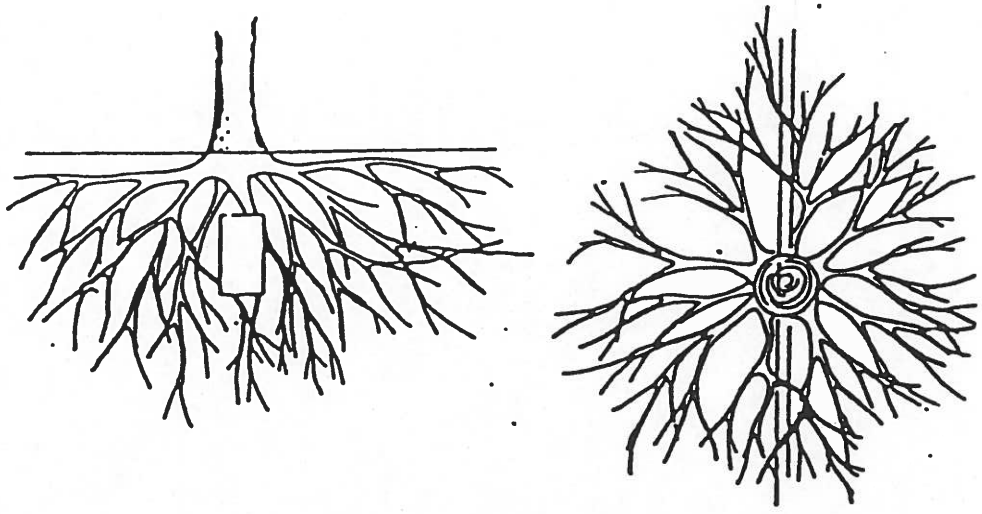
Aeration System
For Fill in the Critical Root Zone

(See City of Austin
Standards and Specifications)

Source: COA



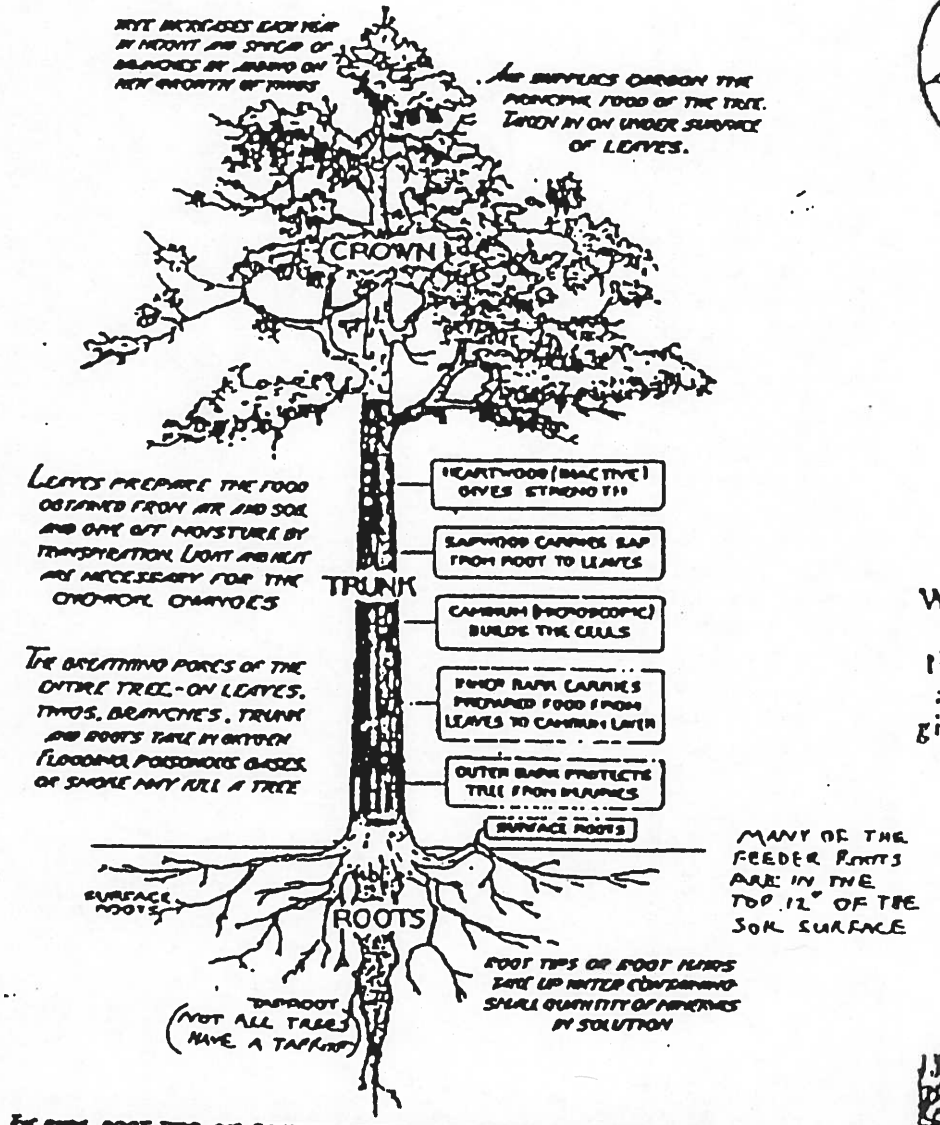
TRENCHING IMPACTS

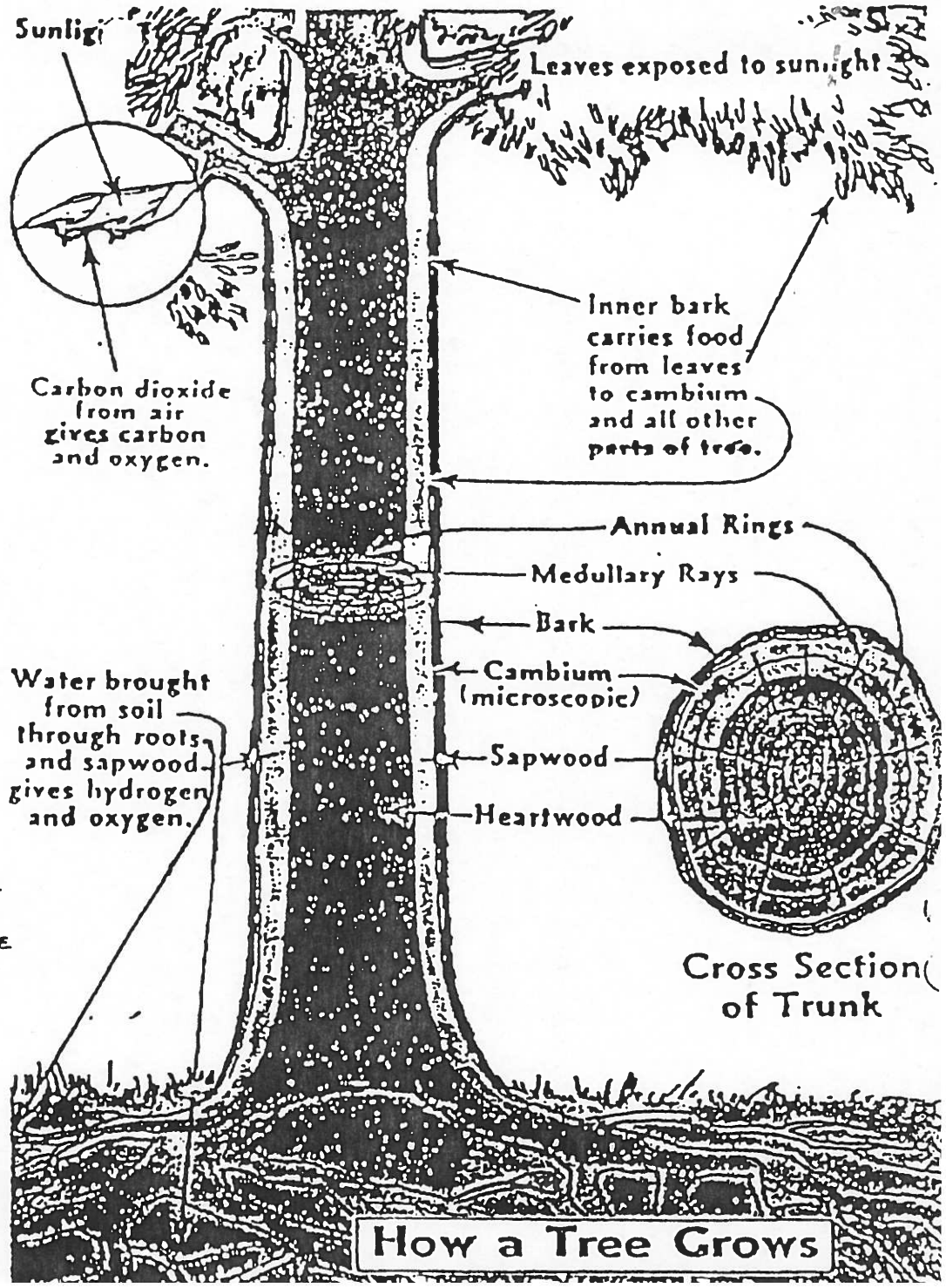


BORING IMPACTS

Source: COA

Figure 5. Minimizing root impact by boring


CROWN
TRUNK
ROOTS
HEARTWOOD (INACTIVE) GIVES STRENGTH
SAPWOOD CARRIES SAP FROM ROOT TO LEAVES
CAMBIUM (MICROSCOPIC) BUILDS THE CELLS
INNER BARK CARRIES PREPARED FOOD FROM LEAVES TO CAMBIUM LAYER
OUTER BARK PROTECTS TREE FROM INJURIES
SURFACE ROOTS
SURFACE ROOTS
TAPROOT (NOT ALL TREES HAVE A TAPROOT)


Sunlight
Leaves exposed to sunlight
Inner bark carries food from leaves to cambium and all other parts of tree.
Carbon dioxide from air gives carbon and oxygen.
Annual Rings
Medullary Rays
Bark
Cambium (microscopic)
Sapwood
Heartwood
Water brought from soil through roots and sapwood gives hydrogen and oxygen.
Cross Section of Trunk
How a Tree Grows

West University Place

Article XIV

URBAN FOREST PRESERVATION AND ENHANCEMENT

Section 6-501. Purpose; Findings.

(a) The purpose of this Article is to preserve and enhance the urban forest of the City.

(b) The City Council has determined the following: The urban forest is of great value in the maintenance of public health and welfare. The urban forest can aid in the conservation of vital energy resources and natural resources and in the preservation of the City's heritage and quality of life. Trees are a valuable amenity to the urban environment, creating greater human comfort by providing shade, cooling the air through evaporation, restoring oxygen to the atmosphere, reducing glare, reducing noise levels, providing an ecological habitat for songbirds and other animal and plant species, providing for more effective transitions between different land uses and breaking the monotony of urbanized development, pre-development, or construction. The urban forest of the City should be preserved and enhanced, to the maximum extent reasonably feasible, for future generations. Mature Trees, if destroyed, can be replaced only after generations of time.

Section 6-502. Definitions.

Unless the context otherwise clearly requires a different meaning, the following terms, as used in this Article, shall have the meanings indicated below.

Circumference. The Circumference of a Tree means the circumference of its trunk, measured as prescribed in the Criteria Manual and in Figure 1 attached to the Criteria Manual. For conversion to diameter the Circumference can be divided by 3.142.

Critical Root Zone means, for any given Tree, the area within a circle centered on the trunk location. The circle's diameter is one-half the sum of the broadest and the narrowest dripline diameters. See Figure 1b attached to the Criteria Manual.

Criteria Manual means the "Criteria Manual" dated June 19, 1992, a copy of which is on file in the office of the City Secretary. The Criteria Manual is approved, adopted and incorporated into this Article by reference.

Damage or Damaged. To "damage" a Tree means to take any action which could result in a Tree's death, either immediately or after a reasonable period of time. Some examples of such action, which are not intended to limit this definition, are as follows: severing the main trunk or large branches or large roots, girdling, poisoning, carving, mutilating, touching with live wires, piercing with nails or spikes, crushing or exposing the roots, digging or drilling any hole larger than three cubic feet (or a trench) within the Critical Root Zone, covering a substantial part of the Critical Root Zone or compacting a substantial part of the soil in the Critical Root Zone.

Large Tree means a Tree with a Circumference of 19 inches or more. In case a Tree is removed, it is presumed to have been a Large Tree if the diameter of the stump is six (6) inches or greater, measured in any direction. (Also see the definition of Significant Trees.)

Located. A Tree is "Located" within a given Subject Site if any part of its trunk is within the Subject Site at ground level.

Multiple-Trunk Tree means a Tree with two or more trunks visibly connected above the ground.

Person means any individual, entity, corporation, trust, unincorporated organization, partnership, or any other form of entity.

Protected Tree means:

(a) A Large Tree Located within: (i) the front 25 feet of any existing or potential Building Site located within any Subject Site (measured from the Front Street Line of the Building Site), (ii) the area within each abutting street out to the centerline of the street, or (iii) for corner Subject Sites only, the side 10 feet of any Building Site located within the Subject Site (measured from the Side Street Line of the Building Site).

(b) A Significant Tree anywhere in the City.

Qualified Tree means any Tree listed in Class I or II of the Criteria Manual which has a trunk diameter of at least two inches, measured six inches above the ground.

Replacement Tree means a Tree meeting the minimum criteria for Replacement Trees as set out in the Criteria Manual and this Article.

Significant Tree means a Large Tree with Circumference of 36 inches or more. In case a Tree is removed, it is presumed to have been a Significant Tree if the diameter of the stump is twelve (12) inches or greater, measured in any direction. (Also see definition of Large Tree.)

Street Gutter Flow Line means the Street Gutter Flow Line of the curb adjacent to and bordering upon a Visibility Triangle. If there is no curb, the height restrictions set forth in this Article shall be based upon the actual level of the street adjacent to and bordering upon the Visibility Triangle.

Subject Site for any given Development or Pre-Development Activity includes:

(a) The Subdivided Lot upon which the Development or Pre-Development Activity would occur; and

(b) Any portion of an adjoining Subdivided Lot which:

(i) Is under common ownership with the first Subdivided Lot;

(ii) Is not part of another Subject Site; and

(iii) Has been included by the owner of the Subject Site by the submission of a plat, legal description of other document to the City showing the adjoining Subdivided Lot (or portion thereof) as part of the Subject Site for the given Building or Structure; and

(c) Any Street area (out to the centerline of the Street) abutting the Subdivided Lots described in (a) or (b) above.

Tree means a woody plant having one well-defined stem or trunk, a defined crown and a mature height of at least eight (8) feet.

Tree Disposition Plan specifies how Large Trees, which includes Significant Trees, and Critical Root Zones will be protected from Development and Pre-Development Activity. It may specify Large Trees to be relocated, removed, or replaced. Unless otherwise indicated in the Criteria Manual, the Tree Disposition Plan must depict for any given Subject Site: (a) every Large Tree Located in the Subject Site, and (b) every Large Tree Located elsewhere which has 30% or more of its Critical Root Zone in such Subject Site.

Tree Survey is an on-the-ground survey containing the location of Trees, their Circumferences, types (species), crown areas (dripline) and other data, all as more particularly described in the Criteria Manual. Unless otherwise indicated in the Criteria Manual, the Tree Survey must depict for any given Subject Site: (a) every Large Tree Located in the Subject Site, and (b) every Large Tree Located elsewhere which has 30% or more of its Critical Root Zone in such Subject Site.

Urban Forester means a Person so designated and acting under this Article.

Visibility Triangle means the area at a Street corner lying within a triangle beginning at the precise intersection point of the curbs of each of the two Streets forming the corner and extending twenty feet along each curb line away from the curb intersection point, with the third side being determined by drawing a straight line connecting the ends of such twenty-foot extensions. If there is no curb on such a Street, the twenty-foot line shall follow the central flow line of the ditch paralleling the uncurbed Street. The Visibility Triangle may include both public and private property.

Section 6-503. Permits Required for Trees Not Covered by A Tree Survey or Tree Disposition Plan Due to Development or Construction.

(a) *Permits Required.* In general, permits must be obtained by all Persons who wish to remove or Damage Protected Trees not covered by a Tree Disposition Plan (that is, Protected Trees not involved with

Development or Pre-Development Activity on a Subject Site). See Section 6-509 for a more particular description of the requirement for a permit.

(b) *Criteria For Issuance Of Permits.* The Building Official shall only issue a permit under this section if (i) and either (ii) or (iii) are present:

(i) Application.

An application for the permit must be filed by the owner of the Subject Site where the activity would occur.

(ii) Tree in Poor Condition.

A permit shall be issued without penalty or cost (including the requirement of any Replacement Trees) if the Tree in question is diseased, severely damaged or dead on the Subject Site.

(iii) Tree is Impediment to proposed use of the Subject Site.

The Tree in question causes an unreasonable impediment to use and enjoyment of the Subject Site. Any permit issued under this subparagraph shall be reviewed by the Urban Forester for determination of the requirement of any Replacement Trees.

(c) *Conditions Required.* Any permit issued under subparagraph (iii), above, must require that any Replacement Tree required by this Article be planted and, if Located on a Subject Site controlled by the applicant, be thereafter maintained. If the permit would authorize Damage to a Protected Tree, the permit must contain conditions reasonably calculated to minimize the Damage to the Protected Tree.

Section 6-504. Requirement for Tree Surveys and Tree Disposition Plans Due to Development or Construction on Subject Site.

(a) *Required For Pre-Development And Development Permits.* The Building Official shall not issue any permit for any Development or Pre-development Activity within the City unless the following documentation has been delivered to the Building Official, or the Urban Forester:

(i) Tree Survey

A Tree Survey must have been filed and approved by the Urban Forester as being in compliance with this Article before the commencement of any activity (including, without limitation, demolition).

(ii) Tree Disposition Plan

A Tree Disposition Plan for the activity and the affected areas on the Subject Site must have been filed and approved by the Urban Forester as being in compliance with this Article.

(iii) Permit Conditions Inserted.

The building permit must contain an express condition prohibiting the removal, Damaging or death of any Large Tree except as authorized by an approved Tree Disposition Plan.

(b) *"Low-Impact" Exception.* This section does not apply to a Subject Site, project or other activity that will not have any significant, adverse effect upon any Large Tree, as determined by the Urban Forester.

(c) *Criteria For Decisions.* A Tree Disposition Plan shall not authorize the removal, Damage or death of a Large Tree unless the Tree is diseased, severely damaged or dead, or unless it causes an unreasonable impediment to the use and enjoyment of the applicant's property. As a condition to removing the subject Tree, a Tree Disposition Plan shall require Replacement Trees to the extent provided in the Criteria Manual. If a Tree

Disposition Plan permits Damage to a Tree, the Tree Disposition Plan shall include conditions reasonably calculated to minimize the Damage.

Section 6-505. Replacement Trees; Streets.

(a) *Number of Replacement Trees.* A permit or Tree Disposition Plan which authorizes the removal of or Damage to a Protected Tree shall normally require that the Protected Tree be relocated or replaced with one or more newly planted Trees on the same Subject Site, or, if requested by the applicant and so agreed by the Urban Forester, in the proximity of the Subject Site, subject to the provisions of the Criteria Manual.

(b) *Minimum Size.* Replacement Trees must normally have a trunk diameter of at least two inches measured six inches from the ground. The Urban Forester may prescribe a proportionally smaller trunk diameter for species of Trees typically smaller than normal.

(c) *Qualified Trees Under Zoning Ordinance.* To be a "Qualified Tree" under the Zoning Ordinance, a Tree must comply with the definition of "Qualified Tree" set out in this Article.

(d) *Standard of Review.* The Urban Forester shall use reasonable best efforts to determine the type and number of Replacement Trees required in an attempt to minimize any undue burden resulting from this Article.

(e) *Trees In Streets.* Before issuing or approving a permit or Tree Disposition Plan to authorize establishing or maintaining a Tree or decorative landscaping (or any related appurtenances such as lighting or a watering system) in a Street, the Building Official must: (i) be satisfied that TEX. REV. CIV. STAT. art. 1085c has been complied with and (ii) determine there would be no violation of the provisions of this Article relating to Visibility Triangles. The Building Official is designated by the City Council to make the determinations contemplated by Section 3 of said art. 1085c.

Section 6-506. Protective Fencing.

(a) *Fences Required.* Unless otherwise specified in the applicable Tree Disposition Plan, each Protected Tree to be preserved must be fenced during Development or Pre-Development Activity.

(b) *Fence Criteria.* The Tree Disposition Plan shall specify protective fencing of the Critical Root Zone whenever reasonably practicable, unless a different area is prescribed in accordance with the Criteria Manual. Unless the Tree Disposition Plan specifies otherwise: (i) a six-foot fence must surround each Protected Tree or group of Protected Trees, effectively preventing Persons, machinery, trash, material and other items from occupying the area within the protective fencing, and (ii) the fence may incorporate existing fences or walls as well as temporary fencing.

(c) *Fence Permit.* A separate fence permit is not required for construction of a fence under this section, if a building permit for the work is in effect and a Tree Disposition Plan has been approved.

(d) *Trash, Storage Prohibited.* It shall be unlawful for any Person to use the area within the protective fencing, required by this section, for trash disposal, storage, vehicle parking or any other use that could adversely affect tree roots.

Section 6-507. Visibility Triangles.

It shall be unlawful for any Person to plant, grow or maintain any plant, except a Tree, within a Visibility Triangle, if the plant has (or probably will have) a height greater than three feet above the Street Gutter Flow Line. It shall be unlawful for any Person to plant, grow or maintain a Tree which has branches or foliage within or above a Visibility Triangle at a height lower than fifteen feet above the Street Gutter Flow Line. It is presumed that a Person who owns or controls real property within the City maintains all Trees and plants on that property. The City may enter a Visibility Triangle and remove growths prohibited by this section, and there shall be no liability to others for taking or not taking such action.

Section 6-508. Administration; Information; Cooperation; Appeals.

(a) *Urban Forester.* The City Manager shall appoint an experienced and qualified Person to be chief Urban Forester for the City, which shall be a full-time, City employee position. The City Manager may designate one or more other Urban Foresters to act in the absence of the chief; persons so designated may not necessarily be employees of the city, but the City Manager shall make an adequate provision for obtaining their services by contract if they are not City employees. A person designated as Urban Forester must hold at least a bachelor's degree from an accredited four-year college or university in urban forestry or arboriculture or must have equivalent skills and experience.

(b) *Referral; Duties.* The Building Official shall refer Tree Surveys, Tree Disposition Plans and applications for Tree permits to a designated Urban Forester, who shall work with the applicant and other City departments as required to administer the provisions of this Article. The Urban Forester may establish categories of simple, routine or low-risk surveys, plans and applications, which may be handled summarily, without submission to the Urban Forester. The fees for such applications may be reduced accordingly, if so provided in the fee schedule.

(c) *Applicability to City Projects.* For all City projects that may impact Large Trees, the appropriate documents (Tree permits or Tree Surveys and Tree Disposition Plans) shall, whenever practicable, be submitted to the Urban Forester for evaluation and recommendations, prior to public hearings (if held) or final decisions taken by City council or City staff. City approval of a City-owned Subject Site or project shall constitute approval for actions affecting the Trees. City-owned Subject Sites or projects shall follow the same guidelines for Tree replacement as private Subject Sites or projects, except as authorized by City Council.

(d) *Reference And Training.* The City Manager is authorized to obtain training and reference materials for the Building Official and other City staff members who may be called upon to enforce this Article. The Building Official is authorized to maintain reference materials on file and to make them available, without charge, to Persons who request information in connection with construction or other activities within the City that could affect the urban forest.

(e) *Cooperation.* It is the desire of the City to establish a cooperative working relationship with Persons seeking to improve property within the City. Interested Persons are invited and encouraged to meet and confer with City staff and to retain the services of expert foresters to provide advice and assistance to themselves and the City. The Urban Forester shall use reasonable best efforts to determine the type and amount of Replacement Trees required in an attempt to minimize any undue burden resulting from this Article.

(f) *Decisions And Appeals.* When making decisions or performing other duties under this Article, the Urban Forester and the Building Official both shall be subject to the standards and procedures generally applicable to the Building Official under this Chapter (see, e.g., Sections 6-11, et seq.). Appeals of decisions made by either the Building Official or the Urban Forester, and applications for variances, are heard by the Building and Standards Commission, in accordance with this Chapter.

Section 6-509. Violations.

(a) *Removal, Damaging, Killing of Protected Trees.* Except as authorized by a permit issued under this Article, it shall be unlawful, at any time: (i) for a Person to remove, Damage or kill a Protected Tree within the City; (ii) for a Person, who owns or controls any existing or potential Subject Site, to cause or allow a Protected Tree to be removed, damaged or killed if it is Located within the Subject Site.

(b) *Affirmative Defenses.* It shall be an affirmative defense to prosecution under this Article that: (i) immediate action to remove, Damage or kill the Tree in question was necessary to prevent harm to Persons or property, (ii) a permit application was filed within five days thereafter, (iii) an appropriate permit or amendment was obtained, (iv) there was full compliance with all conditions of the permit or amendment, or (v) an approved Tree Disposition Plan (contained in a building or other permit) authorized and sanctioned the conduct in question.

(c) *Conditions.* It shall be unlawful for any Person who applies for or receives a permit regulated by this Article to fail or to refuse to comply with a condition of the permit or this Article. Any related permit for the

Building Site in question may be withheld until the condition is complied with to the satisfaction of the Urban Forester, building official or any other City staff members who are called upon to enforce this Article. All permits are subject to revocation or suspension as provided for in this Chapter (see, e.g., Section 6-25).

Section 6-510. Other Regulations; Conditions

(a) *Conflicts With Other Regulations.* In any case where another City ordinance, rule or regulation would require the removal, Damage or death of a Large Tree, under circumstances where this Article would prohibit such action, it is the intent of the City Council that all of the Applicable Regulations shall be read together and harmonized so that, if reasonably practicable, the Large Tree is not removed, Damaged or killed.

(b) *Liberal Interpretations Authorized.* All City officials, boards and commissions are authorized and encouraged to interpret other ordinances, rules and regulations liberally in order to minimize conflicts with this Article and to protect existing Large Trees, except in circumstances where there might be hazards to Persons or property.

(c) *Variances.* The need to protect or preserve a Large Tree shall be considered a sufficient "hardship" in all cases where a hardship is required for the issuance of a variance under City ordinances, unless additional grounds are required by state law.

b3:\otreefnl.54

WORKSHOP - PLANNING AND ZONING COMMISSION OF THE CITY OF PEARLAND, TEXAS, TO BE HELD TUESDAY, MARCH 2, 1993 IMMEDIATELY FOLLOWING THE SREGULAR MEETING IN THE COUNCIL CHAMBERS, CITY HALL, 3519 LIBERTY DRIVE, PEARLAND, TEXAS

PURPOSE OF WORKSHOP

1. **Discussion of Tree Protection Ordinance**

ADJOURN

POSTED: 26th DAY OF February, A.D., 1993 4:10 P.M.

REMOVED: 5th DAY OF March, A.D., 1993.

W.S. mtg postponed as per Richard Burdine because regular meeting was so long