

CRITERIA MANUAL

CITY OF PEARLAND, TEXAS

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IMPORTANT NOTICE

This manual is to be used and interpreted in accordance with the City's Ordinance on urban forest preservation and enhancement. Unless the context indicates that another meaning is intended, terms used in this manual have the same meanings as in said Ordinance.

1. TREE SURVEY STANDARDS

1.1. REQUIRED DATA FOR TREE SURVEY OR TREE DISPOSITION PLAN

Required Tree Data for a Tree Survey or Tree Disposition Plan must be obtained from an on-the- ground survey. The data that must be obtained in the field are tree locations, trunk circumferences, types (species), and crown area (Critical Root Zone), as explained below:

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, measuring the distance to the center of the trunk from two (2) known points is a viable option.

1.1.2 Circumference

The distance around the perimeter of the tree trunk as measured four and one-half feet (4.5') above the ground using an ordinary measuring tape. For multiple-trunk trees, the trunk circumference is deemed to be equal to the circumference of the largest trunk plus half the circumference of each additional trunk. Measurements should be accurate to the nearest one-half inch ($\frac{1}{2}$ "). For conversion to diameter, the circumference can be divided by 3.142.

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); *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 (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 drip line diameters. (See Figure 1b, attached).

The Critical Root Zone and crown information will be useful in assessing the impact of projected construction.

1.2 RECOMMENDED ADDITIONAL FIELD DATA

1.2.1 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 the trees unless they have the necessary credentials; however, if a tree is obviously in poor condition, it should be noted.

1.2.2 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 an 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

Trunk locations of trees proposed to be retained are to be represented by solid circle, while trees proposed to be removed are to be represented by unfilled circle. Proposed replacement tree locations are to be represented by a solid star. Refer to Figure 2.

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).

1.3.3. Sizes and Types

Tree circumferences and types must also be shown in 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 a 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.

2. TREE PRESERVATION MEASURES

2.1 TREE PRESERVATION CRITERIA

2.1.1 Critical Root Zone Impacts

Although a tree's root system ranges well beyond the drip line, for the practical purposes of this Criteria Manual and the Ordinance, 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. Likewise, the Urban Forester may determine that it is not necessary to protect areas within the CRZ where they 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 CRZs.

- A minimum of 75% of the CRZ must be preserved at natural grade, with natural ground cover.
- No cut or fill greater than two (2) inches will be located within the inner ¼ of the CRZ.

In order to ensure that root zones are adequately preserved, protective fencing should be erected to enclose the area 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).

2.1.2 Crown Impacts

A maximum of 25% of the viable portion of a tree's crown may be removed.

2.1.3 Deviations from the 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's Urban Forester prior to the adjustments being made.

2.1.4 Soil Compaction

The new grade within the CRZ should not be compacted to grade, but allowed to settle over time. New grade may be mulched with 2 to 4 inches of pine bark mulch.

2.2 Utilities

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

- Establish the trenches for underground utilities where they will have the least impact on trees.
- Stack underground utility lines to reduce the number of trenches required.
- Bore or tunnel under trees to minimize root impacts. (See Figure 5).
- Hand-dig trenches to preserve roots one inch (1") in diameter and larger.
- When planting trees, plant low-growing trees under power lines.
- Existing underground structures within the Critical Root Zone of any tree should remain in place, unless removal is necessary for installation of new structure.

3. MITIGATIVE MEASURES AND REPLACEMENT TREES

Many of the existing trees in the City grow very slowly, making preservation very critical in order 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's 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, fertilizing, soil aeration, spraying, etc.

Tree Maintenance should include the following:

- Water all trees most heavily impacted by construction activities deeply once a week during periods of hot, dry weather. As a rule of thumb, a weekly application of approximately 50 gallons of water per one inch diameter applied slowly to the root zone will be sufficient.
- Paint wounds (including limb pruning and root trimming) on oaks immediately with an acceptable non-toxic pruning paint labeled for horticultural use to decrease the incidence of Oak Wilt disease.
- Spray tree crowns with water periodically to reduce dust accumulation on the leaves.

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:

- A signed service contract for review and approval by the City, and
- Fiscal security in an amount equal to the going rate for the approved service.

These measures are necessary because the remedial care program must typically extend over a minimum 18-24 month period after completion of the project.

APPENDIX A: PROTECTED TREE LIST

REPLACEMENT TREES: Minimum Criteria for replacement trees – DBH of at least two inches (2”) measured six inches (6”) above grade.

<u>Botanical Name</u>	<u>Common Name</u>
Acer Barbatum, rubrum	Red Maple
Carya spp.	Hickory, Pecan
Ilex opaca	American Holly
Liquidamber Styraciflua	Sweet Gum
Magnolia spp.	Magnolia species
Quercus spp.	Oak species
Taxodium spp.	Cypress species
Ulmus spp.	Elm species
Juglam Nigra	Black Walnut
Fraxinus Pennsylvanica	Green Ash
Pistacia Chinensis	Chinese Pistache

APPENDIX B: WARNING SIGN REQUIRED FOR TREE PROTECTION FENCING

TREE PROTECTION FENCING
Required by Code of Ordinances
City of Pearland

DO NOT REMOVE FENCE OR SIGN!
FINE UP TO \$500. JOB MAY BE SHUT DOWN

**CERCAS PARA
PROTECCIÓN de ARBOLES**
Require por Ordenaciones de la
Ciudad de Pearland

¡FAVOR DE NO REMOVER!
MULTA DE: HASTA \$500. TRABAJO PEUDE SER TERMINADO.