



CITY OF PALM COAST TECHNICAL MANUAL

SECTION III: LANDSCAPING



EFFECTIVE NOVEMBER 2ND 2016

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I. INTRODUCTION

A. Purpose

The purpose of this Manual is to supplement the regulations and provide more detailed specifications relating to the tree protection, landscaping, buffers and irrigation requirements of Chapter 11 of the City of Palm Coast Land Development Code (LDC). (Note: See Chapter 14 of the LDC for definition of zoning term abbreviations used through this Section.)

B. Intent

It is the intent of the City of Palm Coast (City) that the information presented in this manual will help to ensure implementation of specific regulations established to protect, install and maintain trees, vegetation, and other landscaping elements in order to achieve an environmentally friendly community.

II. MEASUREMENT OF TREES (Section 11.01, LDC)

A. Existing Trees

The size of existing trees shall be calculated by the measurement of the diameter of the trunk in caliper inches, taken at breast height, which is four and one-half (4½) feet above grade. If a tree has a single fork below this height, it shall be considered to be two (2) separate trees for removal and mitigation purposes.

B. New Landscape Trees

The size of new landscape trees shall be calculated by measurement of the diameter of the trunk at six (6) inches above grade, up to and including trees four (4) inches in diameter. The size of trees over four (4) inches in diameter shall be calculated by measurement of the diameter of the trunk at twelve (12) inches above grade.

III. TREE PRESERVATION, PROTECTION, AND REPLACEMENT (Section 11.02, LDC)

A. Tree Survey Requirements

The required tree survey shall be current (accomplished within the last twenty-four (24) months) and shall identify all protected, specimen, and historic trees within the prescribed survey limits by species name and the size of the trunk measured at the diameter at breast height. Appendix A of this manual provides a "Tree Survey Inventory Sheet", which must be filled out and submitted with the development or plot plan application if protected trees are proposed for removal.

1. Tree Survey for MFR/COM/ IND and SUBD Developments

The tree survey shall show all protected trees six (6) inches diameter at breast height within the required buffer width. An additional width of five (5) feet outside the property limits is also to be surveyed for protected trees.

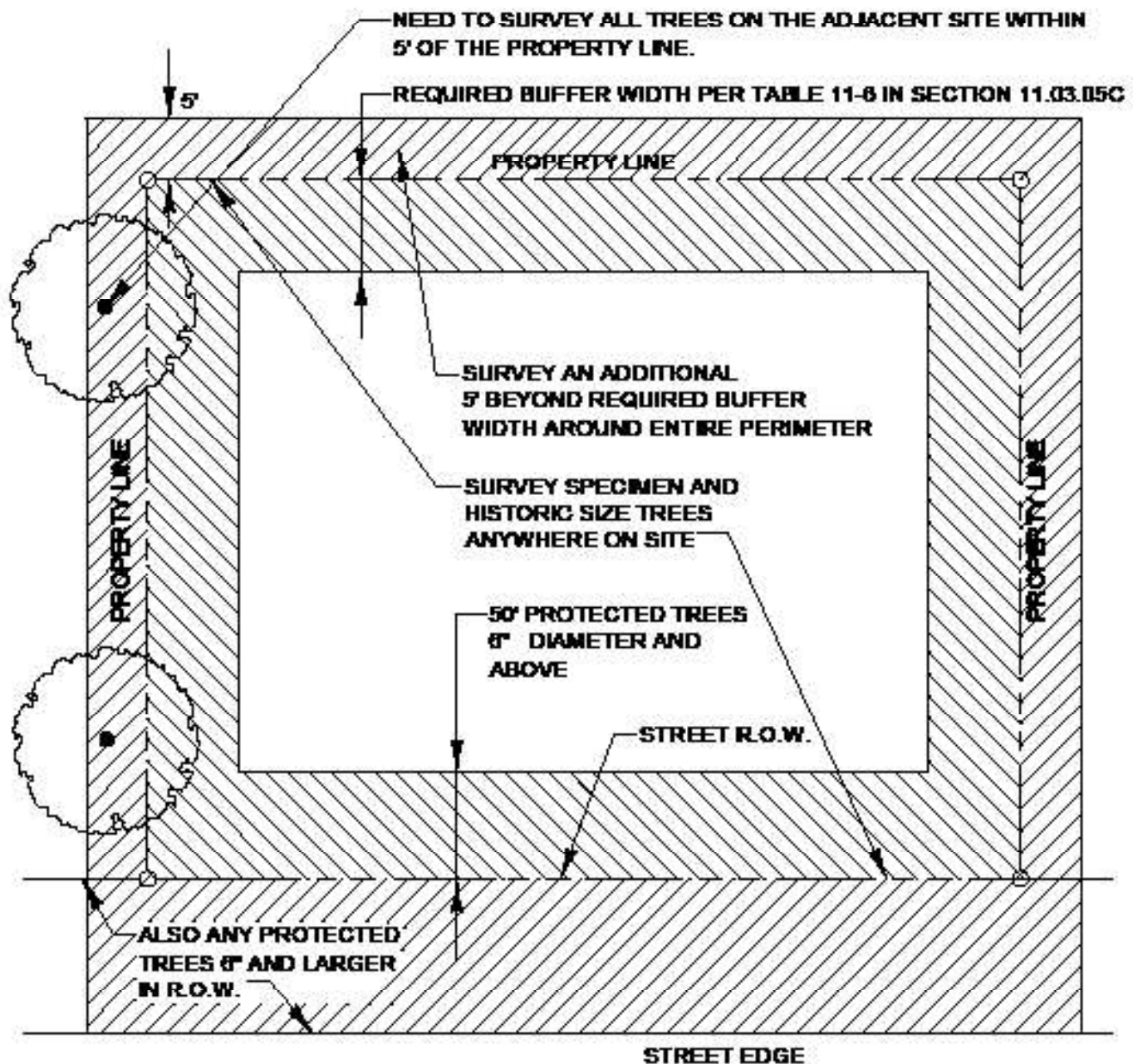
All specimen and historic trees shall be individually located and identified over the entire site as to species and size.

TREE SURVEY REQUIREMENTS

(APPLIED TO ALL MFR/COM, IND & SUBD DEVELOPMENT)

FOR CLARIFICATION, HERE ARE THE BASICS:

1. **MUST SHOW 8" DIAMETER AND ABOVE PROTECTED TREES WITHIN THE REQUIRED SURVEY AREAS.**
2. **MUST SHOW ALL SPECIMEN TREES LOCATED ANYWHERE ON THE SITE. (EXCEPT WETLANDS THAT ARE IN CONVERSATION.)**
3. **SURVEYED AND SAVED TREES WITH A DIAMETER $> 3.5"$ BUT LESS THAN THE MINIMUM OF 8" DIAMETER CAN QUALIFY FOR CREDIT, IF LOCATED WITHIN THE PERIMETER BUFFER AREAS.**

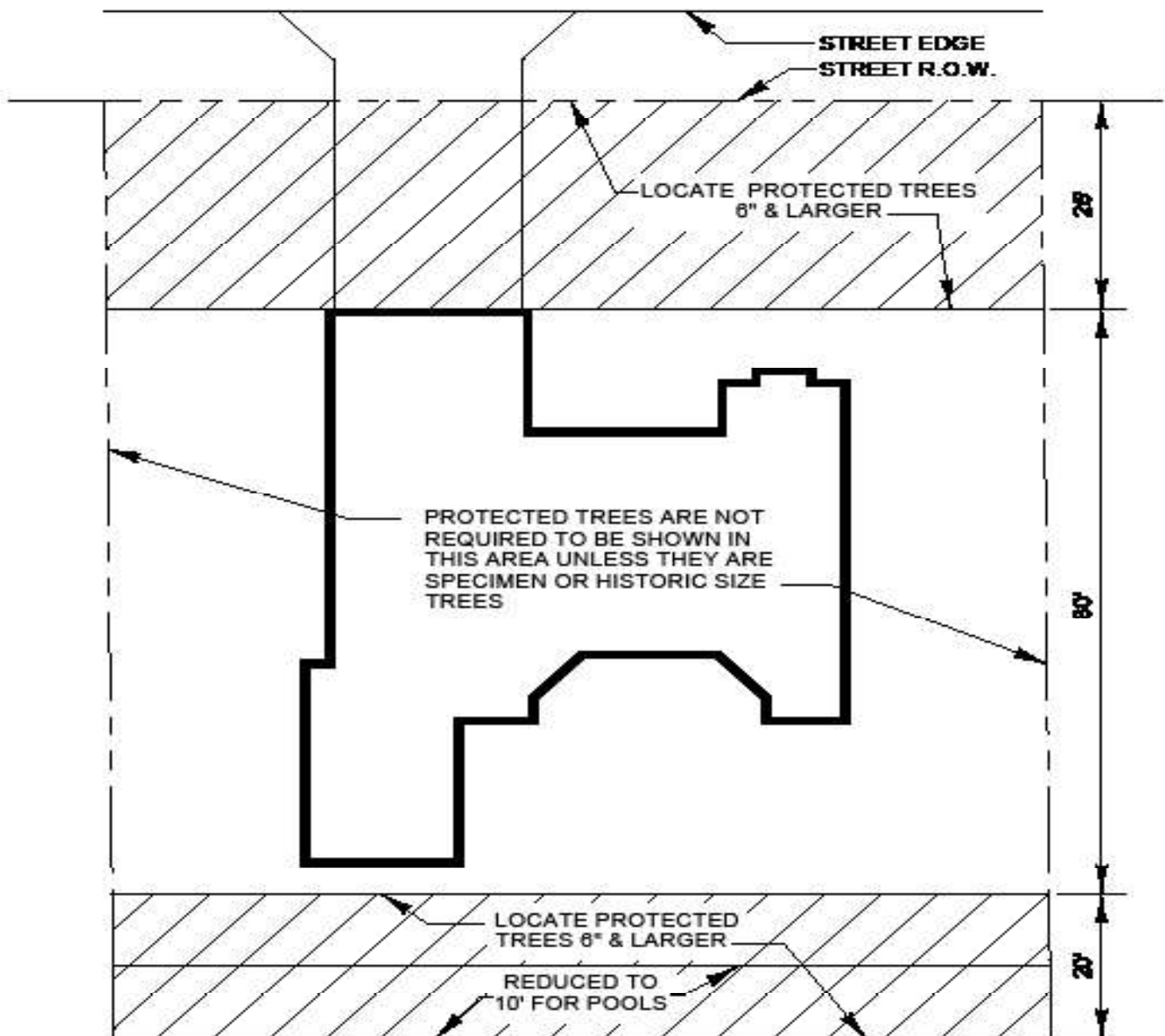


2. Tree Survey for SFR/DPX Developments

Protected trees six (6) inches or greater diameter at breast height within all front, rear, and street side building setback areas shall be shown on the tree survey if the trees are going to be used for credits. Specimen and historic trees shall be surveyed over the entire lot except as provided in lot section 11.02.02D.

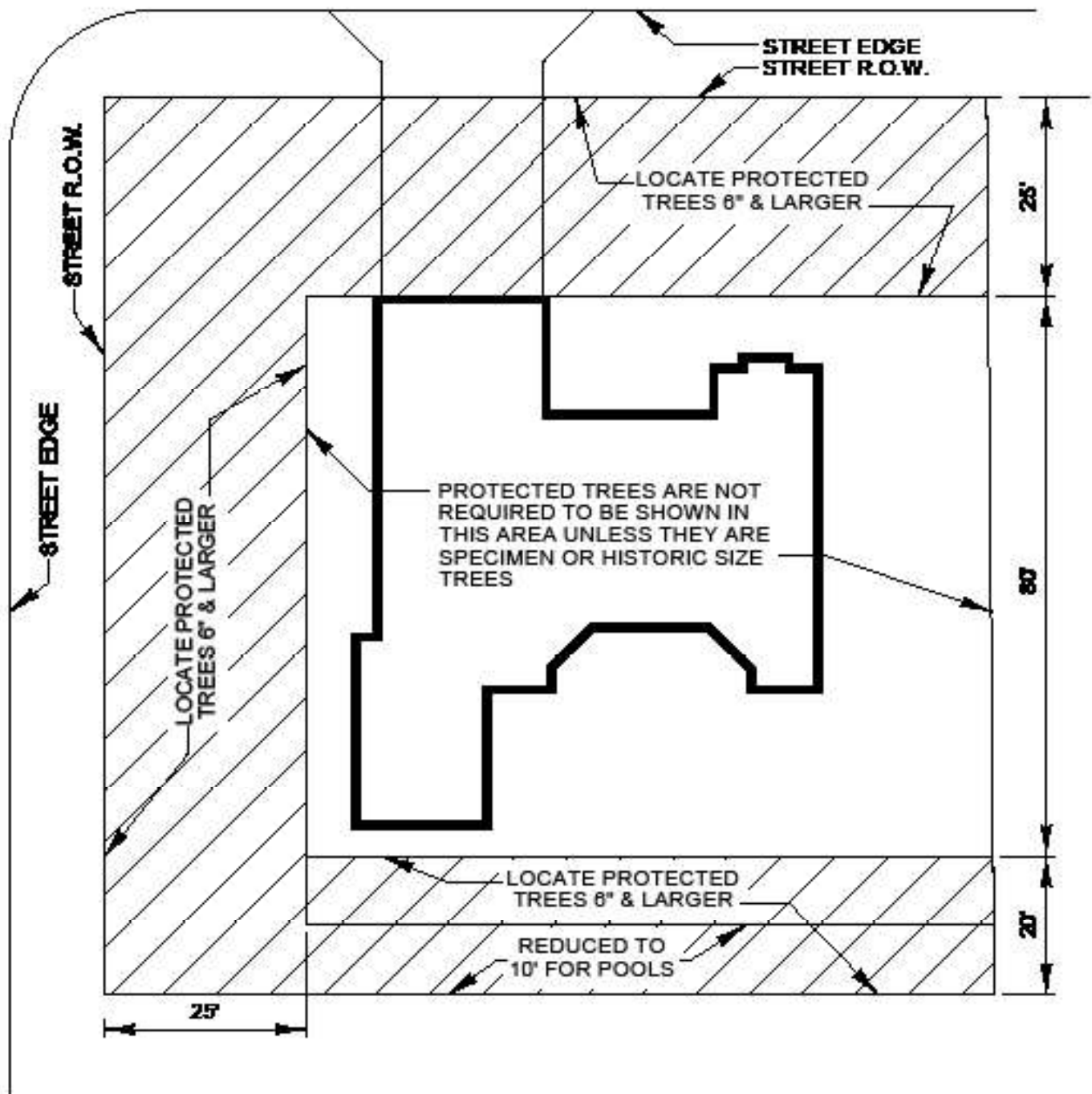
TREE SURVEY REQUIREMENTS (APPLIED TO ALL SFR/DPX DEVELOPMENT)

1. **EXEMPTING SIDE YARDS ENTIRELY (EXCEPT ON SIDE STREET LOTS)**
2. **PROTECTED TREES IN THE FRONT YARD SETBACK { 25' }**
3. **PROTECTED TREES IN THE REAR YARD SET BACK { 20' }**
4. **OTHER THAN FOR SPECIMEN AND HISTORIC TREES, IF EXISTING TREES ARE NOT INTENDED FOR CREDIT THEY ARE NOT REQUIRED TO BE SURVEYED.**
5. **IF EXISTING TREES ARE USED FOR TREE DENSITY CREDIT THEY MUST BE BARRICATED PER THE CITY STANDARD DETAIL.**



SURVEY REQUIREMENTS FOR SIDE STREET SETBACK (APPLIED TO ALL SFR/DPX DEVELOPMENT)

1. EXEMPTING SIDE YARDS ENTIRELY (EXCEPT ON SIDE STREET LOTS)
2. PROTECTED TREES IN THE FRONT YARD SETBACK (25')
3. PROTECTED TREES IN THE REAR YARD SET BACK (20')
4. OTHER THAN FOR SPECIMEN AND HISTORIC TREES, IF EXISTING TREES ARE NOT INTENDED FOR CREDIT THEY ARE NOT REQUIRED TO BE SURVEYED.
5. IF EXISTING TREES ARE USED FOR TREE DENSITY CREDIT THEY MUST BE BARRICADED PER THE CITY STANDARD DETAIL.



B. Invasive and/or Exotic Plants List

The following list includes, but is not limited to, plants that are exempt from the tree protection requirements of subsection 11.02.01 of the LDC. Additional plants may be categorized as exempt by the Planning Manager upon the determination that the plant is not climatically suitable to the USDA hardiness zone for Palm Coast. In addition to the invasive species noted in the following table, any plant species defined as a "Category 1" pest plant by the Florida Exotic Pest Plan Council (EPPC) or as an invasive plant listed by the Food and Agricultural Sciences Division of the University of Florida shall be removed upon development of the site and shall not be used in the landscaping of the site.

Invasive and/or Exotic Plants			
<u>COMMON NAME</u>	<u>BOTANICAL NAME</u>	<u>COMMON NAME</u>	<u>BOTANICAL NAME</u>
Australian Pine*	Casuarina spp.	Albizia Julibrissin	Mimosa
Orchid Tree	Bauhinia spp.	Nerium Oleander	Oleander
Brazilian Pepper*	Schinus Terebinthefolius	Punk Tree*	Melaleuca Leucadendron
Camphor	Cinnamomum Camphore		
Chinaberry	Melia Azedarach	Tree-of-Heaven*	Ailanthus Altissima
Chinese Tallow*	Sapium Sebiferum	Royal Palm	Roystonea spp.
Silk Oak	Grevillea Robusta	Silk Oak	Grevillea Robusta
Ear Tree*	Enterolobium Cyclocarpum		
Eucalyptus*	Eucalyptus species	Woman's Tongue	Albizia Lebbeck
Golden Rain Tree*	Koelreuteria Paniculata		

* Trees that are considered "Invasive Species" and shall be removed upon development of a site.

Examples of Trees That May Be Planted But No Credit Allowed (Other trees may be included if they are not climatically suited to Zone X hardiness zone)			
<u>COMMON NAME</u>	<u>BOTANICAL NAME</u>	<u>COMMON NAME</u>	<u>BOTANICAL NAME</u>
Apple	Malus spp.	Loblolly Pine	Pinus tadea
Nerium Oleander	Oleander	Slash Pine	Pinus
Orchid Tree	Bauhinia spp.	Long Leaf Pine	Pinus palustris
Citrus	Citrus species	Sand Pine	Pinus clausa
Leyland Cypress	Cupressocyparis leylandii	Queen Palm	Syagrus romanzoffiana
Sea Grape	Coccoloba unifera	Coconut Palm	Cocos nucifera
Peach	Prunus persica	Photinia	Photinia x Fraseri

C. Land Clearing in Subdivisions during Infrastructure Construction Stage

During the subdivision infrastructure construction stage, clearing of trees and existing vegetation shall be limited to the minimum necessary to construct roadway and utility rights-of-way and facilities. However, in order to accommodate development within a subdivision where fill is required to such a depth that it would preclude the survival of existing trees, lots may also be cleared provided:

1. A clearing and grading plan shall be submitted showing vegetation and tree areas to be preserved, the amount of fill needed for lot development based on existing grades, proposed roadway and building elevations, and drainage plans.
2. A minimum of fifty (50) percent of the existing vegetation within the required buffer areas shall be preserved unless provisions cannot be made as far as grading issues to prevent filling the area.
3. If lots are approved under this provision for clearing of protected trees during the subdivision infrastructure construction stage, all common areas must meet the minimum tree density requirement either by preserving existing trees or planting new trees.

D. Protection of Preserved Vegetation during Clearing and Construction Activities

In areas where protected trees have been identified on the tree survey, the City encourages the preservation of the protected trees, but also encourages the preservation and inclusion of the maximum amount of existing non-exotic and non-invasive understory vegetation. The techniques described below assure the survival of protected vegetation during site clearing and construction stages of a development project.

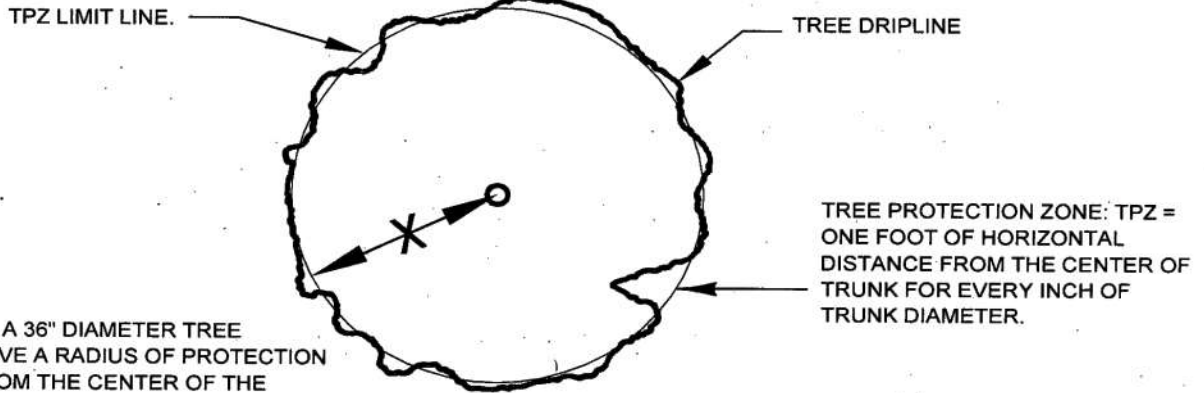
1. Tree Protection Zone (TPZ)

A tree protection zone (TPZ) shall be established around all protected trees, including canopy trees, specimen trees and historic trees. The standard TPZ shall be a circle around the trunk with a radius from the trunk equal to 1' for each inch of trunk diameter. e.g., a twelve (12) inches DBH tree should have a TPZ extending out from the trunk twelve (12) feet. There are times when a structure, driveway or other hardscape must be located closer than the TPZ limit and in those cases, the following requirements apply:

- a. Trees that are “intolerant” of construction activities shall not have the TPZ reduced (see exhibit for species labeled as “poor” in the list available from the City on Relative Tolerance of Selected Species to Development Impacts). If this must be done to facilitate construction, the tree shall be removed.
- b. Encroachment into the TPZ is permitted only on one (1) side of the tree, but shall never be closer to the tree than three (3) times the tree DBH.
- c. If encroachment into the standard TPZ is made, the opposite side of the tree shall increase the standard TPZ the same distance as the encroachment.
- d. Encroachment into the TPZ is prohibited in regard to trees that are leaning or have unbalanced canopies when warranted approval by the City and a finding that the tree should remain.

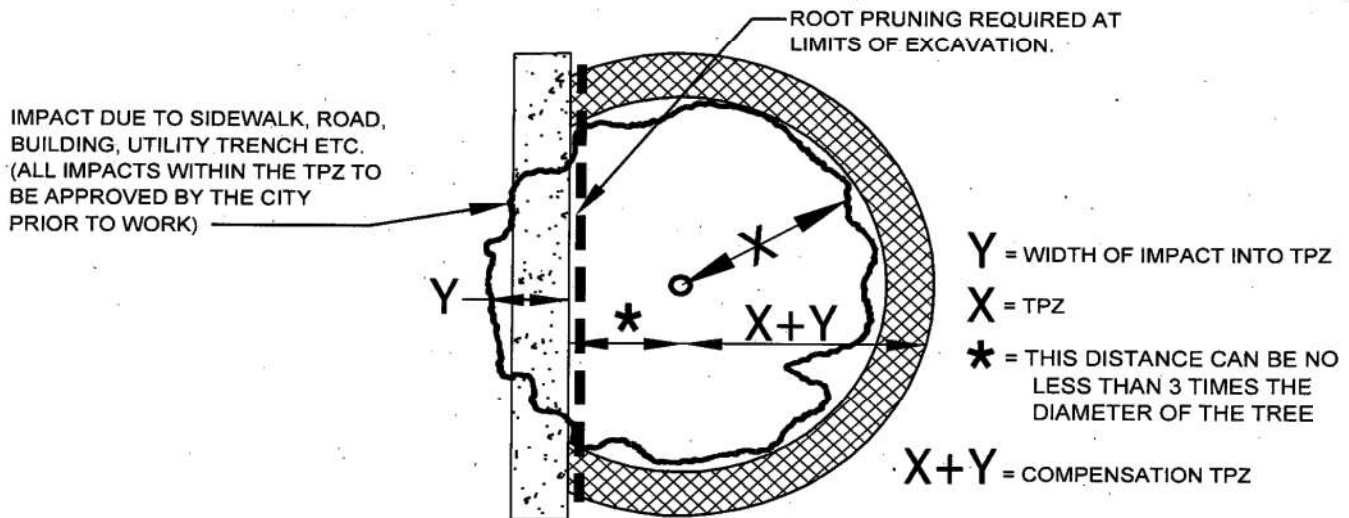
STANDARD TREE PROTECTION ZONE DETAIL

STANDARD TPZ



X EXAMPLE: A 36" DIAMETER TREE WOULD HAVE A RADIUS OF PROTECTION 36' OUT FROM THE CENTER OF THE TRUNK.

TPZ WITH COMPENSATION FOR UNAVOIDABLE ENCROACHMENTS



NOTES:

1. SEE PLANS FOR LOCATION OF TREE PROTECTION FENCES
2. ALL TREE PROTECTION FENCES MUST BE INSTALLED PRIOR TO CLEARING
3. NO GRADING SHALL OCCUR WITHIN THE TREE PROTECTION ZONE
4. REMOVE ALL BARRIERS UPON COMPLETION OF PROJECT
5. ANY VEGETATION REMOVED WITHIN THE TPZ SHALL ONLY BE DONE BY HAND

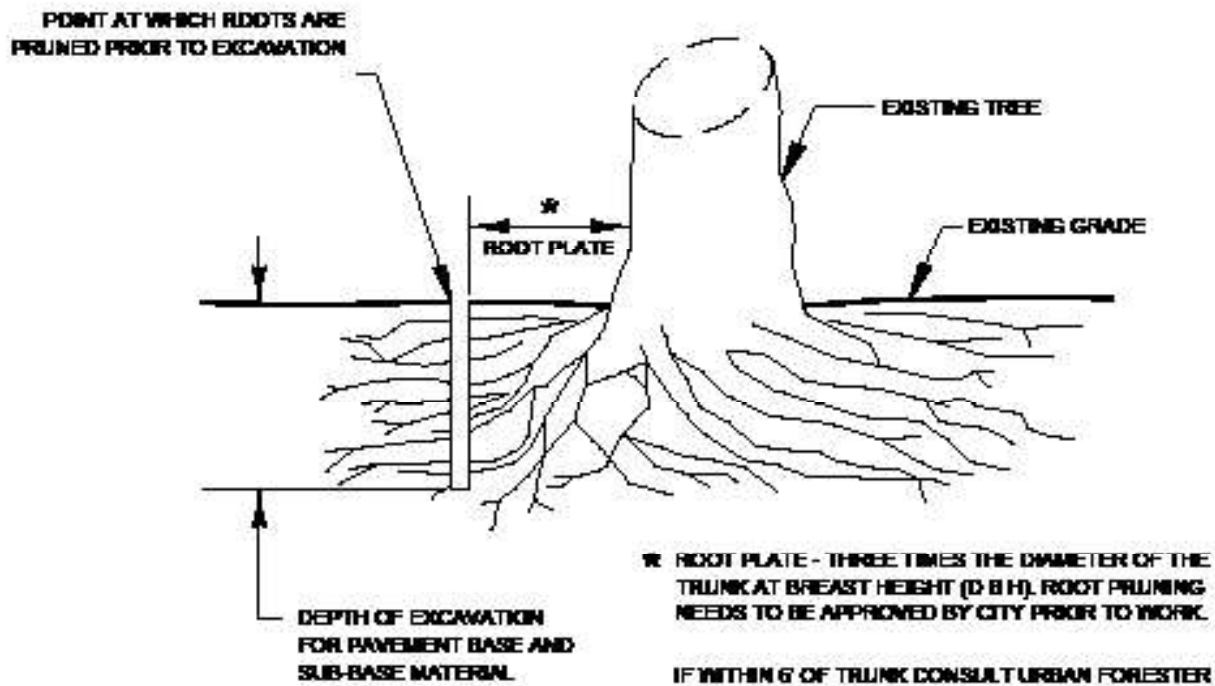
SCALE (N.T.S.)

2. Protective Activities Within the TPZ

Brush clearing and removal of any trees that will not be saved within the TPZ shall be done by hand or mechanized hand tools with the root system being left totally intact. In addition the following shall apply:

- a. Clearance pruning of branches of trees to be saved, as well as removal of damaged, diseased or dead branches can be accomplished prior to erection of the TPZ barricade fence if done according to ANSI A-300 Standards. Tree service or any other vehicles are preferred to be kept outside of the TPZ. If vehicular access must occur within the TPZ and there is no other physical way around it, a minimum depth of twelve (12) inches of hardwood mulch shall be placed on top of the root zone to cushion and distribute the load. After work is complete, remove mulch so that only three (3) to four (4) inches remain.
- b. Organic mulch should be applied on top of the soil within the TPZ at a depth of three (3) to four (4) inches. Excessive mulch over four (4) in depth can inhibit penetration of rainfall and irrigation to the roots.
- c. Root pruning at the outer edge of the TPZ is recommended to lessen construction impact to the trees in the TPZ. If work into the the TPZ is approved, root pruning shall be required.

ROOT PRUNING DETAIL



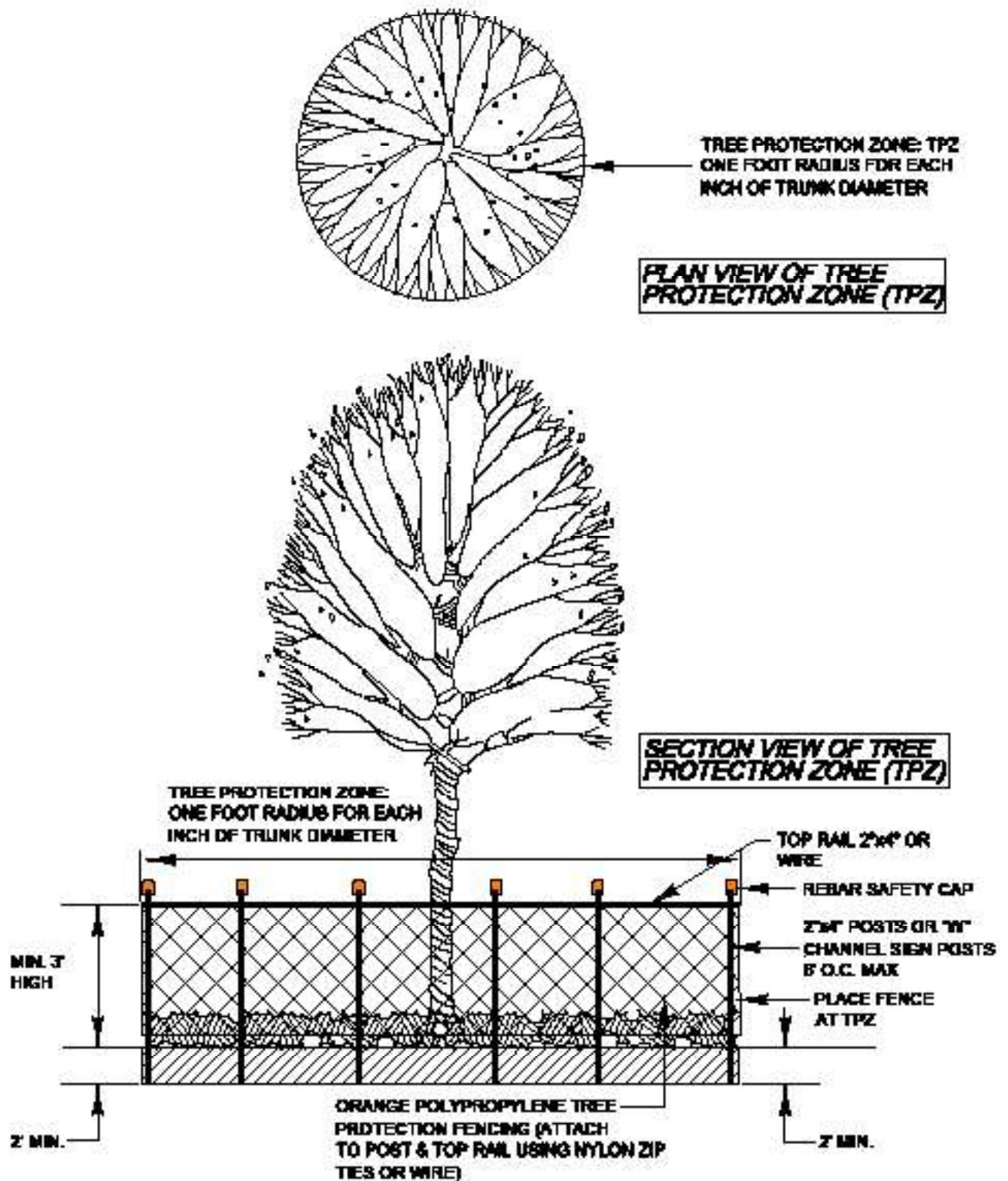
NOTES:

1. CUTS ARE TO BE MADE CLEANLY WITH A SHARP ROOT PRUNING TOOL (SUCH AS A DOSCO OR VERMEER ROOT PRUNER).
2. INSTALL ORANGE PLASTIC MESH TREE BARRIER, WITH REBAR SUPPORTS, AT POINT OF PRUNING AND CONTINUE COMPLETELY AROUND TREE, PROTECTING THE AREA WITHIN THE TREE PROTECTION ZONE.
3. ROOT PRUNING PROCEDURE MUST BE DONE AND INSPECTED AND APPROVED PRIOR TO ANY CLEARING OR GRADING OPERATIONS.

SCALE (N.T.S.)

- d. Trenching of utilities, irrigation pipes, etc. should be accomplished outside the TPZ. If pipes must be installed within the TPZ, root pruning or boring shall be done and the Urban Forester shall be made aware of the planned trenching or boring activities and given an opportunity to decide which method is the most appropriate.
 - e. Prohibited activities within the TPZ include, driving, parking, storing materials, dumping waste or paint, concrete washout, adding fill soil and soil excavation/grading.
3. **Tree Barricade and Protection Requirements**
- a. A sturdy wooden or metal fence shall be erected around all TPZ's on the construction site before any clearing or construction activities begin. The fence shall have two (2) x four (4) inch posts or "w" channel metal sign posts driven into the ground at the outside edge of the TPZ at eight (8) feet maximum spacing. A top rail or heavy gauge wire shall run along the top of the posts to support the flexible mesh fencing material.
 - b. The TPZ barricade fence shall remain standing until all construction activities have been completed. If the fence must be taken down for any reason, the City Urban Forester shall be advised of the activity and given an opportunity to be present when the fence is temporarily taken down. The fence shall be put back immediately after work is done.
 - c. TPZ barricade fences shall not be moved or allowed to collapse. It is the responsibility of the builder to maintain the TPZ fences in good condition. If the barricade is to be removed for any reason, the City shall be notified of the reason why and barricade shall not be removed until authorized to do so.

TREE PROTECTION FENCING DETAIL



NOTES:

1. SEE PLANS FOR LOCATION OF TREE PROTECTION FENCES
2. ALL TREE PROTECTION FENCES MUST BE INSTALLED PRIOR TO CLEARING
3. NO GRADING SHALL OCCUR WITHIN THE TREE PROTECTION ZONE
4. REMOVE ALL BARRIERS UPON COMPLETION OF PROJECT
5. ANY VEGETATION REMOVED WITHIN THE TPZ SHALL ONLY BE DONE BY HAND

SCALE (N.T.S.)

E. Replacement of Trees

When protected trees are removed from a development site, a certain percentage of these tree “inches” must be replaced in accordance with Table 11-2 of the LDC, which provides the number and size of replacement trees that must be planted throughout the development site. Tree Mitigation Worksheets and the submittal form have been provided in Appendix A of this manual. The following tables identify replacement trees and plants recommended by the City:

1. Recommended Replacement Canopy/Shade Trees

COMMON NAME	BOTANICAL NAME
Cypress	Taxodium spp.
Elm	Ulmus spp.
Hickory	C.galbra
Magnolia	Magnolia grandiflora
Florida Red Maple	Acer rubrum.
Shumard Oak	Quercus shumardii
Live Oak	Quercus virginiana
Red Bay	Persea borbonia
Red Cedar	Juniperus silicicola
Sweetgum	Liquidambar styraciflua
Sycamore	Platanus occidentalis
Turkey Oak	Quercus laevis
Date Palms*	Phoenix spp.
Sabal Palms* (groups of 3)	Sabal palmetto
River Birch	Betula nigra ‘Dura Heat’

* Due to existing site conditions or architectural themes, palms may be substituted for canopy/shade trees but shall comprise no more than fifty (50) percent of the tree requirement. Sabal palms shall be used in groups of three (3).

2. Recommended Replacement Understory Trees

COMMON NAME	BOTANICAL NAME
Palm Trees*	Butia capitata, Livistonia chinensis
Chickasaw Plum	Prunus angustifolia
Crape Myrtle	Lagerstroemia indica
Holly	Ilex (East Palatka, dahoon, eagleston, Savannah)
Indian Hawthorn (standard)	Raphiolepis indica-‘Majestic Beauty’
Japanese Blueberry	Elaeocarpus decipiens
Jerusalem Thorn	Parkinsonia aculeate
Redbud	Cercis Canadensis
Ligustrum	Ligustrum-lucidum, japonica
Loquat	Eriobotrya japonica
Magnolia	Magnolia grandiflora-‘Little Gem’, ‘Mgtig’
Scrub Oak	Quercus geminata
Viburnum (std.)	Viburnum spp.

* One (1) palm is needed to be a minimum of three (3) feet of clear trunk to qualify as an understory tree with no more than fifty (50) percent of the total tree requirement being palms.

3. Recommended Replacement Trees, Shrubs, & Groundcovers

These trees and plants are proven to be hardy and drought resistant, therefore, able to survive without supplemental irrigation after establishment. For more information on plants listed in this section may be found in the Waterwise Florida Landscapes from Florida’s water management districts. This list section may be amended from time to time by the Land Use Administrator. *Xeric plants

NATIVE TREES	BOTANICAL NAME	NON-NATIVE CULTIVATED TREE NAME	BOTANICAL NAME
Oak, live	Quercus virginiana	Crape Myrtle	Lagerstroemia indica
Oak, sand live	Quercus geminata	Bottlebrush	Callistemon rigidus
Oak, myrtle	Quercus myrtifolia	Jerusalem Thorn	Parkinsonia aculeata
East Palatka Holly	Ilex X attenuata	Loquat	Eriobotrya japonica
American Holly	Ilex opaca	Drake Elm	Ulmus parvifolia
Dahoon Holly	Ilex cassine		
Yaupon Holly	Ilex vomitoria		
Chicksaw Plum	Prunus angustifolia		
Southern Red Cedar	Juniperus silicicola		
Magnolia	Magnolia grandiflora		
River Birch	Betula nigra		

NATIVE SHRUBS	BOTANICAL NAME	NON-NATIVE CULTIVATED SHRUB	BOTANICAL NAME
Blueberry, shiny	Vaccinium myrsinites	Century plant	Agave americana
American beautyberry	Callicarpa americana	Azalea hybrids	Rhododendron spp.
Florida flame Azalea	Rhododendron austrinum	Camellia, sasanqua	Camellia sasanqua
Fakahatchee grass	Tripsacum dactyloides	Chaste-tree	Vitex agnus-castus
Coontie	Zamia floridana	Eleagnus (Silverthorn)	Elaeagnus pungens
Hydrangea, oakleaf	Hydrangea quercifolia	Chinese Juniper	Juniperus chinensis
Sparkleberry	Vaccinium arboreum	Viburnums	Viburnum spp.
Sweet shrub	Calycanthus floridus	Indian Hawthorn	Raphiolepis indica
Fetterbush	Leucothoe racemosa	Gardenia	Gardenia augusta
Gallberry	Ilex glabra	Cornuta Hollies	Ilex cornuta
Florida Anise	Illicium floridanum	Pittosporum	Pittosporum tobira
Prickly Pear Cactus	Opuntia sp.	Rosemary	Rosmarinus officinalis
St. John's Wort	Hypericum reductum	Texas Sage	Leucophyllum frutescens
Yaupon Holly	Ilex vomitoria	Boxthorn	Severinia buxifolia
Yellow Necklace Pod	Sophora tomentosa		
Wax Myrtle (may not be used as credit for a tree)	Myrica cerifera		
Rusty Lyonia	Lyonia ferruginea	Pineapple Guava	Feijoa sellowiana
Sweetspire	Itea virginica	Plumbago	Plumbago auriculata

NATIVE	BOTANICAL NAME	CULTIVATED	BOTANICAL NAME
Cross Vine	Bignonia carpeolata	Creeping Fig	Ficus pumila
Grape Vine	Vitis spp.	Confederate Jasmine	Trachelospermum jasminoides
Yellow Carolina Jasmine	Gelsemium sempervirens	English Ivy	Hedera helix
Coral Honeysuckle	Lonicera sempervirens		
Morning Glory	Ipomoea spp.		
Virginia Creeper	Parthenocissus quinquefolia		
Trumpet Vine	Campsis radicans		

NATIVE GROUNDCOVERS BOTANICAL NAME		NON-NATIVE CULTIVATED NAME	BOTANICAL NAME
Adam's Needle	<i>Yucca filamentosa</i>	Aloe	<i>Aloe barbadensis</i>
Beach Morning Glory	<i>Ipomoea imperati</i>	Cast-iron Plant	<i>Aspidistra elatior</i>
Cinnamon Fern	<i>Osmunda cinnamomea</i>	Algerian Ivy	<i>Hedera canariensis</i>
Muhly Grass	<i>Muhlenbergia capillaris</i>	Creeping Fig	<i>Ficus pumila</i>
Purple Love Grass	<i>Eragrostis spectabilis</i>	Mondo Grass	<i>Ophiopogon japonicus</i>
Sand Cord Grass	<i>Spartina bakeri</i>	Ground Cover Rose	<i>Rosa</i> x 'Red Carpet'
Smooth Cord Grass	<i>Spartina alterniflora</i>	Asiatic Jasmine	<i>Trachelospermum asiaticum</i>
Wire Grass	<i>Aristida beyrichiana</i>	Parsons Juniper	<i>Juniperus chinensis</i> 'Parsonii'
Carolina Jessamine	<i>Gelsemium sempervirens</i>	Shore Juniper	<i>Juniperus conferta</i>
Powderpuff	<i>Mimosa strigillosa</i>	Gold Mound	<i>Lantana camara</i> 'Gold Mound'
Porterweed	<i>Stachytarpheta jamaicensis</i>	Liriope	<i>Liriope</i> spp.
Railroad Vine	<i>Ipomoea pes-caprae</i>	Purple Queen	<i>Tradescantia pallida</i>
Sea Purslane	<i>Sesuvium portulacastrum</i>	Vinca	<i>Vinca</i> spp.
Beach Sunflower	<i>Helianthus debilis</i>	Thyme	<i>Thymus vulgaris</i>
Muhly Grass	<i>Muhlenbergia capillaris</i>	Perennial Peanut	<i>Arachis glabrata</i>

NATIVE PALMS/CYCADS	BOTANICAL NAME	CULTIVATED	BOTANICAL NAME
Sabal Palm	<i>Sabal palmetto</i>	Pindo Palm	<i>Butia capitata</i>
Saw Palmetto	<i>Serenoa repens</i>	Canary Island Date Palm	<i>Phoenix canariensis</i>
Coontie Fern	<i>Zamia floridana</i>	Chinese Fan Palm	<i>Livistona chinensis</i>
		Lady Palm	<i>Rhapis excelsa</i>
		King Sago	<i>Cycas revoluta</i>

4. Salt Tolerant Trees, Shrubs, and Groundcovers. For a listing of these types of plants and trees, go to the University of Florida website (<http://edis.ifas.ufl.edu>) and do a search for Dr. Black's "Salt Tolerance of Landscape Plants for Florida" publication.

F. Tree Bank Fund

1. Allowable Sites

If the applicant demonstrates to the City that the site cannot accommodate the total number of required replacement trees because of insufficient planting area, the applicant shall provide a monetary contribution to the Tree Bank Fund or may plant the tree(s) off-site. If planting occurs at an off-site location, the following criteria shall be followed:

- a. Planting and establishing the required replacement tree(s) at a site within the City and approved by the City as long as the site where the mitigation is required does not fall below the minimum required planting densities.
- b. The alternative site must be located in the City. Applicants are encouraged to coordinate with and seek input from the City in selecting alternative sites for tree mitigation. A location in the proximity of the applicant's property is preferred
- c. The alternative site must be owned or leased by the applicant, or by a governmental entity that has authorized the installation of the trees, or is privately owned and the owner has consented to the use of his property as an alternative site; provided, however, that governmental entities providing off-site mitigation may do so only on property owned or leased by a governmental entity.
- d. The installation of the trees at the alternative site will provide aesthetic benefits to many of the same citizens which would have benefited from the installation of the landscaping on the applicant's property.
- e. The alternative site is determined by the City to be a location where the trees are likely to survive.
- f. If the applicant elects to install the required trees at the alternative site, the applicant shall submit plans for the alternative site for review and approval by the City. Any trees planted at the alternative site pursuant to this Section shall be in addition to, and not in lieu of, the requirements of this Article unless the site is an existing non-conforming site.

2. Tree Bank Fund Payment Amounts

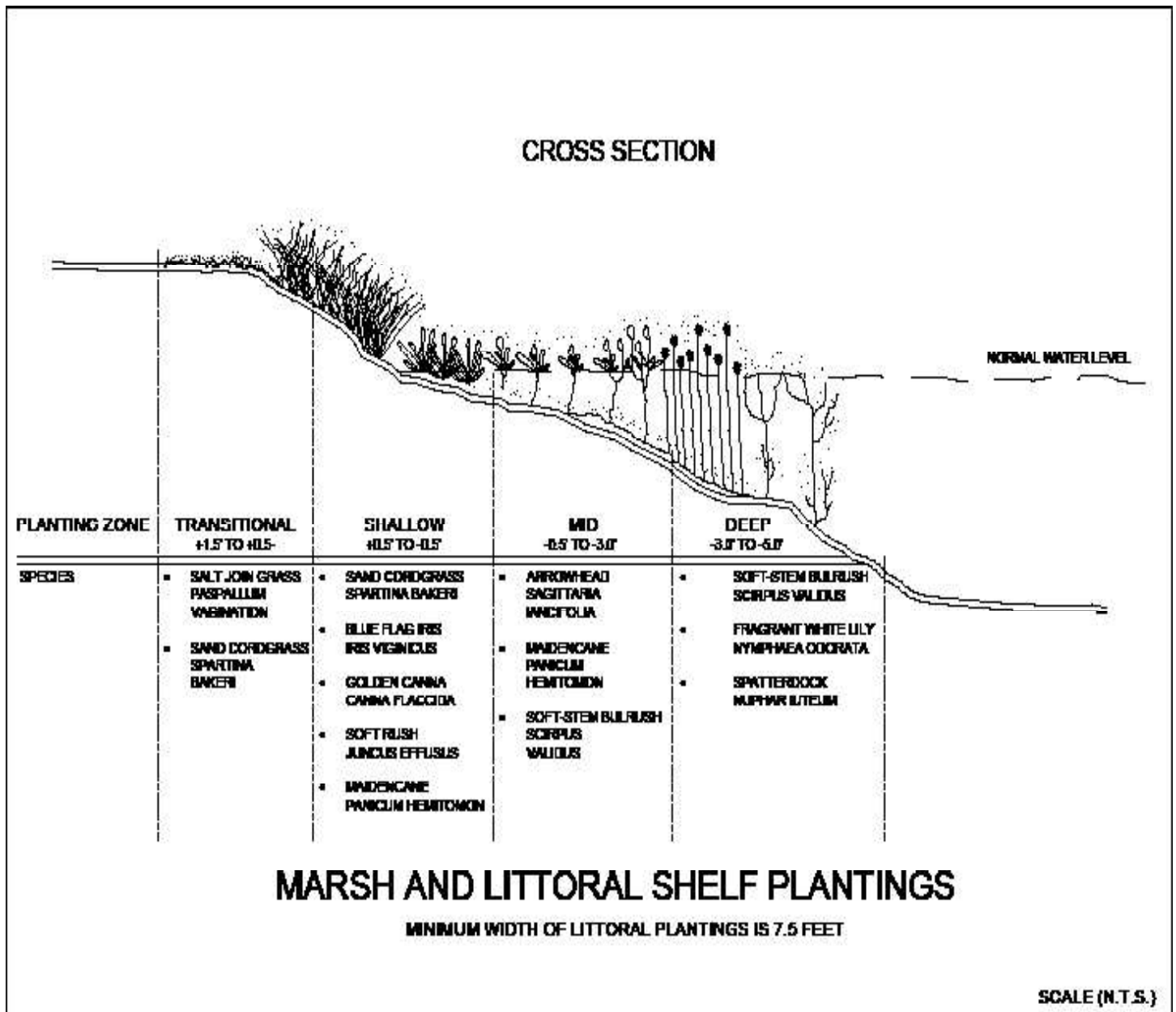
Funds paid to the Tree Bank Fund Account held by the City are used exclusively for the following types of expenditures:

- a. Labor to plant, stake and mulch.
- b. Cost of tree and materials to stake and mulch.
- c. Tree re-location onto public lands.
- d. Design and installation of irrigation systems to water the new or relocated trees.
- e. Delivery costs of trees
- f. Hand watering of trees to establish.

Determination of tree costs (including installation, staking, and mulching) is achieved by an annual cost of survey of tree prices from local landscape contracting firms. At least three firms shall be contacted for quotes and averaged out to determine the final cost equivalents.

IV. GENERAL LANDSCAPING REQUIREMENTS

- A. Planting Bed Requirements. See examples in Section V of this manual.
- B. Detention Ponds (normally wet stormwater ponds)



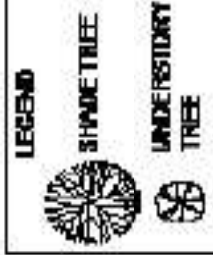
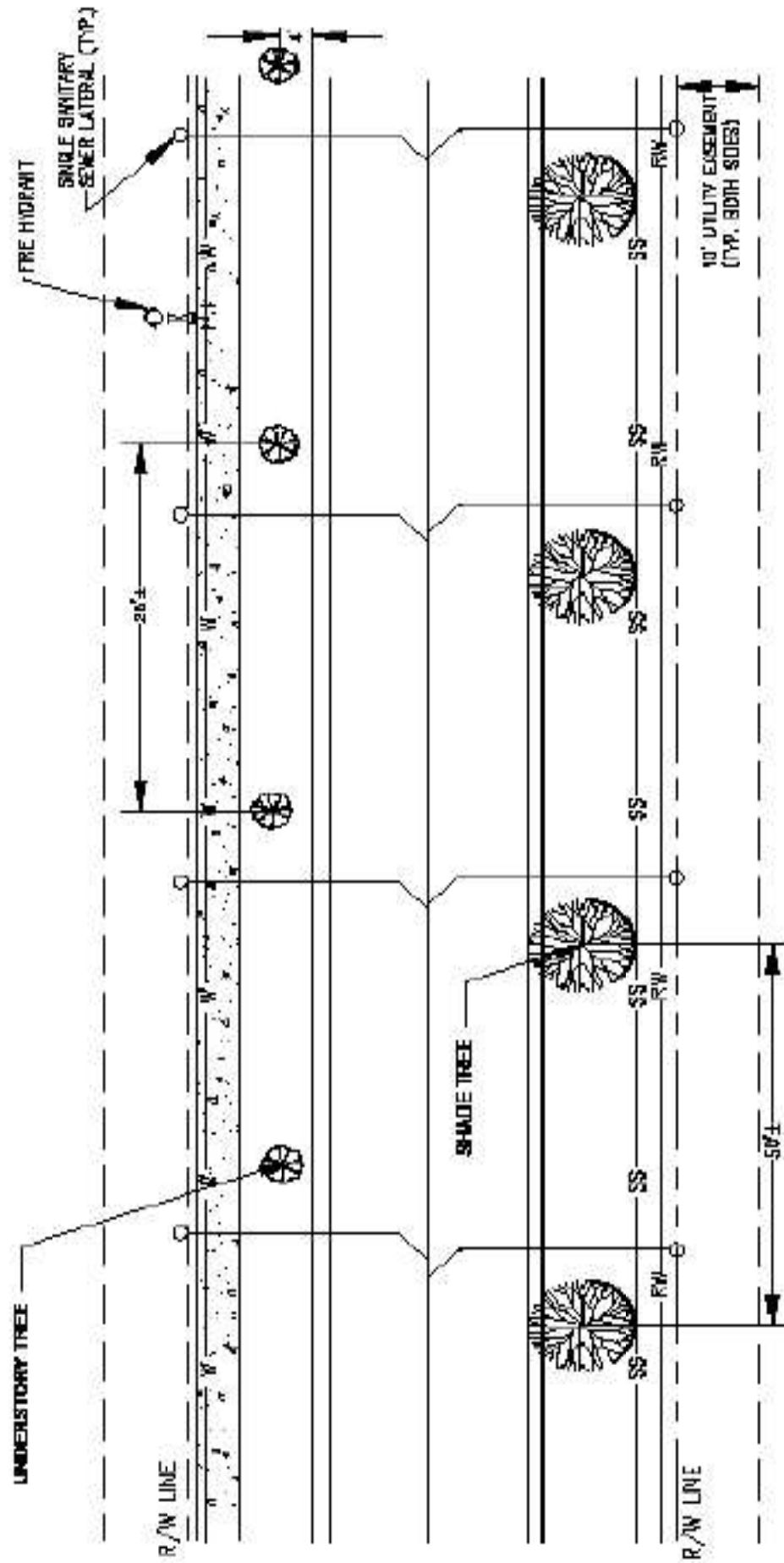
C. Street Trees and Median Plantings

1. Street Tree Standards

- a. In no case shall one (1) species comprise more than forty (40) percent of the tree plantings. Unless otherwise allowed by the City, all street trees shall be shade trees.
- b. For Residential, SPX/DPX Developments see Landscape Development Code section 11.03.02.D.1.b
- c. Spacing shall be fifty (50) feet on center, but not more than seventy (70) feet if driveways or utilities are a constraining factor.

STREET TREE PLANTING DETAIL

(MTRICOM, IND, STRIPX AND SUB DEVELOPMENTS ADJACENT TO COMMON AREAS)



NOTE:

1. IF BOTH REUSE AND FORCE MAIN EXIST THEN SHADE TREE SHALL BE AN UNDERSTORY TREE OR PALM.
2. SHADE TREES CAN BE PLANTED NO CLOSER THAN 8 TO 10 FEET FROM WATER OR SEWER LINES.
3. UNDERSTORY TREES CAN BE PLANTED NO CLOSER THAN 5 TO 8 FEET FROM WATER OR SEWER LINES.
4. TREE SIZE TO BE 3 1/2" CAL PER 65 GALLON CONTAINER OR EQUIVALENT BULB SIZE.

DETAIL N.T.S.

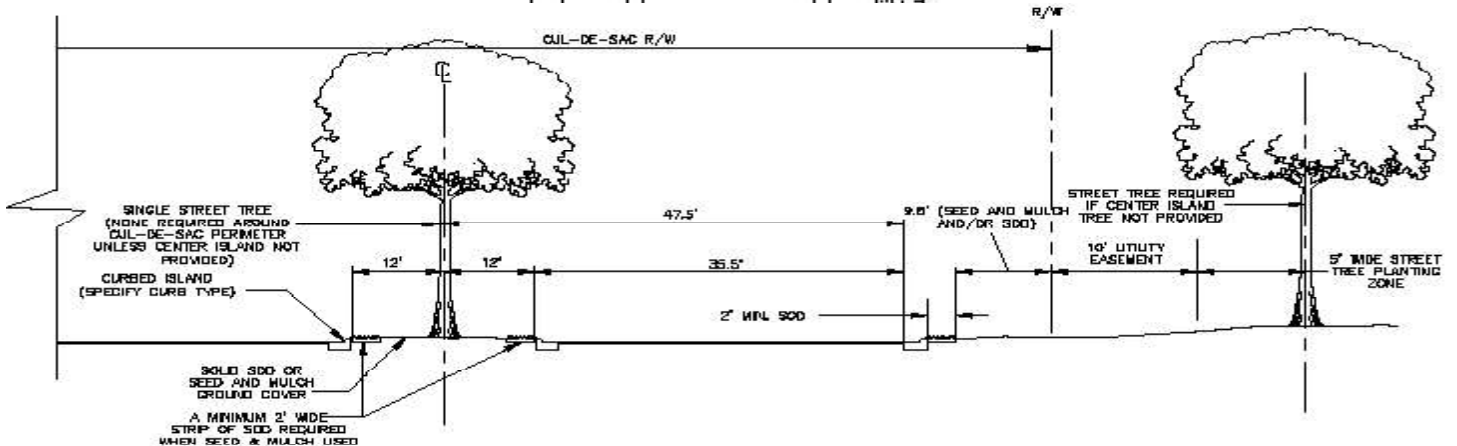
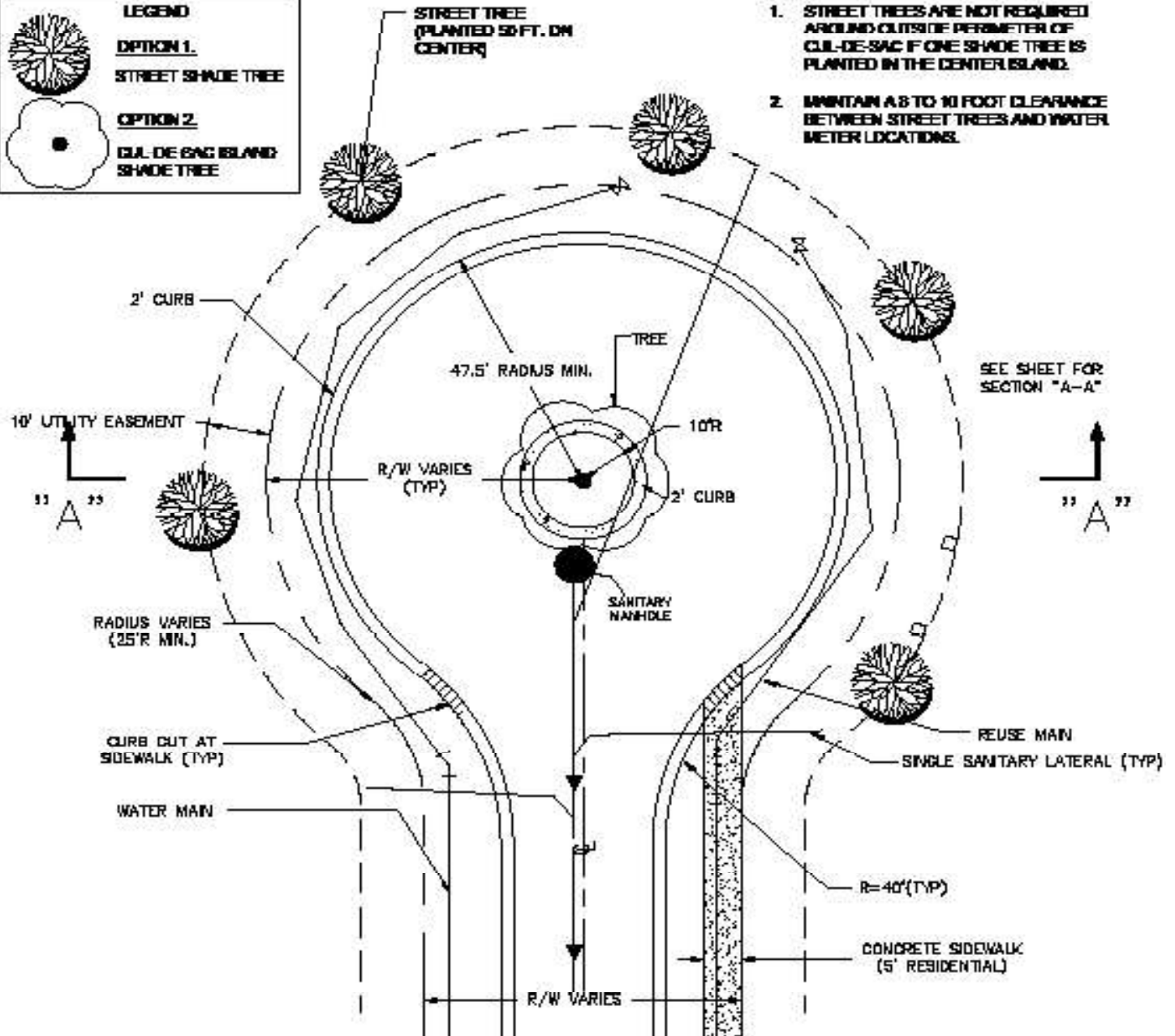
STREET TREE PLANTING DETAIL

(MFR/COM, IND, SFR/DPX AND SUBD DEVELOPMENTS ADJACENT TO COMMON AREAS)



NOTES

1. STREET TREES ARE NOT REQUIRED AROUND OUTSIDE PERIMETER OF CUL-DE-SAC IF ONE SHADE TREE IS PLANTED IN THE CENTER ISLAND.
2. MAINTAIN A 8 TO 10 FOOT CLEARANCE BETWEEN STREET TREES AND WATER METER LOCATIONS.



SECTION "A-A"

- d. For common areas along streets in residential subdivisions (SFR/DPX), the size of the street trees shall be two (2) inches caliper. For nonresidential subdivisions MFR/COM, IND and SUBD, the trees shall be three and one-half (3-½) inches caliper and 8' clear trunk.
 - e. Where medians are present and shade trees are planted at a maximum spacing of thirty (30) feet on center, the requirement for planting street trees in the right-of-way on both sides of the road can be waived by the City.
 - f. A typical cross-section of the road right-of-way showing the location of the street trees in relation to all utilities shall be provided. Street trees shall be planted at the time of subdivision infrastructure construction along all common areas where no lots exist. If street trees must be planted outside of the right-of-way line or utility easement, trees must not be farther than 10' outside of the right-of-way.
2. **Medians.** Trees or other shrubbery planting (including boulders, concrete domes, etc.) shall not be permitted within the rights-of-way unless previously permitted or approved as part of an approved subdivision plan by the City, or through the City's 'Adopt-A-Median' program.

D. Planting Procedures / Soil Improvement Standards

1. **Standards for Planting, Fertilizing, Watering, and Soil Improvement**
 - a. **Planting Standards.** Watering, planting, and fertilizing of all trees and shrubs shall be based on ANSI-300 Best Management Practices- Planting. This document can be ordered from the International Society of Arboriculture website at www.isa-arbor.com.
 - b. **Soil Improvement.** Structural Soil Specifications shall be employed in the construction plans for tree cut out areas in sidewalks or parking lots where there is not at least 300 square feet of area for a shade tree or 150 square feet of area for palms or understory trees. Sheet 1 and Sheet 2 Details and Specifications must be included on the submitted Landscape Plans.
 - c. **Limerock.** Limerock shall be removed from all planting beds prior to filling with soil and planting. This is particularly important for parking lot islands.

E. Seeding Specifications

1. **Applicability.** Where areas are disturbed by construction and not subject to erosion, they shall be, at a minimum, seeded and mulched with appropriate seed mixes for the particular time of the year the seeding will take place.
2. **Specifications.** See Appendix B of this manual.

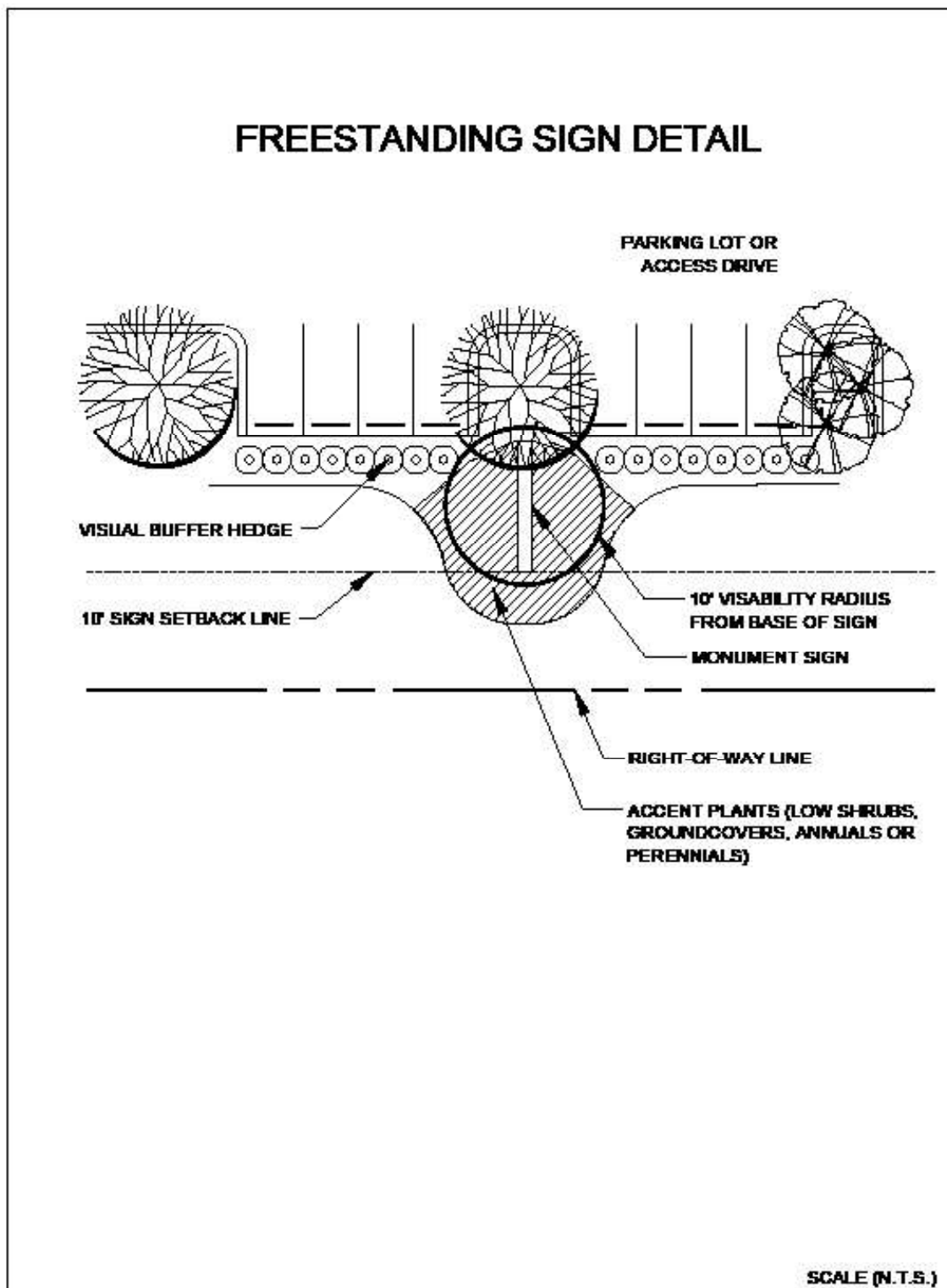
F. Wildfire Hazard Assessment

1. **Applicability.** Trees and plantings are recommended to conform to the following requirements if the development is located in a medium or higher fire hazard-rating category as determined by the wildfire hazard assessment required in subsection 11.03.02 of the LDC.
 - a. **Tree Thinning.** Pine tree canopies should be thinned by removal of the trees so there is no more than seventy-five (75) crown closure in any given area, except wetlands. There shall be no mitigation required for these trees. Land clearing or excavation of stumps is not allowed under this provision.
 - b. **Prescribed Burn.** Prior to development of any lots within the subdivision, a prescribed burn should be implemented. If this is not possible due to weather conditions, smoke limitations, or other constraints beyond the owner's control, then other means of fuel mitigation strategies such as herbicide spraying, brush mowing, tree thinning, disking, or chopping should be utilized over the entire site exclusive of wetlands and their associated buffers.
 - c. **Educational Literature.** The owner of a subdivision or homeowner's association is encouraged to provide new lot purchasers and their developers with educational literature informing them that they are in an area at risk for wildfires. This literature shall include, but is not limited to, an evacuation plan, fire resistant building materials and landscaping plants and recommendations for providing a minimum of thirty (30) feet or more of defensible space around structures. This information is available from the City's Fire Department and www.firewise.org. For further information, please see the booklet entitled, "Wildfire Hazard Assessment Guide for Florida Homeowners", published by the Division of Forestry, September 2002, available at www.itm-info.com/lotefl/images/homeguide.pdf.
 - d. **Provision for Greenbelts.** Where possible, stormwater retention facilities and recreation/athletic fields or other common areas shall be located around the perimeter of the site in order to provide a wider greenbelt of open land, thereby creating more defensible space.
 - e. **Wildfire Protection Zone.** A minimum of fifty (50) feet in width shall be placed along all perimeter boundaries of the planned development or subdivision and designated as a wildfire protection zone. Within this buffer area, the following provisions are recommended:
 - (1) Shade trees planted within residential lots abutting a wildfire protection zone shall be spaced a minimum of fifty (50) feet from one another. Foundation shrubs shall be planted a minimum distance of twenty-four (24) inches for dwarf shrub / groundcovers and thirty-six (36) inches for shrubs from the building wall to center of plant. Shrubs shall be spaced a sufficient distance apart such that they will not grow into a solid hedge, but have a one (1) to two (2) foot gaps between them.

- (2) Plants and trees within this buffer should not be species that contain volatile oils that are extremely combustible such as wax myrtle, cedar, juniper, gallberry and saw palmetto. Refer to www.firewise.org for more information on the types of plants that burn more readily.

G. Freestanding Sign Landscaping

Where possible, signage shall be shifted within the buffer to allow the required room for screen plantings between the sign and the outside parking envelope area. When this is not possible, the below drawing illustrates a ten (10) foot radius from the sign base where lower growing plants are allowed.

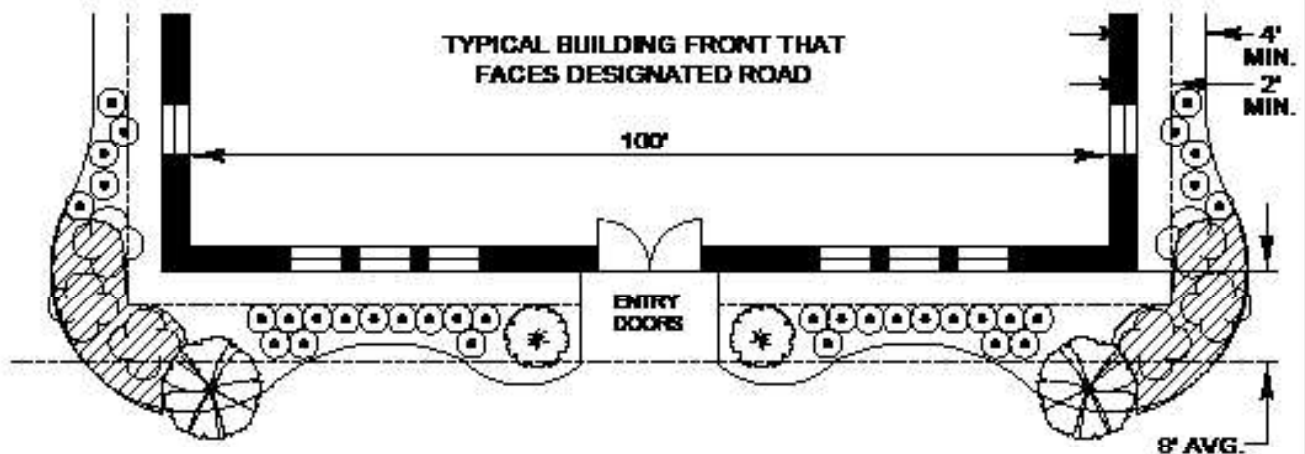


V. FOUNDATION PLANTING REQUIREMENTS

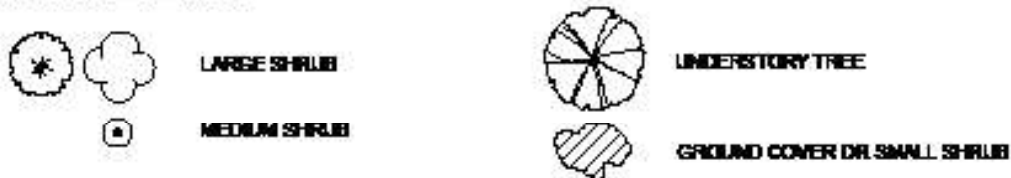
A. MFR/COM and IND Developments

TYPICAL MFR / COM / IND FOUNDATION PLANTING

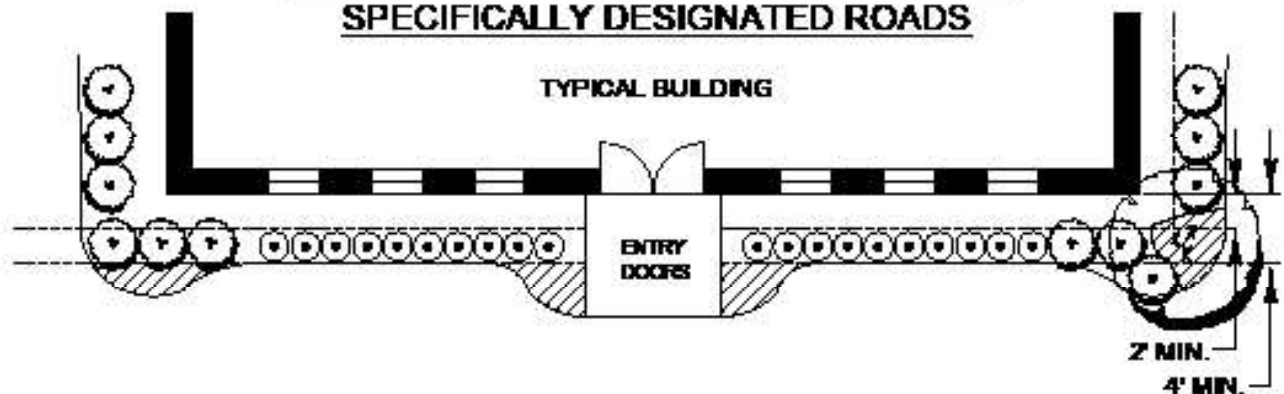
FOR SPECIFICALLY DESIGNATED ROADS: BELLE TERRE PARKWAY,
 BELLE TERRE BLVD., COLBERT LANE (SEGMENT NORTH OF PALM COAST PARKWAY), I-85,
 MATANZAS WOODS PARKWAY, OLD KINGS RD, PALM COAST PARKWAY (SEGMENT WEST OF I-85),
 PALM HARBOR PARKWAY (SEGMENT NORTH OF HAMMOCK DUNES BRIDGE), PINE LAKES PARKWAY,
 ROYAL PALMS PARKWAY, S.R. 100, SEMINOLE WOODS PARKWAY, US 1 AND WHITE VIEW PARKWAY.



PLANTING BEDS WITH A MINIMUM OF 4 FEET SHALL SURROUND A MINIMUM OF 70 PERCENT OF THE BUILDING ELEVATION EXCLUDING AREAS ADJACENT TO ENTRY DOORS, FOUNTAINS, BENCHES AND SCULPTURES. TWO DIFFERENT HEIGHTS OF PLANT MATERIAL AND ONE UNDERSTORY TREE FOR EVERY 50 LINEAL FEET OF BUILDING WALL LENGTH.



ALL OTHER BUILDINGS NOT LOCATED ON SPECIFICALLY DESIGNATED ROADS



A 4' WIDE MINIMUM PLANTING BED IS REQUIRED WITH SHRUBBERY NO CLOSER THAN 2' FROM THE BUILDINGS. TWO DIFFERENT HEIGHTS OF PLANT MATERIAL IS REQUIRED TO SOFTEN BLANK WALLS.

SCALE (N.T.S.)



Good example of perimeter buffer on special arterial or collector roads showing effective use of lower accent plants in front of the taller parking lot visual buffer shrubs.



Example of Dumpster or Mechanical Equipment.



Good example of COM Development foundation plantings showing plants and trees of varying heights to accent and soften building architecture.



Good example Type C Buffer showing good use of accent palms, taller foundation planting on columns and monument sign.



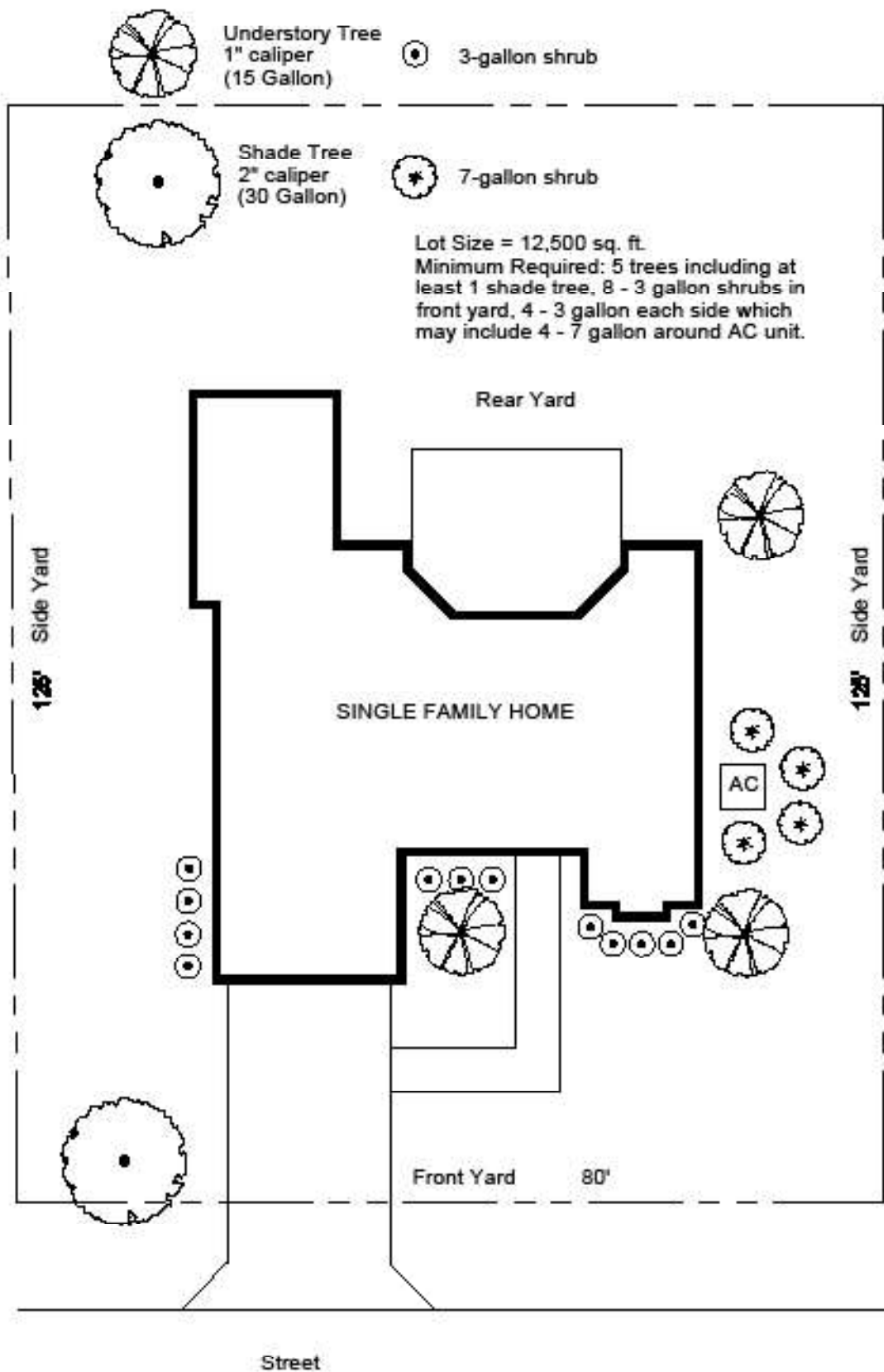
Monument Sign Landscaping.



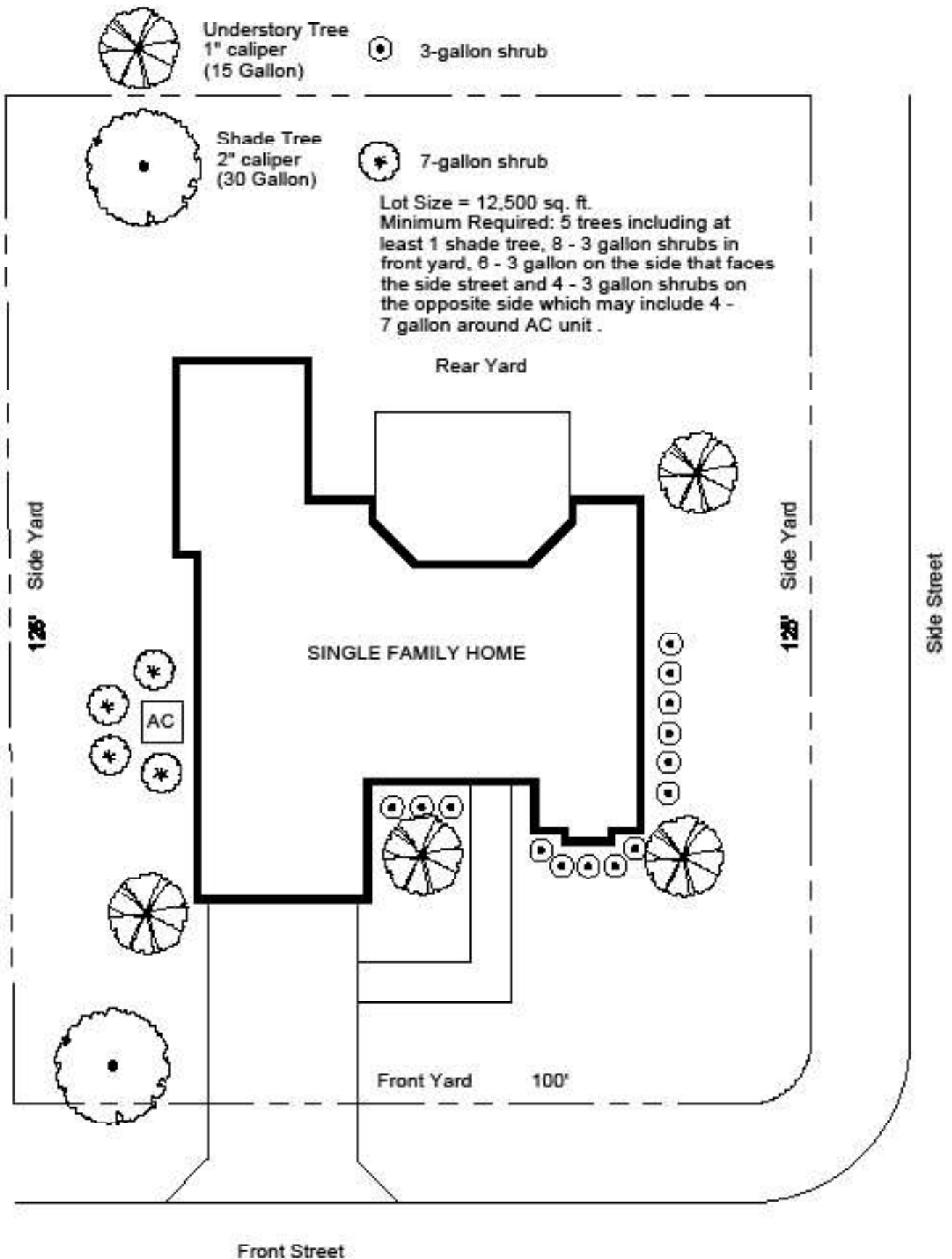
Architectural Trellis used as Foundation Planting.

B. SFR/DPX Developments
SFR/DPX Typical Foundation Planting Plan

INTERIOR LOT MINIMUM LANDSCAPING



CORNER LOT MINIMUM LANDSCAPING





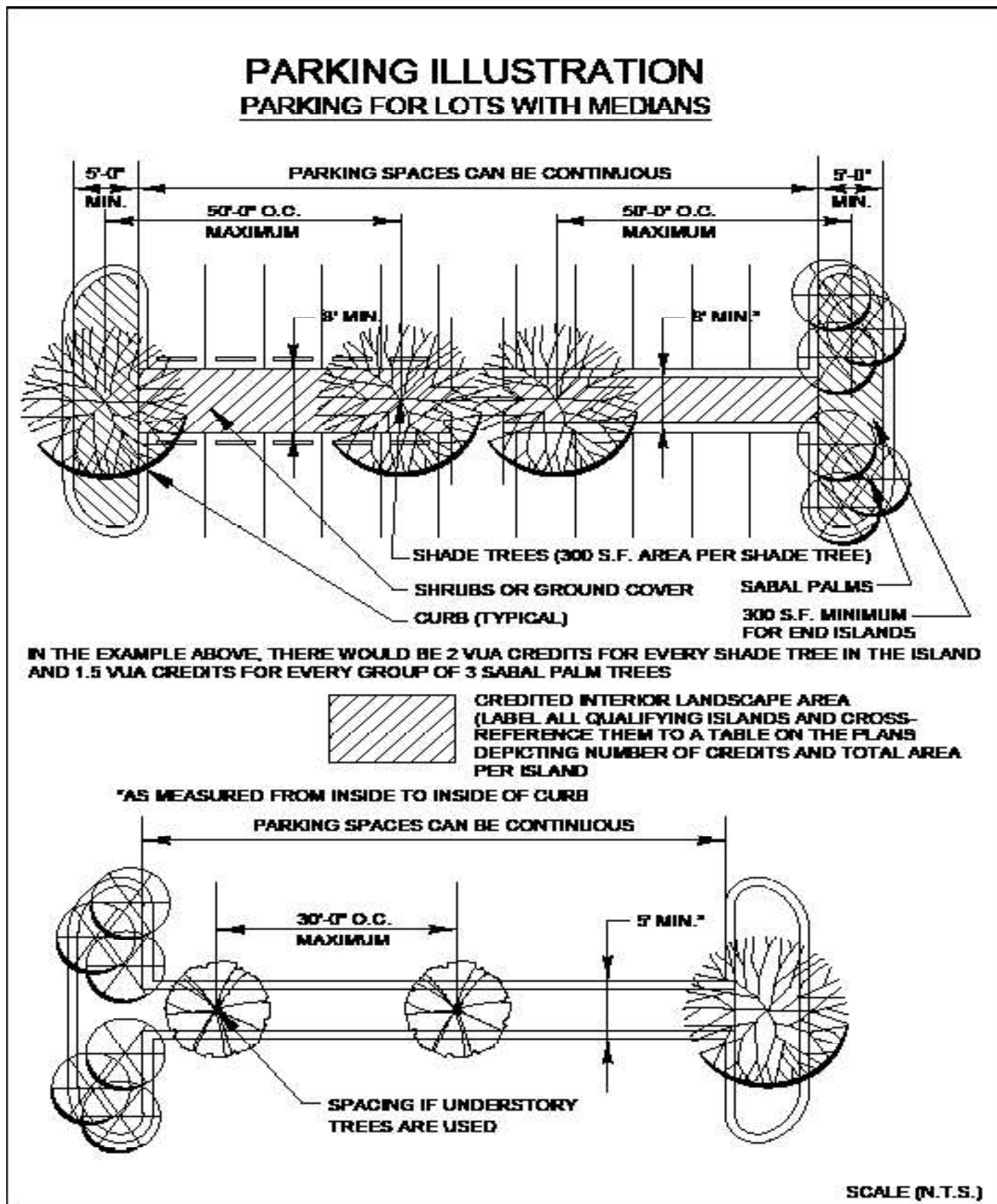
Tropical Plants are not allowed due to temperature constraints.



Example of Mechanical Equipment Screening.

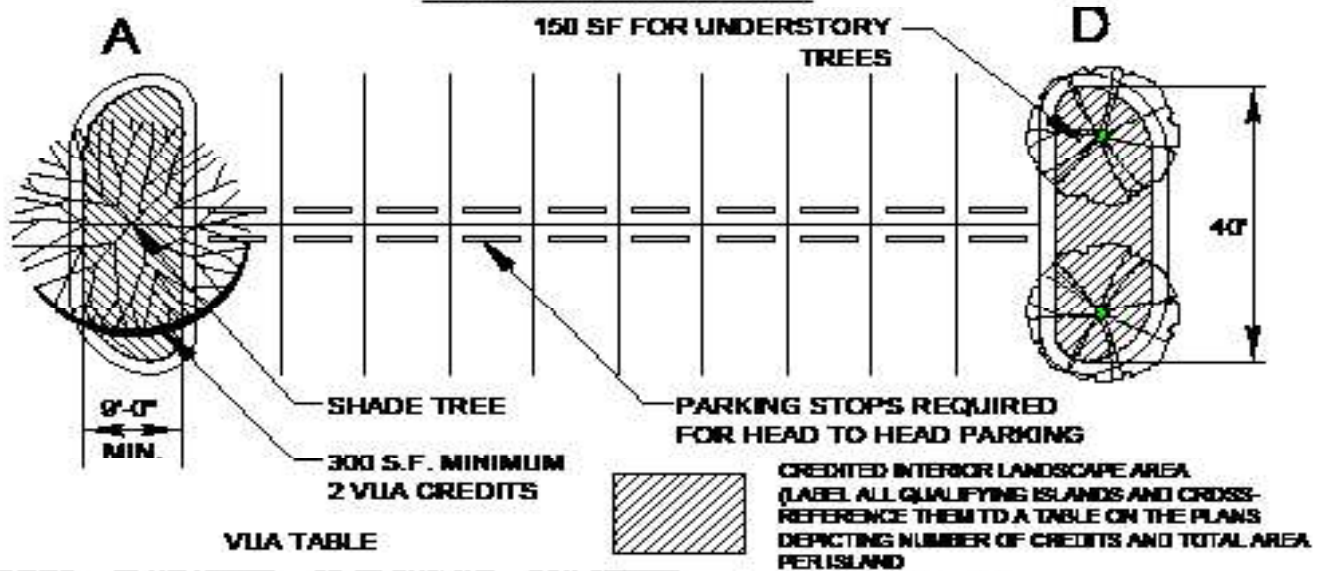
VI. PARKING LOT LANDSCAPING REQUIREMENTS

A. Internal Parking Lot Landscaping



B. VUA Calculations and Tree Credits

PARKING ILLUSTRATION VUA CALCULATIONS



VUA TABLE

TREE TYPE	ISLAND LETTER	SQ. FT. IN ISLAND	#VUA CREDITS
SHADE	A	300 S.F.	2
SHADE	B	300 S.F.	2
UNDERSTORY	D	300 S.F.	2
PALM	C	150 S.F.	1.5
TOTAL			7.5

EXAMPLE

VUA = 25,000 S.F.

REQ. VUA = 2,500 S.F.

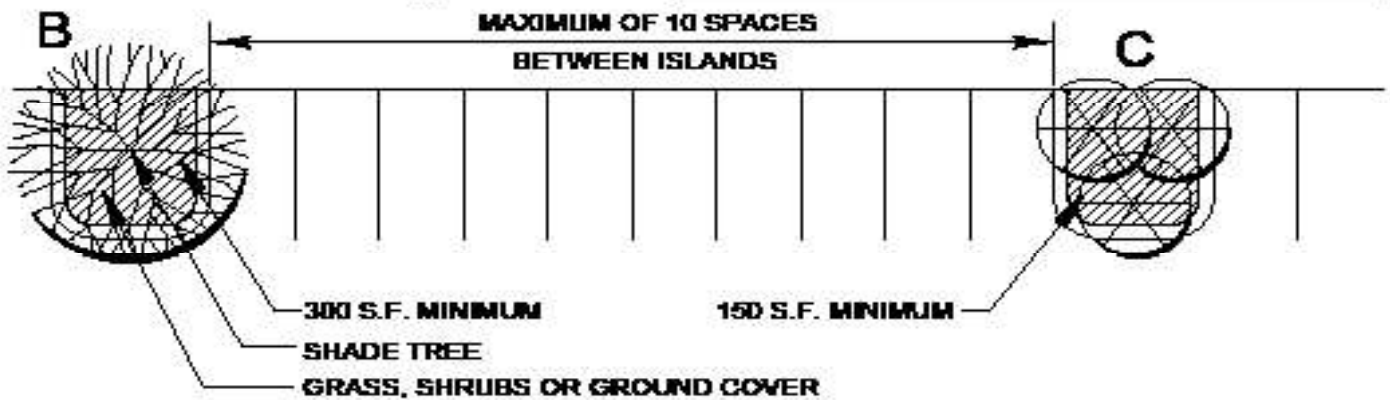
$2,500 \text{ S.F.} / 165 = 15.15 \text{ VUA CREDITS REQ.}$
(ROUNDED TO 15 VUA CREDITS)

ONE SHADE TREE IN A 300 SQ. FT. ISLAND = 2.0 VUA CREDITS

PARKING ILLUSTRATION TREE CREDITS

NOTE:

10% OF VEHICULAR USE AREA (VUA) NEEDS TO BE PROVIDED AS INTERNAL PARKING LOT LANDSCAPING AREA. LANDSCAPE ISLANDS SHALL HAVE AT LEAST ONE TREE CREDIT FOR EVERY ONE HUNDRED SIXTY-FIVE (165) SQUARE FEET OF REQUIRED INTERNAL PARKING LOT LANDSCAPE AREAS; WITH UNDERSTORY TREES RECEIVING ONE (1) TREE CREDIT, CLUSTERS OF THREE (3) PALM TREES RECEIVING ONE AND ONE-HALF (1 1/2) TREE CREDITS, AND SHADE TREES RECEIVING TWO (2) TREE CREDITS.



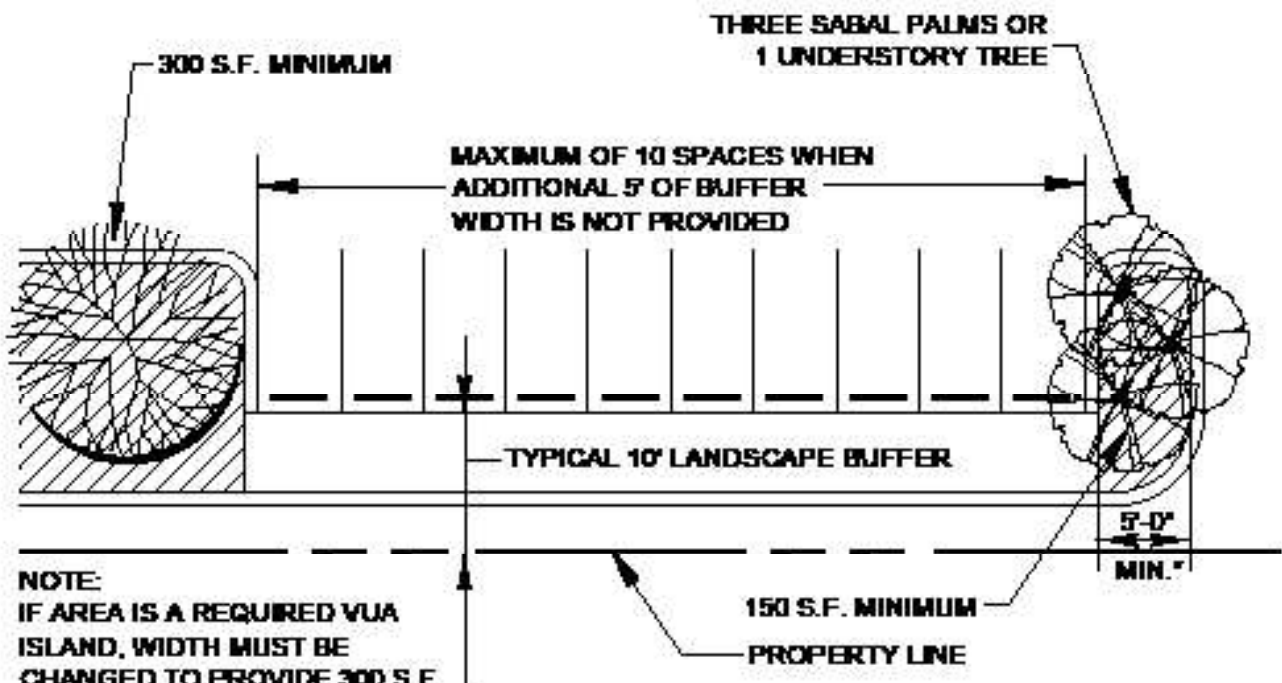
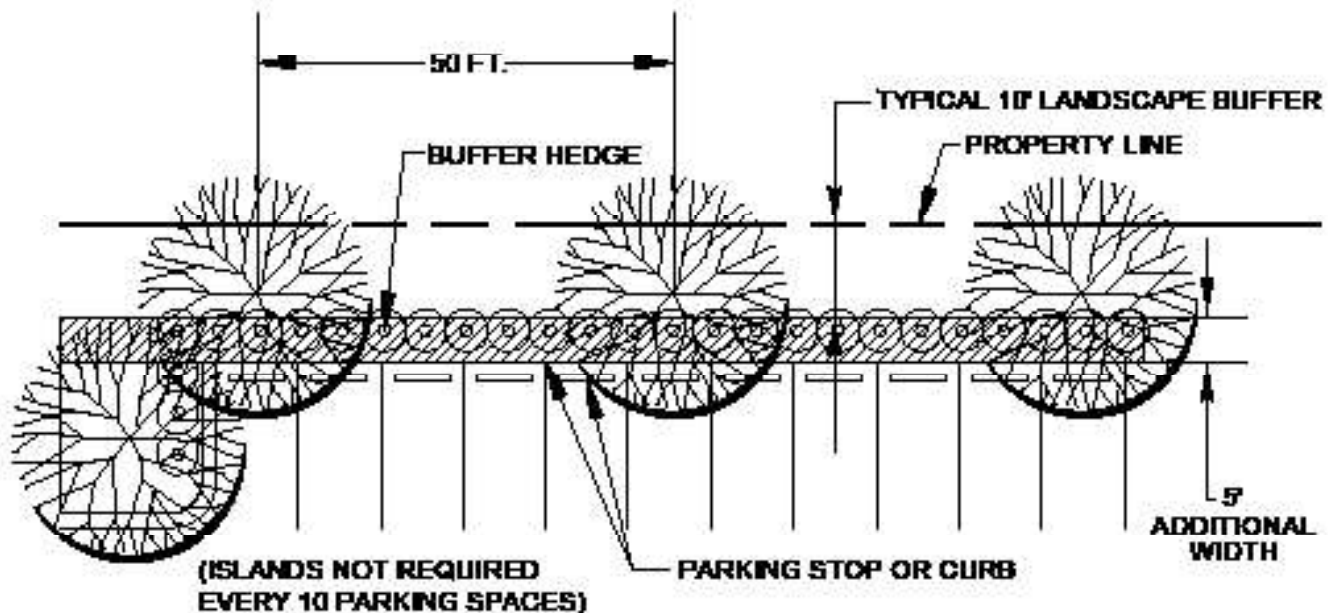
ONE SHADE TREE IN A 300 SQ. FT. ISLAND = 2.0 VUA CREDITS

THREE SABAL PALMS IN A 150 SQ. FT. ISLAND = 1.5 VUA CREDITS

SCALE (N.T.S.)

PARKING ILLUSTRATION

FLEXIBILITY TO ALLOW CONTINUOUS PARKING SPACES



NOTE:
IF AREA IS A REQUIRED VUA ISLAND, WIDTH MUST BE CHANGED TO PROVIDE 300 S.F. OF LANDSCAPE AREA FOR SHADE TREES AND 150 S.F. FOR UNDERSTORY TREES OR PALMS.



CREDITED INTERIOR LANDSCAPE AREA
(LABEL ALL QUALIFYING ISLANDS AND CROSS-REFERENCE THEM TO A TABLE ON THE PLANS DEPICTING NUMBER OF CREDITS AND TOTAL AREA PER ISLAND)

SCALE (N.T.S.)



One Shade Tree used as 2.0 VUA Credits (Top)
Three Sabal Palms used as 1.5 VUA Credits (bottom)

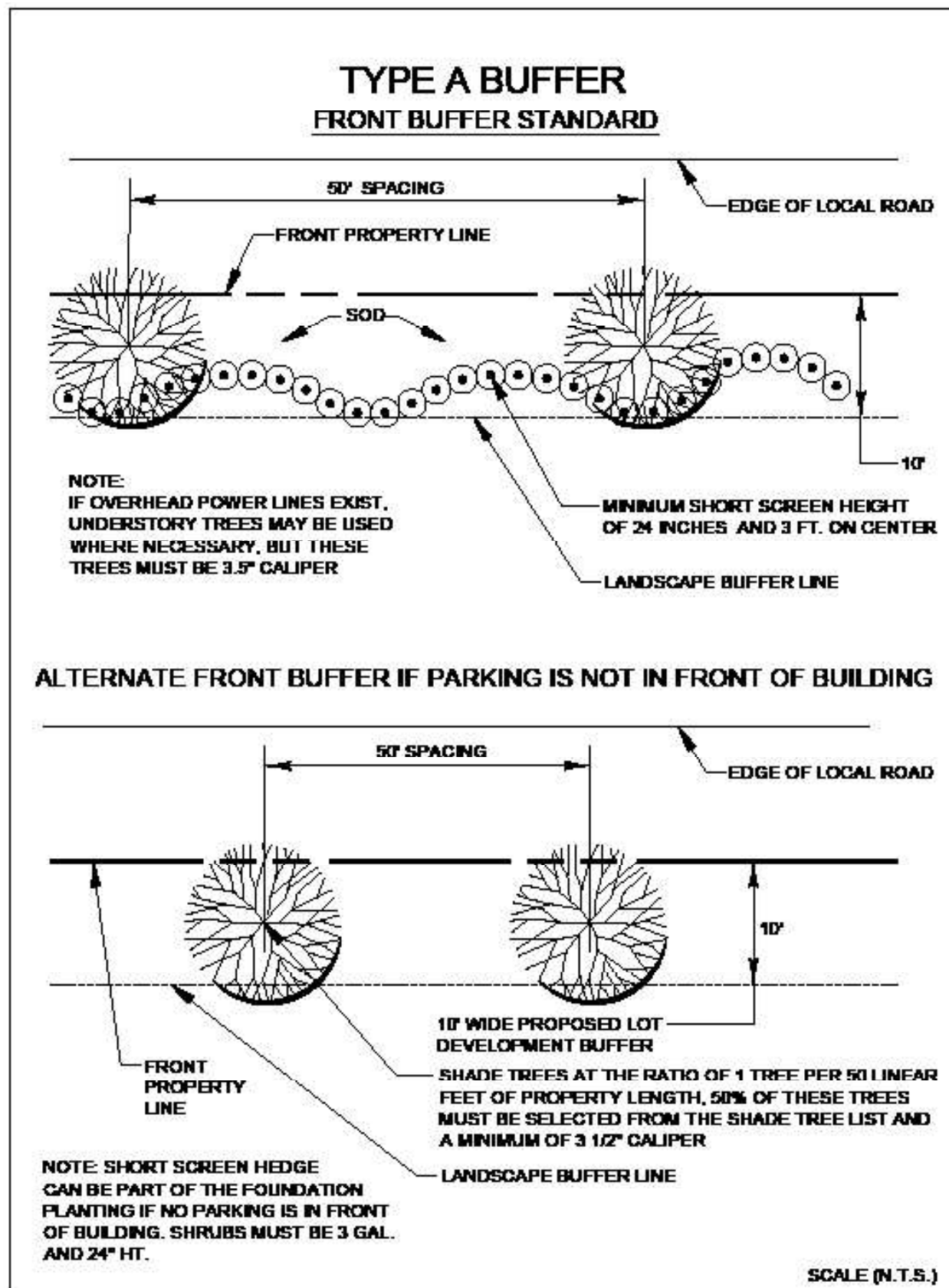


VII. LANDSCAPE BUFFER REQUIREMENTS

A. Buffer Design Standards

1. Front Standard

(See Buffer Type A and Buffer Type B in Section VI.)





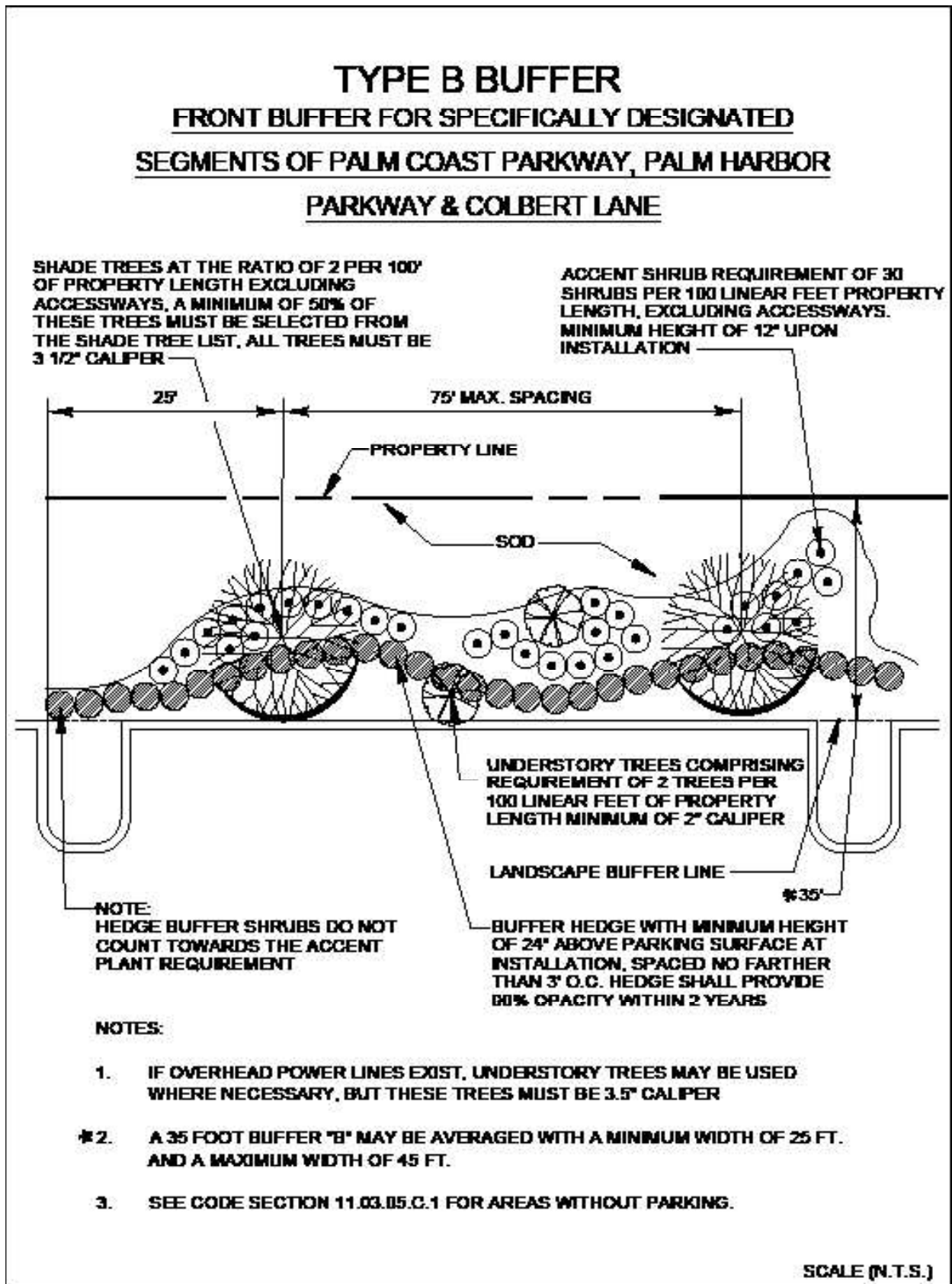
Type A Buffer



Type B Buffer

2. Side or Rear Standard

(High proposed development adjacent to very low, or very high retention pond or existing canal development.)



(High proposed development adjacent to very low, or very high retention pond or existing canal development.)

SIDE OR REAR STANDARD IF ADJOINING LOT IS NOT DEVELOPED



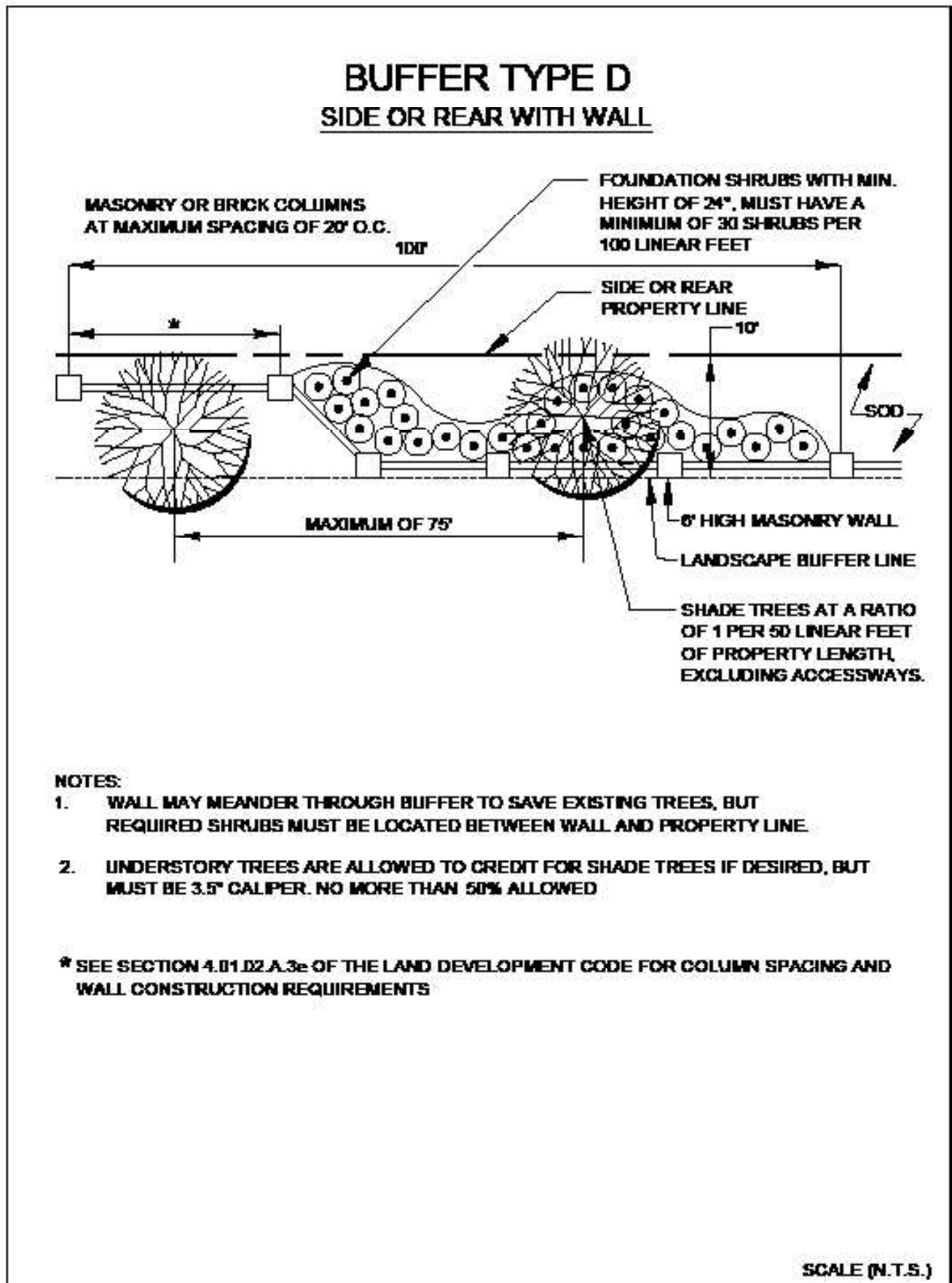


Type C Buffer

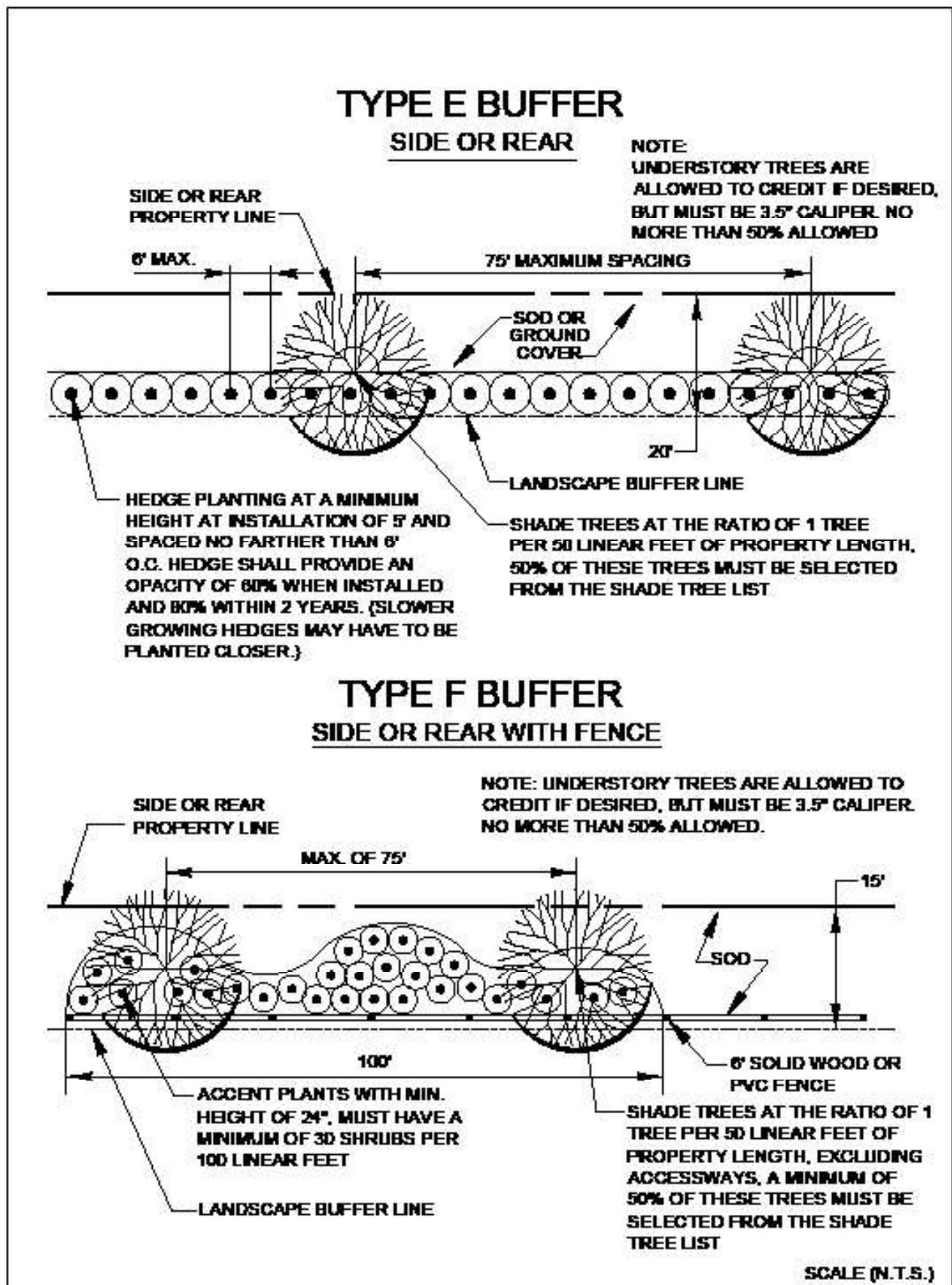


Type D Buffer

3. Side or Rear Masonry Wall - Providing Ten (10) foot Buffer Width (BUFFER TYPE D)



4. Side or Rear without and with a fence- Providing Twenty (20) foot buffer Width or (15) foot Buffer Width (Very high proposed development adjacent to very low, low, medium, or high retention pond or canal existing development.)





Type E Buffer



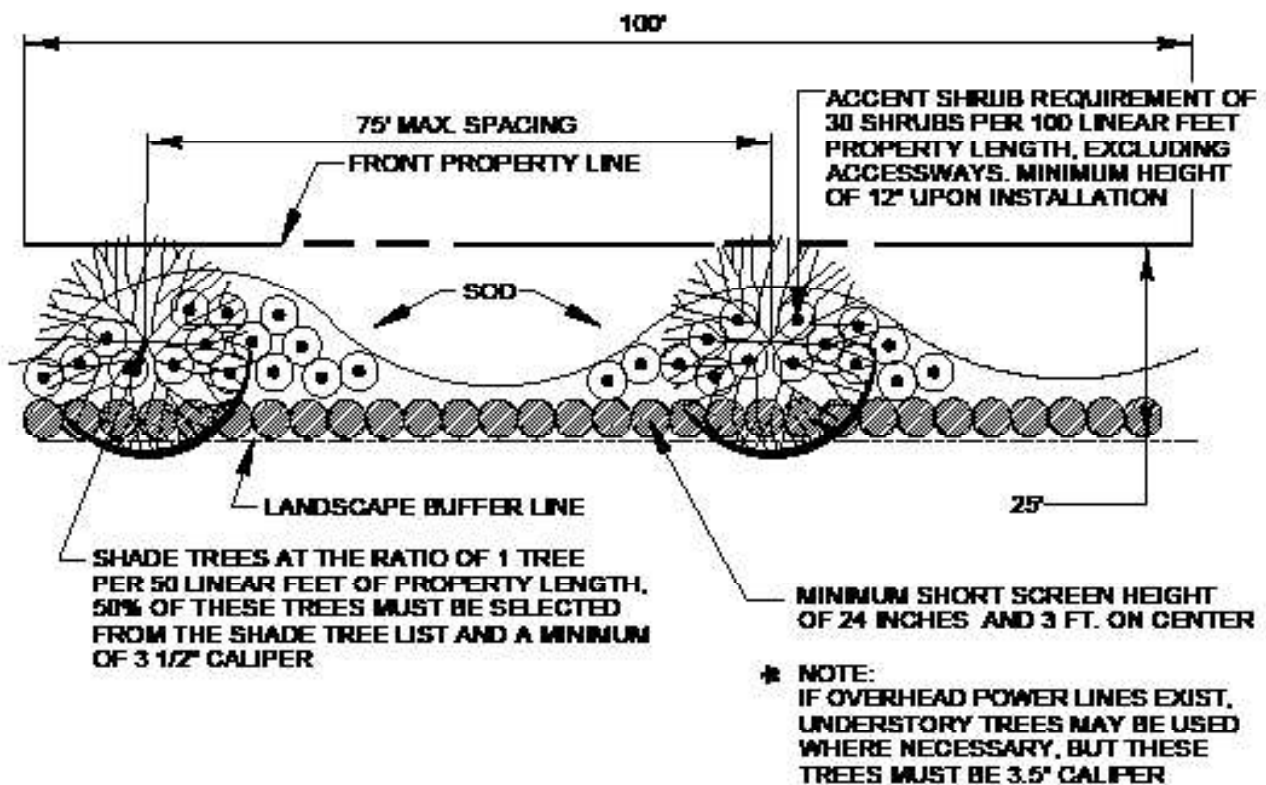
Type F Buffer

5. Other Specifically Designated Roads

TYPE G BUFFER

OTHER SPECIFICALLY DESIGNATED ROADS OR SEGMENTS OF:

BELLE TERRE PARKWAY, BELLE TERRE BLVD., COLBERT LANE,
CYPRESS POINT PARKWAY, I-95, MATANZAS WOODS PARKWAY,
OLD KINGS ROAD, PALM COAST PARKWAY, PALM HARBOR PARKWAY,
PINE LAKES PARKWAY, ROYAL PALMS PARKWAY, S.R. 100, SEMINOLE
WOODS PARKWAY, U.S. 1, AND WHITE VIEW PARKWAY



SCALE (N.T.S.)

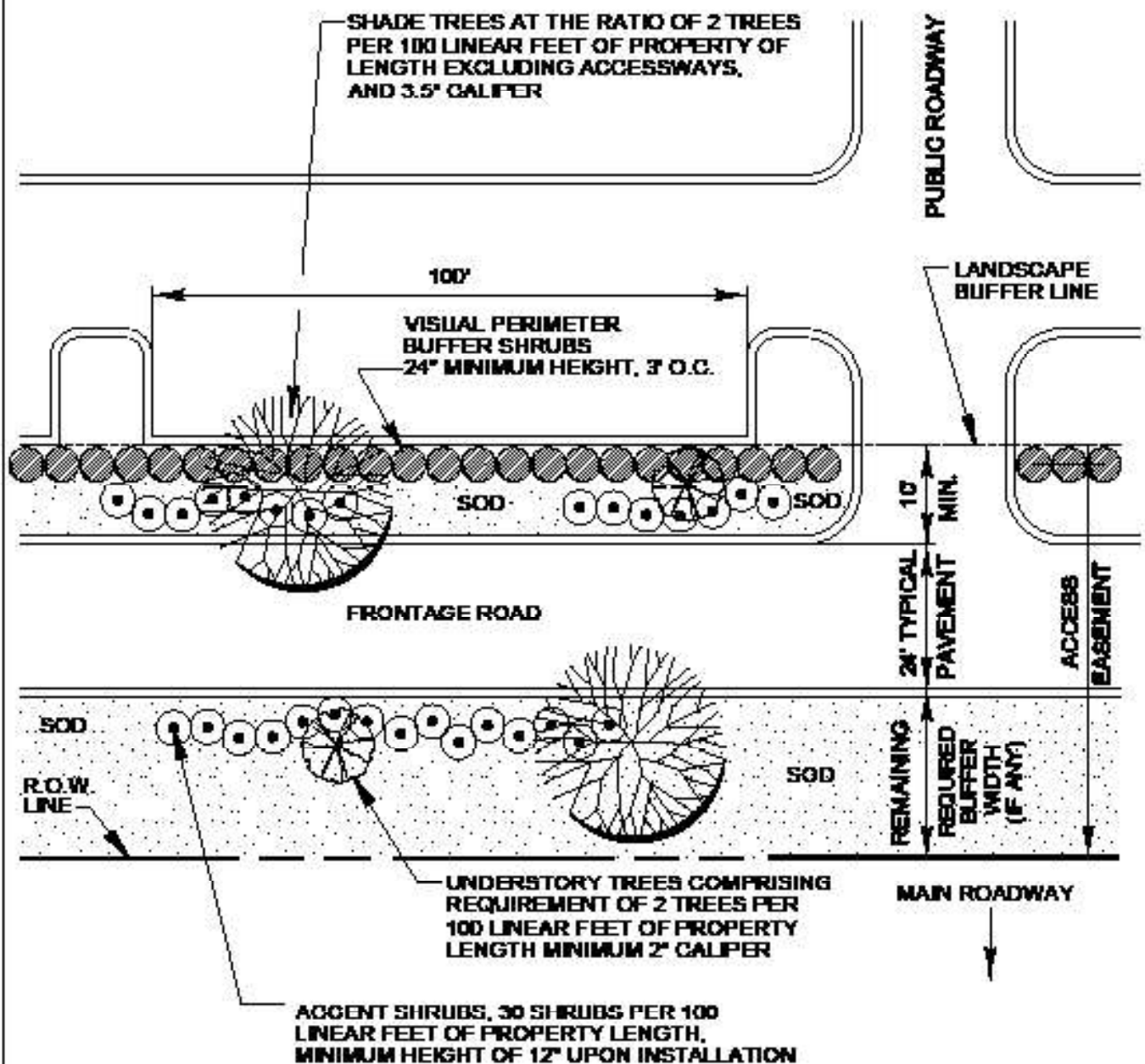


Type G Buffer

B. Miscellaneous Buffer Requirements

BUFFER ILLUSTRATION WITH FRONTAGE ROAD (WITH OR WITHOUT PARKING)

NOTE:
IF OVERHEAD POWER LINES EXIST,
UNDERSTORY TREES MAY BE USED
WHERE NECESSARY BUT THESE
TREES MUST BE 3.5" CALIPER



SCALE (N.T.S.)

C. Photos of Buffer Types



Example of section 11.03.05.D.2 Frontage Road Buffers. Example of an access road landscaping showing trees and shrubs on both sides of the road. Parking is screened from public view.

Good example of fleet parking area screening with 5 foot tall shrubbery (see below).



VIII. IRRIGATION DESIGN STANDARDS

The following irrigation design standards shall apply to all properties unless otherwise exempted:

- A. All irrigation equipment (sprinklers, rotors and micro-irrigation devices) within a given zone shall have the same precipitation rate (i.e. - rotors cannot be on the same zone as spray heads).
- B. Irrigation systems for all non-residential zoning districts (unless 100% xeric plants are utilized, if St. Augustine, Zoysia or Bermuda Grass is used the zones shall separate the irrigation based on planting design water requirements. Fifty percent (50) of the pervious area of the site must be planted (or preserved) with xeric or native plant material and this material shall be irrigated separately from other non-xeric/native shrubs.
- C. For SFR/DPX Developments, no irrigation system is required. However, if a non-drought tolerant type of grass is used (i.e. - St. Augustine) a note is required on the plot plan submittal stating an underground permanent irrigation system will be installed prior to final certificate of occupancy issuance. Irrigation plan submittal is not required.
- D. All irrigation heads shall be no closer to building structures than twelve (12) inches per the Florida Building Code.
- E. Minimum pipe cover over mainlines shall be eighteen (18) inches and twelve (12) inches for lateral lines. Drip irrigation lines, at a minimum, shall be covered with mulch.
- F. Wells, pumps, electrical control devices, and other related items relating to irrigation systems, unless specifically authorized by the City, shall not be permitted in the public rights-of-way.
- G. Irrigation system shall be designed to avoid spraying onto sidewalks that are constructed for or used by the public. Watering onto impervious surfaces shall be minimized.
- H. All valves and wire splices shall be in valve boxes at the proper grade and the wire connections water proofed.
- I. All spray heads shall be equipped with in-body pressure regulation in order to conserve water and improve distribution uniformity. Heads shall have identification from the top.
- J. Irrigation controller shall be programmable by the minute and be equipped with battery back-up or non-volatile memory (ability to maintain program without power). A card shall be placed in the controller noting whether each zone is a rotor zone or spray zone, the area of the site that zone covers and the recommended run time.
- K. Except for backflow preventers, all above ground exposed piping or risers shall be painted black or dark green to blend in with buffer plantings.
- L. All above ground piping shall be galvanized, brass, or Schedule 40 PVC. If PVC pipe is used, it shall either be either painted black or dark green or enclosed so as to protect it from sunlight. All pumps shall be required to be bolted to a concrete slab and enclosed.
- M. In required public parking areas drip irrigation is encouraged. Irrigation heads, if used, in parking lot islands shall be of the underground pop-up type with height determined by the height of the specific plant material around it. Any shrub risers along the end of a parking lot stall shall be set back a minimum of twenty-four (24) inches from the face of the curb or parking stop. Risers shall be staked if they are not able to be vertical with the ground when operating.
- N. If drip irrigation is used, a filter and pressure regulation device must be installed in a valve box on the system and flush plugs at the end of each line installed and placed in a valve box for location and servicing.
- O. Head-to-head coverage shall be delineated on the plans. Irrigation plans shall include gallon per minute discharge rates per zone.
- P. Irrigation shall be designed in the most water efficient means as possible.
- Q. A nozzle chart shall be included in the plans indicating the gallons per minute discharge for each type of nozzle.

- R. Where re-use water is available, it shall be utilized in lieu of any other water source. If re-use water is used or planned to be used at some future date, all irrigation mainline piping, control valve box covers, risers and irrigation heads shall be colored purple. Additionally, signs shall be posted in conspicuous locations on the site stating "Re-Use water – Do not drink".
- S. Any proposed tree planting in which the tree is three and one-half inch (3½") caliper or larger shall have an irrigation bubbler installed within the watering ring at time of planting.
- T. Measurements from 2 fixed points for valves, splice boxes, and flush or air relief valves, gate valves.



PLANNING DIVISION

AFFIDAVIT OF INSPECTION FOR IRRIGATION AS-BUILTS

This form is to certify that the project landscape architect has personally visited the site known as _____

and located at _____

I, as project landscape architect attest that the following items have been included in the as-built irrigation drawings:

- Measurements from two fixed points for all valves, wire splices, road bores and flush and air relief valves for drip irrigation.
- Correct manufacturer and model numbers for all materials if different from the approved plans.
- If reuse water was utilized, re-use signage posted and purple pipe, valve box covers, purple caps for spray, rotor and bubblers used.
- General location and quantity of all rotor and spray heads and mainline route.
- A card in the controller that states what area of the site is irrigated by what zone and whether the zone is a spray, rotor, bubbler or drip zone.
- Rain sensor is present, functional and installed where trees, wind or buildings will not obstruct or affect the accurate collection of rain water.
- Overspray onto paved surfaces is minimized as much as possible.
- Valve boxes at correct grade and not filled with mud or dirt.
- Rotors are not on the same zone as spray heads.

Signed _____
Printed Name of Project Landscape Architect

Date _____

Landscape Architect
Seal above

160 LAKE AVENUE, PALM COAST, FL 32164 • TEL (386) 986-3760 • FAX (386) 986-2590

H:\PRE-CON LANDSCAPE INFORMATION\AFFIDAVIT OF INSPECTION-1-3-16.DOC

APPENDIX A:

- I. TREE SURVEY INVENTORY SHEET
- II. MITIGATION WORKSHEETS (MFR/COM/IND & SUBD DEVELOPMENTS)
- III. REPLACEMENT TREE CREDITS

APPENDIX B:

- I. SEED AND MULCH SPECIFICATIONS FOR DISTURBED AREAS

APPENDIX C:

- I. MFR/COM and IND DEVELOPMENT REVIEW CHECKLIST
- II. SUBD DEVELOPMENT REVIEW CHECKLIST
- III. SFR/DPX DEVELOPMENT REVIEW CHECKLIST

APPENDIX D:

- I. CU-STRUCTURAL SOIL SPECIFICATIONS
- II. FIRE HYDRANT DETAIL

I. TREE SURVEY INVENTORY SHEET

[illegible]

B. Palm Trees to be Removed

Total Palm Trees Removed = _____

TREE SURVEY INVENTORY SHEET (continued)

C. Specimen Trees to be Removed (Anywhere on site):

Quantity	Tree Type	Diameter Size
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Total Diameter of Specimen Tree Inches Removed = _____

D. Historic Trees to be Removed (Anywhere on site):

Quantity	Tree Type	Diameter Size
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Total Historic Tree Inches Removed = _____

APPENDIX A:

II. TREE MITIGATION WORKSHEET

(MFR/COM/IND & SUBD DEVELOPMENT)

A. Protected trees within the required landscape buffer:

1. _____ diameter inches of protected trees removed X 70% = _____ diameter inches. Total replacement inches = _____ inches \div 2.5 = _____ replacement trees at two and a half (2½) inches caliper.
2. _____ Palm trees 8' clear trunk & taller removed X 40% = _____ replacement Palms. Minus replacement credits of _____ palms = _____ replacement palms with minimum eight (8) feet clear trunk.

B. Specimen trees and Historic trees anywhere on site:

1. _____ diameter inches of specimen trees removed X 70% = _____ diameter inches minus replacement credits of _____ diameter inches. Total replacement inches = _____ inches \div 3 = _____ replacement trees at three (3) inches caliper.
2. _____ diameter inches of historic trees removed X 100% = _____ diameter inches \div 3.5 = _____ replacement trees at three and one half (3-1/2) inches caliper.

APPENDIX A:

III. TREE MITIGATION WORKSHEET (SFR / DPX Development)

A. Specimen and Historic Trees anywhere on site*:

If lot is developed or being developed, replacement tree size for specimen trees is one (1) shade tree with a two inch (2") caliper. For historic trees, replacement is two (2) trees at a two inch (2") caliper for each tree removed.

Note: In all cases above, replacement is not required if:

- a. Tree is damaged or diseased/dead.
- b. Tree preservation not possible within the build-able area.
- c. Required fill around the tree is necessary to achieve proper drainage and such drainage cannot be accomplished in any other way.
- d. Tree is within the building footprint.

APPENDIX A:
IV. TREE MITIGATION WORKSHEET

(REPLACEMENT TREE CREDITS)

A. Protected Trees:

Quantity	Tree Type	Diameter Size
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Total Diameter Inches Protected Tree Credit = _____

B. Specimen Trees:

Quantity	Tree Type	Diameter Size
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Total Diameter Inches of Specimen Tree Credit = _____

C. Palm Trees:

Quantity = _____

= Total number of Palm Tree Credits = _____

APPENDIX B: SEED AND MULCH SPECIFICATIONS FOR DISTURBED AREAS

On all MFR/COM/IND, SUBD and SFR/DPX projects within the City, prior to the certificate of occupancy being issued, all areas subject to erosion are required to be sodded. Upon City approval, other areas not deemed to be subject to erosion may be seeded. In order to provide an acceptable cover within a reasonable period of time, specifications are needed for seeding and mulching and are listed as follows:

A. Spring/Summer Seeding Mix (from March through October)

- | | | |
|----|------------------|---------------------------------|
| 1. | Pensacola Bahia | @ 60% of seed mix = 36 lbs/acre |
| 2. | Common Bermuda | @ 20% of seed mix = 12 lbs/acre |
| 3. | Brown Top Millet | @ 20% of seed mix = 12 lbs/acre |
| | | <hr/> |
| | | 60 lbs/acre |

B. Fall/Winter Seeding Mix (From November through February)

- | | | |
|----|-----------------|---------------------------------|
| 1. | Pensacola Bahia | @ 60% of seed mix = 36 lbs/acre |
| 2. | Common Bermuda | @ 20% of seed mix = 12 lbs/acre |
| 3. | Annual Rye | @ 20% of seed mix = 12 lbs/acre |
| | | <hr/> |
| | | 60 lbs/acre |

C. Mulch Material Specifications

1. Mulch material is typically straw or hay that is cut into the seeded area at the rate of thirty (30) bales of straw or hay per acre

APPENDIX C:

I. MFR/COM AND IND DEVELOPMENT REVIEW CHECKLIST

GENERALLY FOR TOWNHOUSE, CONDOMINIUM, MULTIFAMILY, AND ALL NONRESIDENTIAL DEVELOPMENT PLANS

- A. Plan Submittal - Landscape plans must be signed and sealed by a Florida registered landscape architect and irrigation plans submitted by same or other licensed professional capable of signing and sealing the plans per Florida statutes. Signed and sealed as-built drawings two (2) required by same.
- B. Tree Survey - Survey current (within twenty-four (24) months). Must locate all protected trees six (6) inches diameter and larger from the property lines to five (5) feet past the property line, except as provided in Section 11.02.02D. Protected trees within any adjacent rights-of-way extending to the nearest street pavement shall be included in the survey. Wetlands need not be surveyed unless impacts involving tree removal are proposed. Specimen and historic trees anywhere on the site (except wetlands) must be located.
- C. Tree Coverage Requirements - One (1) tree for every 2,500 square foot of total lot area. All calculations are rounded up (i.e., if calculation is 4.4 trees, four (4) trees would be needed, if it is 4.5, then five (5) trees would be needed).
- D. Tree Location - Shade trees must be planted around the perimeter of the site at either fifty (50) feet on center or twenty-five (25) feet on center, depending upon buffer type and adjacent zoning density.
- E. Tree and Shrub Quality - All trees and shrubs must be a Florida number one or better quality as per the most recent edition of Grades and Standards for Nursery Plants, Florida Department of Agriculture and Consumer Services.
- F. Shade Trees - Please see the recommended list of Shade Trees in this manual. Palms can be credited in lieu of shade trees, but cannot exceed more than twenty-five (25) percent of the tree requirement (i.e., if the required number of trees is four (4), then one (1) shade tree can be eliminated and replaced with palm trees. In order to credit, three palms @ eight (8) feet clear trunk in size = one (1) shade tree credit).
- G. Understory Trees - Please see the recommended list of Understory Trees in this manual.
- H. Tree Size - Shade trees must measure at least three and a half (3½) inches caliper (measured six (6) inches above grade). Understory trees must measure at least one and a half (1½) inches caliper and be in a fifteen (15)-gallon container. Palms must measure a minimum of eight (8) feet clear trunk in height. If understory trees must be used in lieu of shade trees due to overhead or underground utility constraints, then these trees will need to be a minimum of three and a half (3½) inches caliper.
- I. Shrub Size and Type - Foundation shrubs, three (3)-gallon container, groundcovers, one (1)-gallon container. Required foundation shrubs must be evergreen and freeze tolerant (plants such as hibiscus, crotons, dwarf schefflera, as examples, are not cold hardy and are not permitted).

- J. Accent Plant Size - For frontage on specific arterial and collector roads, accent plants are required and shall be planted at the rate of thirty (30) shrubs per 100 lineal feet of frontage width. Size for these plants must be a minimum of twelve (12) inches in height.
- K. Landscape Buffers - Type of buffer determined in subsection 11.03.05 of the LDC. A minimum of fifty (50) percent of the existing vegetation shall be preserved in required buffer areas. If not possible due to site conditions or insufficient to provide required screening, then native or xeric plant material shall be used.
- L. Native and Xeric Vegetation - At least fifty (50) percent of the pervious areas of the site must be either preserved native vegetation or planted with native plants or plants and sod that conserve water, adapt to local conditions and are drought tolerant as noted in this technical manual.
- M. Retention and Detention Ponds - Refer to section 11.03.01.G and 11.03.05.C.6.c of the LDC.
- N. Utility/Mechanical Structure Screening - All utility structures, sheds, lift stations, utility cabinets, backflow preventers, wells, pumps, tanks, and mechanical equipment shall be screened with medium screen buffer plantings when visible from rights-of-way, parking areas, or adjacent properties. Minimum height of shrubs is thirty (30) inches and seven (7)-gallon container. Fences can be used in lieu of vegetation.
- O. Monument Signs - Requires shrubs or flowers around the perimeter of the sign base.
- P. Parking Lot Landscape Requirements –
1. VUA Requirement - Need vehicular use area calculations (VUA). Show total VUA times 10% then divide that number by 165 = number of required VUA credits internal to parking lot area.
 2. VUA Credits - Each VUA island for credit requires one (1) shade tree = 2 credits.
(3) Palm trees = 1.5 credits or (1) Understory tree = 1 credit.
 3. VUA Table - Provide a table listing all VUA islands by letter designation with area and number of VUA credits requested. Total credits at bottom and verify it meets or exceeds the minimum needed.
 4. Palm Trees - Palms can be used for shade tree credits in parking lot islands, but no more than twenty-five (25) percent of the VUA requirement can be met with palms. Three (3) palms = 1.5 shade tree credits.
 5. Maximum Spaces between Islands - No more than ten (10) spaces is allowed without a required VUA island and no more than five (5) parallel parking spaces without a VUA island. See flexibility options in subsection 11.03.04.B.6 of the LDC for other options.
 6. Buffer Requirements - Visual screening shrubs must be non-deciduous and a minimum of twenty-four (24) inches in height planted three (3) feet on center. Site grading must be considered as top of the visual buffer shrubs must be a minimum of twenty-four (24) inches above the adjacent parking surface.
 7. Shade trees- VUA islands with shade trees must be a minimum of 300 square feet in area.

- Q. Wildfire Hazard Assessment - A wildfire hazard assessment for the site must be prepared and certified by a forester, wildfire mitigation expert or landscape architect. If rating is medium or higher, see subsection IV, F - Wildfire Hazard Assessment in this Section of this manual for suggested actions to be implemented. Also, see www.firewise.org for more information.
- R. Irrigation Requirements - See Irrigation Design Standards in Section VIII of this manual as well as subsection 11.03.06 of the LDC.
- S. Tree Mitigation - If any protected trees are proposed for removal, within buffer areas or specimen/historic trees anywhere on the site, a tree mitigation form must be submitted as found in Appendix A of this manual (see also Table 11-2).
- T. Required Clearances - Minimum clearances for utilities, flagpoles, and light fixtures are as follows:
1. Fire Hydrants— Seven (7) feet from the front and sides, four (4) feet from the rear. See attached detail in Appendix D of this manual.
 2. Water Lines— Ten (10) feet separation from shade trees to water lines.
 3. Light Poles/Flagpoles— Light poles and flagpoles shall not be placed in landscape islands of less than 500 square feet that contain shade trees. Separation between light poles and shade trees located anywhere on the site should not be less than fifteen (15) - twenty (20) feet.
 4. Utility Cabinets— Minimum clearances per the owning utility standards.
 5. Water Meters— Vegetation cannot completely surround the meter boxes and backflow prevention devices. Vegetation shall not hinder access to meter boxes and backflow prevention devices. 2.5 ft., or 30 inches, of clearance should be provided around the meter box and backflow prevention device. See attached detail in Appendix D of this manual.

APPENDIX C:

II. DEVELOPMENT REVIEW CHECKLIST FOR SUBDIVISIONS

- A. Tree Density and Size Requirements - Same as MFR /COM / IND for all common areas of the subdivision.
- B. Tree and Shrub Quality - Same as MFR /COM / IND.
- C. Street Tree Requirement - Street tree plantings required per subsection 11.03.01.J of the LDC for all MFR / COM / IND Developments and along common areas of SFR / DPX subdivisions.
- D. Tree Mitigation - No mitigation for trees on Single-Family or Duplex lots if minimum density is maintained. The only exception is for specimen tree removal which is only planting one 2" caliper shade tree. Historic tree removal requires two trees at 2" caliper.
- E. Tree Survey - All protected trees six (6) inches diameter and larger within common areas to be surveyed within the required landscape buffers plus an additional 5' outside the property limits. All specimen and historic trees anywhere on the site (except wetlands) to be surveyed.
- F. Wildfire Hazard Assessment - Same as MFR /COM / IND.
- G. Sales Trailer - Temporary sales trailers shall be adequately landscaped around all four (4) sides to screen undersides of the trailer.
- H. Native Vegetation - Fifty percent (50%) of the pervious area of the common areas of the subdivision are required to be preserved in their native state. If this is not possible, these areas can be planted in native plants or plants and grasses that are drought tolerant.
- I. Screening Plantings - Mechanical equipment, backflow preventers, wells and lift stations, HVAC units, transformers, cable TV equipment boxes, utility cabinets, backflow preventers, above ground tanks, electrical panels, and dumpster enclosures are to be fully screened from the public right-of-way and adjacent properties. Height of screening plant at time of installation is thirty (30) inches and four (4) feet on center, with a container size of 7 gallon.

APPENDIX C:

III. SFR / DPX DEVELOPMENT REVIEW CHECKLIST

FOR SINGLE-FAMILY AND DUPLEX HOMESITES

- A. Number of Trees Required - One (1) tree for every 2,500 square foot of total lot area. All calculations are rounded up (i.e., if calculation is 4.4 trees, four (4) trees would be needed, if it is 4.5, then five (5) trees would be needed).
- | | | | |
|-------------------------|---|----|-------|
| 6,250 sq. ft. and over | = | 3 | trees |
| 8,750 sq. ft. and over | = | 4 | trees |
| 11,250 sq. ft. and over | = | 5 | trees |
| 13,750 sq. ft. and over | = | 6 | trees |
| 16,250 sq. ft. and over | = | 7 | trees |
| 18,750 sq. ft. and over | = | 8 | trees |
| 21,250 sq. ft. and over | = | 9 | trees |
| 26,250 sq. ft. and over | = | 10 | trees |
| etc..... | | | |
- B. Type of Trees - Regardless of lot size, a minimum of one (1) shade tree shall be provided, preferably in the front yard. At least two (2) shade trees shall be provided on lots at least 1/3 acre but less than 2/3 acre, three (3) shade trees shall be provided on lots 2/3 acre but less than one (1) acre, and four (4) shade trees shall be provided on lots one (1) acre or larger.
- Additional note: Palms can be credited in lieu of shade trees, but cannot exceed more than fifty (50) percent of the tree requirement (i.e., if the required number of trees is four (4), then two (2) shade trees can be eliminated and replaced with palm trees. In order to credit, three palms @ eight (8) feet clear trunk in size = one (1) shade tree. Smaller palms such as Pindo Palm or Chinese Fan Palm can count 1:1 for understory tree credits but must be at least three (3) of clear trunk tall. In all cases, at least one shade tree is required.
- C. Tree Location - A minimum of one (1) tree in the front and one (1) tree in the back of the house and at least one (1) of these trees must be a shade tree. Street trees can be counted towards this requirement if they are located on the property and not in the right-of-way.
- D. Tree Size - Plans to be stamped by the technician with the following information on it, "Shade trees must measure at least two (2) inches caliper (measured six (6) inches above grade). Understory trees must measure at least one and a half (1½) inches caliper and be in a fifteen (15)-gallon container. Palms must measure a minimum of eight (8) feet clear trunk in height for shade tree requirement and three (3) of clear trunk tall."

- E. Shrub Size and Type - Foundation shrubs, three (3)-gallon container, groundcovers, one (1)- gallon container. Required foundation shrubs must be evergreen and freeze tolerant (see below samples of shrubs that are not permitted to be used as required foundation or screening shrubs):

NON CREDIT PLANTINGS (Not cold tolerant in our area)

Crotons
 Hibiscus
 Schefflera spp.
 Plumbago
 Citrus
 Queen Palms
 Traveler Palms
 Foxtail Palms
 Triangle Palms
 Pigmy Date Palms
 Bottle Palms
 Norfolk Island Pine
 Ponytail Palms
 Bougainvillea
 Gold Duranta

Commonly Used Approved Shrubs

Common Name	Mature Height	Spacing
'Schillings' Holly	2 -5'	3'
'Nana' Holly	2 -5'	3'
Rotunda Holly	4 -5'	3'
Burford Holly	6 -8'	3'
Indian Hawthorn	4 -5'	3'
Kurume Azalea	4 -6'	3'
Glossy Abelia	6 -8'	3'
Formosa Azalea	8 -10'	3'-4'
Cleyera	8 -10'	3'-4'
Star Anise	6 -12'	3'-4'
Ligustrum (Japanese Privet)	8 -10'	3'-4'
Ligustrum (Chinese Privet)	10 -12'	3'-4'
Loropetalum (Chinese Fringe Bush)	10 - 12'	3'-4'
Pineapple Guava	16 - 18'	3'-4'
Pittosporum	6 - 8'	3'-4'
Podocarpus	6 - 8'	3'-4'
Sweet Viburnum	15 -20'	3'-4'
Sandanqua Viburnum	8 - 10'	3'-4'

- F. Tree and Shrub Quality - All trees and shrubs must be a Florida number one or better quality as per the most recent edition of Grades and Standards for Nursery Plants, Florida Department of Agriculture and Consumer Services.
- G. Tree Mitigation - Mitigation only required if a healthy specimen or historic tree is removed. Mitigation is one (1) 2" caliper shade trees.
- H. Irrigation System/ Sodding Requirements - Plans to be stamped by the technician with the following information on it, "If any non-drought tolerant species of grass is used (i.e., St. Augustine), then an automatic underground irrigation system will be installed prior to final landscape inspection.
- I. SFR/DPX Landscaping Location for Foundation Plantings - Plantings shall be provided along the following exposures:
1. Residential homes shall provide foundation plantings consisting of sixteen (16) shrubs. On interior lots, eight (8) shrubs shall be planted in front of the home, and four (4) shrubs planted on each side of the home. On corner lots, six (6) shrubs shall be planted on each side of the home facing a street, and four (4) shrubs planted on the interior side of the home. When the rear yard of a home faces a saltwater canal, lake, or golf course, an additional four (4) shrubs shall be planted along the rear of the home.
 2. All of these required shrubs shall be planted between two and one-half (2 1/2) and eight (8) feet of the home's foundation.
 3. The corners of the house shall be wrapped with shrubbery or have an understory tree planted there. Shrubby shall be selected using varying heights to accent and soften walls.
- J. Street Tree Requirements - Requirement of one (1) tree in front yard satisfies this. Tree is preferred to be a shade tree.
- K. Utility Structures – Individual structures, such as mechanical equipment, backflow preventers, wells, pumps, above ground tanks, rain barrels, and HVAC equipment, shall be screened with a medium shrub buffer planting 7-gallon container size (minimum 30" in height and spaced 4' max. on center at the time of planting) if these structures are visible from adjacent properties.

APPENDIX D:

I. CU-STRUCTURAL SOIL SPECIFICATIONS

CU-STRUCTURAL SOIL[®] SPECIFICATIONS

PART 1 – DESCRIPTION AND SPECIFICATION

1.1 GENERAL

- A. The specifications provided in this section consist of and are applicable to the research-based structural soil, urban tree soil mix, to safely increase rooting volumes and marketed under the registered trademarks CU-Structural Soil[®] and/or CU-Soil[®]. Only AMERBQ-licensed companies are authorized to produce this material utilizing the specifications described in this text and the method provided only to licensed producers.

For a list of licensed structural soil producers call AMERBQ, INC. at 800-832-8788 or email blw@amerbq.com

1.2 REFERENCES AND STANDARDS

- A. The following references are used herein and shall mean:

ASTM: American Society of Testing Materials

USDA: United States Department of Agriculture

AASHTO: American Association of State Highway and Transportation Officials

Standard Specifications: Regional or Municipal Standard Specifications Documentation for the location of proposed usage

AOAC: Association of Official Agricultural Chemists

1.3 SAMPLES AND SUBMITTALS

No materials shall be ordered until the required samples, certificates, manufacturer's literature, producer's current license and test results have been reviewed and approved by the landscape architect and/or engineer. The engineer reserves the right to reject any material that does not meet CU-Structural Soil[®] specifications. Delivered materials shall closely match the approved samples.

- A. Contractor to submit from AMERBQ-licensed producer, 1/2 cubic foot representative sample of clay loam, one cubic foot representative sample of crushed stone, and one cubic foot representative sample of CU-Structural Soil[®] mix for approval. In the event of multiple source fields for clay loam, submit a minimum of one set of samples per source field or stockpile. The samples of all clay loam, crushed stone, and CU-Structural Soil[®] shall be submitted to the engineer as a record of the soil color and texture.
- B. Contractor to submit from AMERBQ-licensed producer, soil test analysis reports for sample of clay loam from an independent soil-testing laboratory. (soil testing laboratory may include a public agricultural extension service agency)
1. Submit a mechanical analysis of the clay loam sample and particle size analysis including the following gradient of mineral content:

USDA Designation
Gravel

Size in mm.
+2 mm

CU-STRUCTURAL SOIL® SPECIFICATIONS

Sand	0.05 – 2 mm
Silt	0.002-0.05 mm
Clay	minus 0.002 mm

Sieve analysis shall be performed and compared to USDA Soil Classification System.

Sieve analysis shall be done by a combined hydrometer and wet sieving using sodium hexametaphosphate as a dispersant in compliance with ASTM D422 after destruction of organic matter by hydrogen peroxide.

2. Contractor to submit from AMEREQ-licensed producer, a chemical analysis, performed in accordance with current AOAC Standards, including the following:
 - a. pH and buffer pH.
 - b. Percent organic matter as determined by the loss of ignition of oven dried samples. Test samples shall be oven dried to a constant weight at a temperature of 230 degrees F, plus or minus 9 degrees.
 - c. Analysis for nutrient levels by parts per million.
 - d. Soluble salt by electrical conductivity of a 1:2 soil/water sample measured in Millihen per cm.
 - e. Cation Exchange Capacity (CEC).
 - f. Carbon/Nitrogen Ratio.
- C. Contractor to submit from AMEREQ-licensed producer, one cubic foot sample of crushed stone which will be used in production of CU-Soil®.
 1. Provide particle size analysis:

USDA Designation	Size in mm.
3"	+76 mm
2 1/4"	63-76 mm
2"	50-63 mm
1 1/2"	37-50 mm
1"	25-37 mm
3/4"	19-25 mm
Fine gravel	2-19 mm
 2. Provide the manufacturers analysis of the loose and rodded unit weight
 3. Losses from LA Abrasion tests- not to exceed 40%
 4. Minimum 90% with 2 or more fractured faces
 5. Percent pore space analysis
- D. At the engineer's discretion, the sample of CU-Structural Soil® may be tested for the following:
 1. Compaction in accordance with ASTM D698/AASHTO T99 without removing oversize aggregate
 2. California Bearing Ratio in accordance with ASTM D1883- soaked CBR shall equal or exceed a value of 50
 3. Measured dry-weight percentage of stone in the mixture
- E. The approved CU-Structural Soil® sample shall be the standard.

CU-STRUCTURAL SOIL® SPECIFICATIONS

- F. Any deviations from the specified crushed stone and clay loam specifications shall be approved by Amerseq, Inc.

L4 DELIVERY, STORAGE AND HANDLING

- A. Delivered CU-Structural Soil® shall be at or near optimum compaction moisture content as determined by AASHTO T 99 (ASTM D 698) and should not be placed in frozen, wet or muddy sites.
- B. Protect CU-Structural Soil® from exposure to excess water and from erosion at all times. Do not store CU-Soil® unprotected. Do not allow excess water to enter site prior to compaction. If water is introduced into the CU-Soil® after grading, allow water to drain to optimum compaction moisture content.

L5 EXAMINATION OF CONDITIONS

- A. All areas to receive CU-Structural Soil® shall be inspected by the installing contractor before starting work and all defects such as incorrect grading, compaction, and inadequate drainage shall be reported to the engineer prior to beginning this work.

L6 QUALITY ASSURANCE

- A. Qualifications of installing contractor: The work of this section should be performed by a contracting firm which has a minimum of five years' experience. Proof of this experience shall be submitted as per paragraph, SAMPLES and SUBMITTALS, of this section.

PART 2 – MATERIALS

21 CLAY LOAM

- A. Soil to produce CU-Structural Soil® shall be a "loam" with a minimum clay content of 20% or a "clay loam" based on the "USDA classification system" as determined by mechanical analysis (ASTM D-422) and it shall be of uniform composition, without admixture of subsoil. It shall be free of stones, lumps, plants and their roots, debris and other extraneous matter. It shall not contain toxic substances harmful to plant growth. Clay loam shall contain not less than 2% or more than 6% organic matter as determined by the loss on ignition of oven-dried samples. Test samples shall be oven-dried to a constant weight at a temperature of 230 degrees F., plus or minus 9 degrees.
- B. Mechanical analysis for the loam or clay loam shall be as follows:
- | <u>Textural Class</u> | <u>% of Total Weight</u> |
|-----------------------|--------------------------|
| Gravel | less than 5% |
| Sand | 20-50% |
| Silt | 20-45% |
| Clay | 20-40% |
- C. Chemical analysis: Meet, or be amended to meet the following criteria:
1. pH between 5.5 to 6.5 when using limestone, up to 7.2 when using granite or other non-limestone crushed stone.

CU-STRUCTURAL SOIL[®] SPECIFICATIONS

2. Percent organic matter 2% - 6% by dry weight
 3. Adequate nutrient levels
 4. Soluble salt less than 1.0 mmho/cm
 5. Cation Exchange Capacity (CEC) greater than 10
 6. Carbon/Nitrogen ratio less than 33:1
- D. Loam or clay loam shall not come from USDA - classified prime farmland.

2.2 FERTILIZER (if needed)

- A. Should nutrient analysis suggest that the loam or clay loam need additional nutrients, it shall be amended by Ameren's licensed producer.

2.3 SULFUR (if needed)

- A. Sulfur shall be a commercial granular, 96% pure sulfur, with material and analysis appearing on the labeled container.
- B. Sulfur used to lower pH shall be a ferrous sulfate formulation.
- C. Application rates shall be dependent on soil test results.

2.4 LIME (if needed)

- A. Agricultural lime containing a minimum of 85% carbonates.
- B. Application rates shall be dependent on soil test results.

2.5 CRUSHED STONE

- A. The size of the crushed stone shall be 0.75 inches to 1.5 inches allowing for up to 10% being greater than 1.5 inches, and up to 10% less than 0.75 inches.
- B. Acceptable aggregate dimensions will not exceed 2.5:1.0 for any two dimensions.
- C. Minimum 90% with two or more fractured faces.
- D. Results of Aggregate Soundness Loss test shall not exceed 18%.
- E. Losses from LA Abrasion tests shall not exceed 40%.

2.6 HYDROGEL

- A. Hydrogel shall be a coated potassium propenamate-propenamide copolymer (Gelscape[®] Hydrogel Tackifier) as manufactured by Ameren, Inc. 800-832-8788.

2.7 WATER

- A. The installing contractor shall be responsible to furnish his own supply of water (if needed) free of impurities, to the site.

CU-STRUCTURAL SOIL® SPECIFICATIONS

2.1 CU-STRUCTURAL SOIL®

- A. A uniformly blended urban tree mixture of crushed stone, clay loam and Gelscape® Hydrogel Tackifier, as produced by an Amerenq-licensed company, mixed in the following proportions:

<u>Material</u>	<u>Unit of Weight</u>
specified crushed Stone	100 units dry weight
specified clay loam	20 – 25 units (to achieve minimum CBR of 50)
Gelscape® Hydrogel Tackifier	0.035 units dry weight
	ASTM D698/AASHTO T-99 optimum moisture

PART 3 – PRODUCTION AND INSTALLATION GUIDELINES

3.1 CU-SOIL® MIXING AND QUALITY CONTROL TESTING

- A. All CU-Structural Soil® mixing shall be performed at the licensed producer's yard using appropriate soil measuring, mixing and shredding equipment of sufficient capacity and capability to assure proper quality control and consistent mix ratios. No mixing of CU-Structural Soil® at the project site shall be permitted.

Maintain adequate moisture content during the mixing process. Soils and mix components shall easily shred and break down without clumping. Soil clods shall easily break down into a fine crumbly texture. Soils shall not be overly wet or dry. The licensed producer shall measure and monitor the amount of soil moisture at the mixing site periodically during the mixing process.

- B. Raw materials shall be mixed off-site, only at the licensed producer's facility, on a flat asphalt or concrete paved surface to avoid soil contamination.
- C. Should the independent laboratory test results of the clay loam reveal a need to amend it to meet specifications, the amending materials should be added to the clay loam following the rates and recommendations provided by Amerenq, Inc.

3.2 UNDERGROUND UTILITIES AND SUBSURFACE CONDITIONS

- A. The installing contractor shall notify the engineer of any subsurface conditions which will affect the contractor's ability to install the CU-Soil®.
- B. The installing contractor shall locate and confirm the location of all underground utility lines and structures prior to the start of any excavation.
- C. The installing contractor shall repair any underground utilities or foundations damaged during the progress of this work.

3.3 SITE PREPARATION

- A. Do not proceed with the installation of the CU-Structural Soil® material until all walls, curb footings and utility work in the area have been installed. For side elements dependent on CU-Structural Soil® for foundation support, postpone installation of such elements until

CU-STRUCTURAL SOIL[®] SPECIFICATIONS

immediately after the installation of CU-Structural Soil[®].

- B. Install subsurface drain lines as shown on the plan drawings prior to installation of CU-Structural Soil[®] material.
- C. Excavate and compact the proposed subgrade to depths, slopes and widths as shown on the drawings. Maintain all required angles of repose of the adjacent materials as shown on the drawings. Do not over excavate compacted subgrades of adjacent pavement or structures.
- D. Confirm that the subgrade is at the proper elevation and compacted as required. Subgrade elevations shall slope parallel to the finished grade and/or toward the subsurface drain lines as shown on the drawings.
- E. Clear the excavation of all construction debris, trash, rubble and any foreign material. In the event that fuels, oils, concrete washout silts or other material harmful to plants have been spilled into the subgrade material, excavate the soil sufficiently to remove the harmful material. Fill any over excavations with approved fill and compact to the required subgrade compaction.
- F. Do not proceed with the installation of CU-Structural Soil[®] until all utility work in the area has been installed. All subsurface drainage systems shall be operational prior to installation of CU-Structural Soil[®].
- G. Protect adjacent walls, walks and utilities from damage. Use $\frac{1}{2}$ " plywood and/or plastic sheeting as directed to cover existing concrete, metal and masonry work and other items as directed during the progress of the work.
 - 1. Clean up all trash and any soil or dirt spilled on any paved surface at the end of each working day.
 - 2. Any damage to the paving or architectural work caused by the installing contractor shall be repaired, as directed by the engineer.
- H. Maintain all silt and sediment control devices required by applicable regulations. Provide adequate methods to assure that trucks and other equipment do not track soil from the site onto adjacent property and the public right of way.

3.4 INSTALLATION OF CU-STRUCTURAL SOIL[®] MATERIAL

- A. Install CU-Structural Soil[®] in 6 inch lifts and compact each lift.
- B. Compact all materials to at least 95% Proctor Density from a standard compaction curve AASHTO T 99 (ASTM D 698). No compaction shall occur when moisture content exceeds maximum as listed herein. Delay compaction if moisture content exceeds maximum allowable and protect CU-Structural Soil[®] during delays in compaction with plastic or plywood as directed by the engineer.
- C. Bring CU-Structural Soil[®] to finished grades as shown on the drawings. Immediately protect the CU-Structural Soil[®] from contamination by toxic materials, trash, debris, water containing cement, clay, silt or materials that will alter the particle size distribution of the mix with plastic or plywood as directed by the engineer.
- D. The engineer may periodically check the material being delivered, prior to installation for color and texture consistency with the approved sample provided by the installing contractor as part of the submittal for CU-Structural Soil[®]. If the engineer determines that the delivered CU-Soil[®] varies significantly from the approved samples, the engineer shall contact the

CU-STRUCTURAL SOIL® SPECIFICATIONS

licensed producer.

- E. Engineer shall ensure that the delivered structural soil was produced by the approved CU-Soil® licensee by inspecting weight tickets showing source of material.
- F. CU-Soil® should not be stockpiled long-term. Any CU-Soil® not installed immediately should be protected by a tarp or other waterproof covering.

3.5 FINE GRADING

- A. After the initial placement and rough grading of the CU-Structural Soil® but prior to the start of fine grading, the installing contractor shall request review of the rough grading by the engineer. The installing contractor shall set sufficient grade stakes for checking the finished grades.
- B. Adjust the finish grades to meet field conditions as directed.
Provide smooth transitions between slopes of different gradients and direction.
Fill all dips with CU-Soil® and remove any bumps in the overall plane of the slope.
 - a. The tolerance for dips and bumps in CU-Structural Soil® areas shall be a 3" deviation from the plane in 10'.All fine grading shall be inspected and approved by the engineer prior to the installation of other items to be placed on the CU-Structural Soil®.
- C. The engineer will inspect the work upon the request of the installing contractor. Request for inspection shall be received by the engineer at least 10 days before the anticipated date of inspection.

3.6 ACCEPTANCE STANDARDS

- A. The engineer will inspect the work upon the request of the installing contractor. Request for inspection shall be received by the engineer at least 10 days before the anticipated date of inspection.

3.7 CLEAN-UP

- A. Upon completion of the CU-Structural Soil® installation operations, clean areas within the contract limits. Remove all excess fills, soils and mix stockpiles and legally dispose of all waste materials, trash and debris. Remove all tools and equipment and provide a clean, clear site. Sweep, do not wash, all paving and other exposed surfaces of dirt and mud until the paving has been installed over the CU-Structural Soil® material. Do no washing until finished materials covering CU-Structural Soil® material are in place.

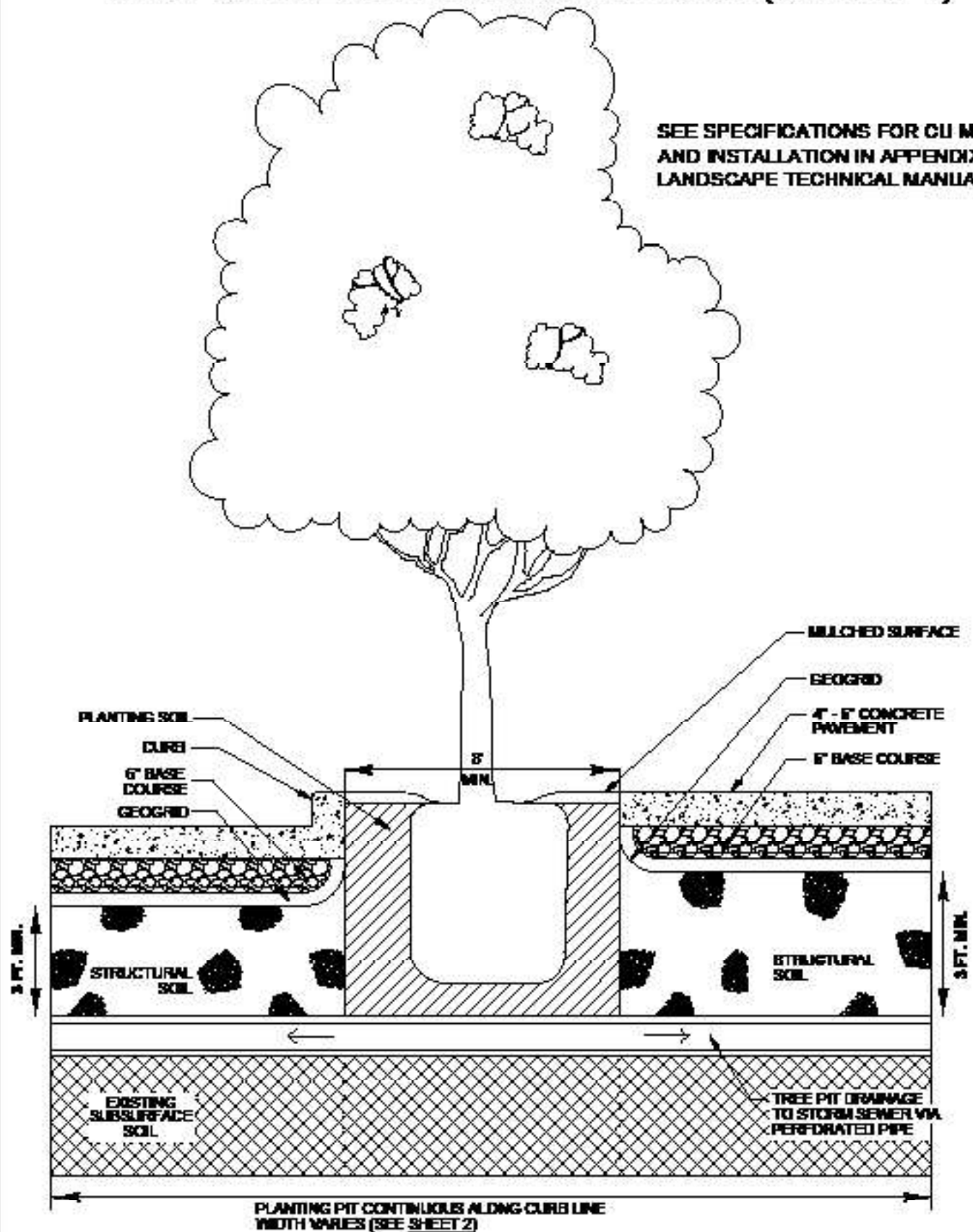
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Reg. TKN 2-087-262

END OF SECTION

TREE PLANTING DETAIL FOR LOCATIONS THAT UTILIZE STRUCTURAL SOIL (SHEET 1)

SEE SPECIFICATIONS FOR CU MIX
AND INSTALLATION IN APPENDIX OF
LANDSCAPE TECHNICAL MANUAL





II. Fire Hydrant Detail

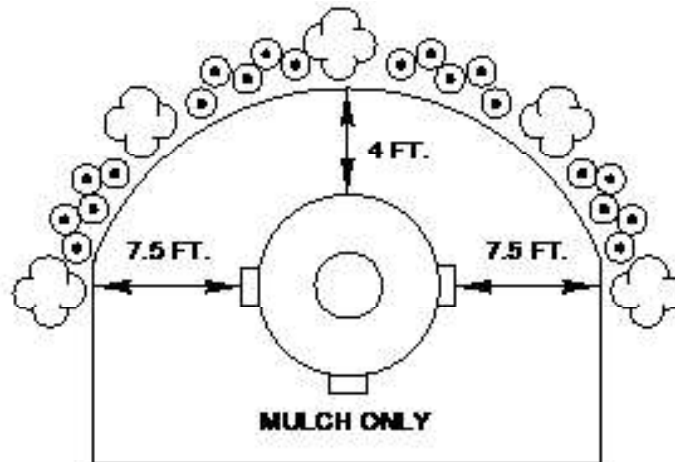
FIRE HYDRANT CLEARANCE DETAIL

THE FLORIDA FIRE PREVENTION CODE NFPA 1 REQUIRES THAT FIRE HYDRANTS BE KEPT ACCESSIBLE TO THE FIRE DEPARTMENTS AT ALL TIMES. "NO PERSON SHALL PLACE OR KEEP ANY POST, FENCES, VEHICLES, GROWTH VEGETATION, TRASH OR STORAGE OF ANY OTHER MATERIALS THAT WOULD OBSTRUCT THE HYDRANT AND HINDER OR PREVENT ITS IMMEDIATE USE BY THE FIRE DEPARTMENT PERSONNEL." (FFPC NFPA 1: 18.3.3.1)

CLEARANCE REQUIREMENTS FOR FIRE HYDRANTS ARE SEVEN AND ONE HALF FEET (7 FT. 6 IN.) ON BOTH SIDES OF THE HYDRANT, WITH FOUR FOOT (4 FT.) CLEARANCE TO THE REAR AND NOTHING IN FRONT OF HYDRANT (FFPC NFPA 1: 18.3.4.1)

CLEARANCE REQUIREMENTS FOR FIRE PREVENTION APPLIANCES ARE SEVEN AND ONE HALF FEET (7 FT. 6 IN.) IN FRONT OF AND TO THE SIDES OF THE APPLIANCES. THIS INCLUDES BACK FLOW PREVENTION WITH THE F.D.C. CONNECTIONS (NFPA 1: 18.3.4.2)

THESE CLEARANCES PREVENT DELAYS IN FINDING AND USING FIRE HYDRANTS AND FIRE PROTECTION EQUIPMENT.



CLEARANCE TO STREET

A CLEAR AREA FOR MANEUVERING EQUIPMENT AND FIRE FIGHTING APPARATUS MUST BE MAINTAINED BETWEEN THE STREET AND THE FRONT.

III. Water Meter Detail

WATER METER DETAIL

2.5 FT., OR 30 INCHES, OF CLEARANCE SHOULD BE PROVIDED AROUND THE METER BOX AND BACKFLOW PREVENTION DEVICE.

THE ILLUSTRATION BELOW SHOWS THE ACCEPTABLE LANDSCAPING PLANS FOR METER BOX AND BACKFLOW PREVENTION DEVICES.

