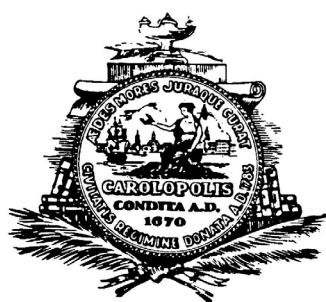
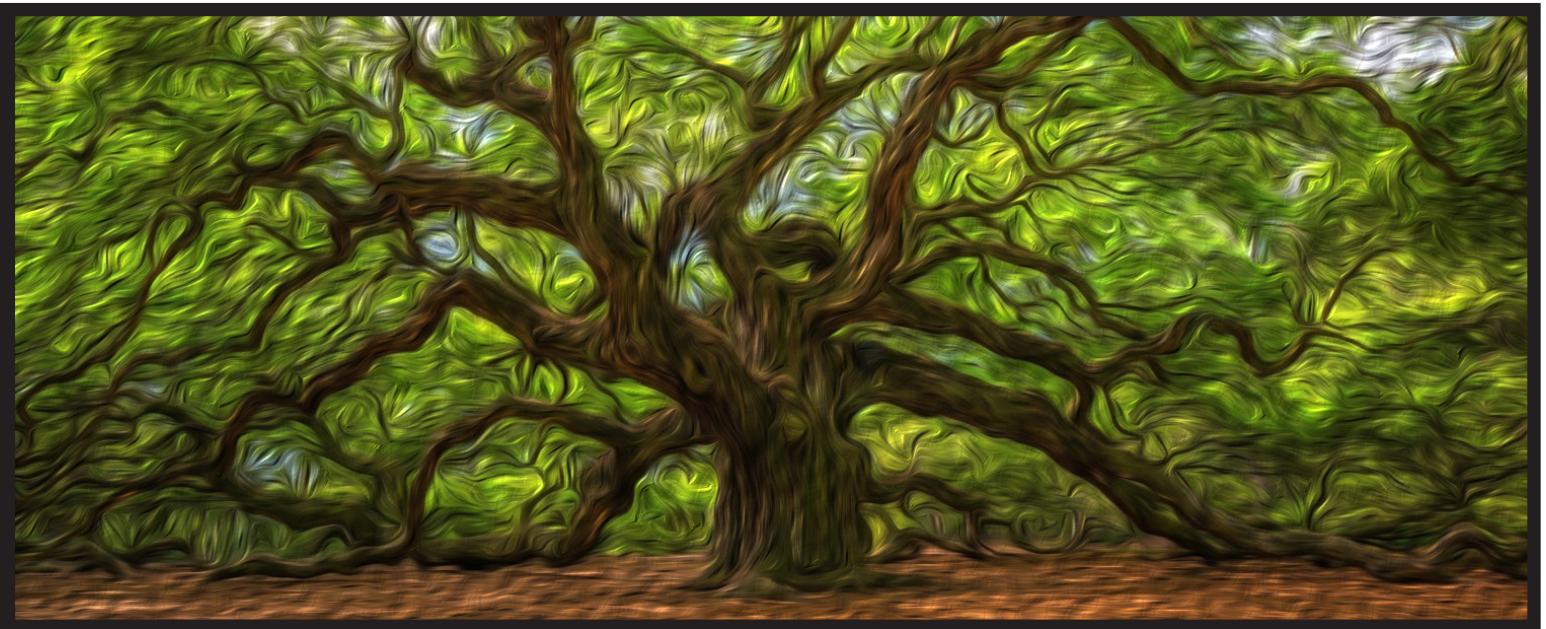


STREET TREE MANUAL



**CITY OF CHARLESTON, SOUTH CAROLINA
DEPARTMENT OF PARKS**

“Someone’s sitting in the shade today because someone planted a tree a long time ago.”
— Warren Buffett

The planting of trees means improved water quality, resulting in less runoff and erosion. This allows more recharging of the ground water supply. Wooded areas help prevent the transport of sediment and chemicals into streams.

- USDA Forest Service

One acre of forest absorbs six tons of carbon dioxide and puts out four tons of oxygen. This is enough to meet the annual needs of 18 people.

- U.S. Department of Agriculture



Mayor Tecklenburg and City of Charleston employees planting a new Street Tree.

Having large trees in yards along streets increases a home's value from 3 percent to 15 percent.

- Wolf, Kathleen L, PhD, University of Washington (2007) City Trees and Property Values. *Arborist News*. 16, 4:34-36

There are about 60- to 200-million spaces along our city streets where trees could be planted. This translates to the potential to absorb 33 million more tons of CO₂ every year, and saving \$4 billion in energy costs.

- National Wildlife Federation

Trees properly placed around buildings can reduce air conditioning needs by 30 percent and can save 20-50 percent in energy used for heating.

- USDA Forest Service

One mature tree can store 50 to 100 gallons of water during a storm.

- Trees To Offset Stormwater Case Study 04: Charleston, South Carolina, 2018

During an average high volume rainfall (a 10-year storm) in the City of Charleston, over 24 hours the city's trees uptake an average of 569 million gallons of water. That's enough water to fill nearly 861 Olympic-size swimming pools!

- Trees To Offset Stormwater Case Study 04: Charleston, South Carolina, 2018

<https://www.charleston-sc.gov/1567/Trees-to-Offset-Stormwater>

TABLE OF CONTENTS

Purpose, Intent, And Scope	3
General Overview of Regulations	4
Ordinances	4-5
Street Tree Removal and Replacement	6
Mitigation for Approved and Unapproved Tree Removals	6-7
Example Mitigation Scenarios	7-8
Tree Protection and Preservation	8
Removal and Replacement of Pavement or Sidewalk	8-9
Promote Longevity of Trees and Pavement	9
Street Tree Population and Selection	10
Street Tree Selection	10-11
Street Tree Spacing and Planting Guidance	12
Street Tree Spacing	12
Planting Stock and Material	13
After Planting Care and Establishment	14-15
Required Statements, Information, and Notes	16
Street Tree Banking and Bonding	17
Street Tree Bank	17
Street Tree Bond	17-19
Appendix	21
Street Tree Protection Barricade Detail	
Street Tree Planting Detail	
Street Tree Staking Detail	
Cobblestone Tree Well Detail	
Palm Tree and Tree Well Detail	
Street Tree Well Detail	
Street Tree Bank Analysis Flow Chart	
Sample Street Tree Banking Analysis Form	
Street Tree Bond Analysis Flow Chart	
Sample Street Tree Bond Analysis Form	
Street Tree Performance Bond Flow Chart	
Sample Street Tree Bonding Agreement	
Sample Warranty Agreement for Street Trees With Bond	
Web Links	



Charleston Street Tree planting from the 1890's.

PURPOSE, INTENT, AND SCOPE

Residents and visitors of Charleston have enjoyed its streets lined with majestic trees for centuries. Indeed, Charleston's stately street trees are as much a part of Charleston's proud heritage as the historic streets and public spaces they shade. All trees proposed and growing within public places are considered to be city Street Trees.

Trees offer many practical advantages by their biological processes. All trees, young and old, process carbon dioxide and other pollutants, and then release oxygen into the atmosphere. Trees consume large amounts of water daily, helping to lessen the burden on our stormwater drainage systems. Trees cool the built environment, especially in urban contexts.

Street Trees that are well-planned and properly planted contribute immeasurably to the health and well-being of Charleston's public spaces, while also improving the local ecosystem, and reducing energy use. To ensure the positive effects, it is essential to account for the mature size and shape of the tree in the layout of the streetscape and follow installation guidelines. Smart decisions early on ensure the health and viability of a tree as it matures.

Trees create a sense of place and character for our public spaces and streets. Healthy trees are aesthetically pleasing and increase property values. Well-maintained trees reflect both the health of the urban forest and the quality of life in Charleston. Mature trees, especially, have a measurable dollar value. All neighborhoods, parks, and commercial properties benefit from the existence of well-planned and maintained trees.

This manual is designed for developers, consultants, tree service providers, contractors, residential property owners, and others who are planning to work on, near, or around Street Trees. This manual is for accompaniment and clarification purposes as an applicant navigates the TRC process and does not override any directive provided by the City of Charleston Technical Review Committee Procedure Manual.



Street Tree planting in a new Charleston development.

GENERAL OVERVIEW OF REGULATIONS

The management of street trees is handled through the City of Charleston Department of Parks (“Parks”). Parks administers the street tree program and performs other vital street tree related activities such as: permitting the planting, removal, cutting, pruning, protection and planning of trees within the public realm and rights-of-way. Through its participation in the technical review process with the City of Charleston Technical Review Committee, Parks addresses the design, development, construction, and installation of street trees. Sole authority to regulate the removal, location, species selection, and implementation of Street Trees rests with Parks.

RELEVANT ORDINANCES

CODE OF ORDINANCES:

Sec. 22-51. Permit required to plant Street Trees.

No shade or ornamental tree or shrub shall be planted in any of the public right-of-ways or easements of the city until such tree or shrub shall have been first approved by the director of the Department of Parks and a permit therefore be granted by the Director of the Department of Parks.

Sec. 22-52. Street Tree permit approvals.

Approved and permitted shade trees, ornamental trees, and shrubs shall be planted at the permittee's expense and approvals shall be based upon the species and cultivar of the tree, the structure of the tree to be planted, the distance apart, and the distance from the edge of pavement, asphalt, or sidewalk as set forth in the City of Charleston's Street Tree Manual.

Sec. 22-53. Permit required to remove, cut, or prune tree.

No person shall, without written permission of the director of the Department of Parks, cut, prune, break, climb, injure, or remove any tree or ornamental shrub located in a public right-of-way or easement of the city or on public property. For trees removed unlawfully, without approval, the Director of the Department of Parks is authorized to grant after-the-fact approval, and require mitigation in accordance with the City of Charleston's Street Tree Manual.

Sec. 22-54. Permit required to remove devices protecting trees.

No person shall, without written permission of the Director of the Department of Parks, injure, misuse, or remove any device placed to protect a tree located in a public right-of-way or easement of the city or on public property.

Sec. 22-55. Permit required to place stones impeding passage of water to trees.

No person shall, without the written permission of the Director of the Department of Parks, place or maintain upon the ground in a public right-of-way or easement of the city or on public property, stone, cement, or other substance which shall impede the free passage of water and air to the roots of any tree located in the public right-of-way or easement of the city or on public property.

Sec. 22-56. Protection of trees during building construction.

In the erection or repair of any building or structure the owner thereof shall place such guards around all the nearby trees in the public right-of-way and easements of the city and on public property as shall effectually prevent injury, as directed by the Director of the Department of Parks.

ZONING ORDINANCE:

Sec. 54-831e. Street Trees.

Within all new developments or subdivisions, all new thoroughfares, excluding alleys, shall be planted with Street Trees in accordance with the following requirements:

- 1. Street Tree species selection, size, location, and spacing shall require approval of the Department of Parks, pursuant to the City of Charleston Street Tree Manual.*
- 2. Street Trees to be planted within streets rights-of-way shall be shown on Street Tree plans and specifications submitted with road construction documents and site plans. The plans and specifications shall satisfy the requirements of the City of Charleston Street Tree Manual.*
- 3. Extensions of existing public rights-of-way with Street Trees shall require the planting of Street Trees.*



Meeting Street Tree planting from the late 1800's.

STREET TREE REMOVAL AND REPLACEMENT

Street Trees provide numerous benefits to Charleston including, but not limited to, filtering air pollution, increasing dust filtration, reducing noise, heat and glare, preventing soil erosion, reducing storm runoff, improving surface drainage, and adding beauty and history to the surrounding landscape. It is for these reasons that the City of Charleston promotes the protection of existing trees.

A Street Tree must be protected and preserved through the technical review plan review process, unless Parks has specifically approved its removal. The removal of existing Street Trees requires mitigation. This mitigation is also required for all trees within the right-of-way. Parks, in its sole discretion, may provide relief from mitigation requirements based on the following circumstances: (1) the tree is dead; (2) the tree is deemed unhealthy; (3) the tree is deemed an unwarranted species; (4) the tree is located underneath a power line or an unfit location. On any given occasion a tree is proposed for removal, Parks may require an ISA Certified Arborist Report to support the need for removal.

Street Trees that are removed must be replaced with the same species, or another species that provides comparable or greater canopy coverage at maturity, provided the planting location can support the replacement. **Removal of a Street Tree without a permit or without replacement is a violation of City ordinance and subject to penalties.**

Mitigation for Approved and Unapproved Tree Removals

The City of Charleston has time and money invested in our large Street Tree population. Street Trees that are under review for removal will be subject to mitigation costs in most circumstances. In addition to mitigation costs, Parks may assess the cost for removal and stump grinding to the party requesting removal.

Mitigation Calculation: Diameter Breast Height (inches) (DBH) X \$275.00 = Mitigation Cost
Diameter breast height is 4.5 ft above the ground. This mitigation cost is based on the cost of replacement taking into account planting, soil prep, watering, mulching, and maintenance.

Mitigation Deductions: The table below shows how mitigation deductions are calculated based on tree location, health, structure, and species. Numbers indicated are percentage deductions of the final monetary contribution of mitigation. Additional consideration is given for trees under overhead utility lines. A tree that has no defects or deductions will pay the full mitigation cost if the removal is permitted.

MITIGATION TABLE

TREE CONDITION	LOCATION	SPECIES	STRUCTURE	HEALTH
GOOD	0	0	0	0
FAIR	15	15	10	10
POOR	30*	30	20	20
*OVERHEAD UTILITY		<i>10% Additional Deduction for Overhead Utility Impacted Trees</i>		

*The overhead utility line reduction only counts for large and medium maturing trees (not for small or understory trees (i.e. Crape Myrtles). No deductions can end in amounts over 100% mitigation.

The mitigation table is set up so property owners, developers, consultants, arborists, and city staff can adequately and fairly determine the conditions of a tree proposed for removal.

Mitigation Factors:

Location: The location of a Street Tree is critical for its projected growth. Does a tree have adequate room for growth? Are there man-made conflicts that adversely affect tree performance? Does the tree sit under water during a rain event? Is its canopy in a power line?

Species: This factor focuses on whether or not the tree itself is appropriate. Is the tree an invasive species? Is the tree prone to blight? Does this tree tend to be messy? Is it a large maturing tree under an overhead utility line?

Structure: The structure of a Street Tree refers to the architecture of a tree. Will the tree tear itself apart in a wind storm? Does it have included bark? Is the canopy lop-sided? Does it have a dominant leader?

Health: This mitigation factor relates to the biological development of a tree. Does it have a quality leaf set? Does it have fungi or cankers? Does it have poor leaf density. Health not only looks at a tree's current conditions, but what it's projected conditions are going to be. Will the construction of a tall building block out all the light? Will construction eventually damage a tree? Will branches grow to a point where they will need to be pruned?

Example Mitigation Scenarios

Example A:



12" LIVE OAK

This tree has no major defects, is in good health, has no overhead utility conflicts, has fair structure, and has a good site location.

DEDUCTIONS

Location: 0%
Species: 0%
Structure 10%
Health: 0%
Overhead Utility Conflict: 0%

TOTAL DEDUCTION = 10%

MITIGATION

12" X \$275 = \$3,300
\$3,300 X .10 = \$330 Deduction
\$3,300 - \$330 = \$2970

TOTAL MITIGATION = \$2970.00

Example B:



20" WATER OAK

This tree has some structural defects, is in poor health, has evident overhead utility conflicts, has fair structure, and has a fair site location.

DEDUCTIONS

Location: 15%
Species: 30%
Structure 10%
Health: 20%
Overhead Utility Conflict: 10%

TOTAL DEDUCTION = 85%

MITIGATION

20" X \$275 = \$5,500
\$5,500 X .85 = \$4,675 Deduction
\$5,500 - \$4,675 = \$825

TOTAL MITIGATION = \$825.00

Tree Protection and Preservation

Unless otherwise specifically approved, all Street Trees shall be preserved and protected from incidental impacts, injury, and damage by permitted or non-permitted construction activities in the right-of-way. All protection of Street Trees shall follow the same guidelines as set forth in Section 54-330 of the City of Charleston Zoning Ordinance.

Each Street Tree within a work zone that is to be preserved shall be barricaded, including all unpaved areas of the critical root zone to prevent compaction, grading, or other disturbance. The detailing of Street Tree protection barricades shall be consistent with Section 54-330 of the City of Charleston Zoning Ordinance. See Appendix at the end of this manual for tree protection barricade detail. All tree barricades must be in place prior to any approved demolition or construction activities. Street Trees with open planting strips and all unpaved areas within a Street Tree drip line shall be enclosed with the required protection fencing.

Removal and Replacement of Pavement or Sidewalk

A number of development projects require the removal of existing sidewalks. Especially in the historic districts of Charleston, these sidewalks surround well established Street Trees. Removal of existing pavement over tree roots is often necessary within the critical root zone of a Street Tree. In any case of construction activity within the root zone of a Street Tree, the exposed roots shall be protected from injury. This is achieved through careful removal of pavement.

Once pavement is broken into manageable pieces it can be carefully removed. All equipment must remain on undisturbed pavement and off exposed roots. All base material around roots shall remain intact prior to determining root pruning strategies. These strategies must be determined by Parks in consultation with the on-site arborist of record. In dry and hot conditions, apply untreated wood chips, burlap or other

means of moisture control over the exposed roots within one hour, and keep the area moist until overlay surface is applied. *See Required Notes, page 16.*

Promote Longevity of Trees and Pavement

Charleston is accustomed to the effects of significant root growth and its impacts on sidewalks, walls, streets, and buildings. As new development arises, the chance of conflict between trees and surrounding pavement is ever greater. It is imperative to loosen soils to promote deep rooting and find ways to maximize available soil volume for healthy root development.

When there is oxygen, water, and space under sidewalk pavement, tree roots will grow. The growth of roots under pavement result in lifting or cracking of the pavement. When pavement lifting is excessive, a pedestrian tripping hazard is created. It then becomes a challenge to preserve the tree while continuing to allow pedestrian use of the sidewalk.

The best opportunity of dealing with sidewalk lifting problems is at the time of tree planting or concrete installation. Tree species can be selected to fit the available space. If space is limited, small maturing trees or species known not to damage pavement should be planted. Alternatively, modifications can be made under or next to the pavement to reduce root growth. Modifications that will extend the useful life of sidewalk pavement include installation of root barriers alongside the pavement or installing a root-excluding base beneath the concrete. Root barriers must be at least 18 inches deep and the top must be above the soil and mulch surface to be effective. Base layers that successfully exclude roots include washed coarse gravel (1-1.5 inches diameter, with no fines) and foam insulation boards. A gravel base at least 4 inches is recommended, thicker is better. Gravel is only effective in well drained soils. Foam boards are commonly available from 1 to 2 inches thick. Two 2-inch thick boards can be glued together to provide a 4 inch base for the greatest protection from root growth damage.

The City of Charleston has adopted a standard detail for proposed Street Trees with a surrounding hard-scape application. This detail shall be utilized in the right-of-way for all Street Tree applications. *See Appendix at the end of this manual.*



Typical tree root damage at a sidewalk.

STREET TREE POPULATION AND SELECTION

The Street Tree population in Charleston is as historic and diverse as its citizens. All Street Trees provide specific aesthetic, human health, environmental and economic benefits. The Street Tree population in Charleston has evolved by cycles of planting, growth, death, removal, and replacement.

Charleston streets are known for fabulous Live Oak canopies, tall Palmettos and colorful Crape Myrtles. These Street Trees have proven their effectiveness, ability to adapt to harsh conditions and survive years of impact from nature and man. Just beyond the city urban limits are forests of tree species that over time have adapted (via aid from nature or man) for suitable use in local streetscapes. For a number of reasons, diversity in Street Trees is important to the survivability of all Street Trees. As Charleston continues to grow, the Street Tree population must adapt to the conditions presented.

In general, no one species should account for more than 10% of the entire population. Further, no one genus should account for more than 20% of the total population. We encourage developers to select species that perform well as Street Trees, yet are underrepresented in the overall Street Tree inventory. Live Oaks, Crape Myrtles, and Palmettos will be allowed, but they should not represent the majority of new streetscape trees.

Street Tree Selection

Parks is willing to consider any species for approval except for those shown on the unapproved Street Tree list. For trees listed on the conditionally approved list, approvals are granted by Parks on a case-by-case basis.

Commonly Approved Street Trees Found in Charleston

Common Name	Botanical Name
Live Oak	<i>Quercus virginiana</i>
Overcup Oak	<i>Quercus lyrata</i>
Pin Oak	<i>Quercus palustris</i>
Nuttall Oak	<i>Quercus texana</i>
Sawtooth Oak	<i>Quercus acutissima</i>
Shumard Oak	<i>Quercus shumardii</i>
Southern Red Oak	<i>Quercus falcata</i>
Crape Myrtle	<i>Lagerstroemia indica</i>
Cabbage Palmetto	<i>Sabal Palmetto</i>
Chinese Pistache	<i>Pistacia chinensis</i>
Sweetbay Magnolia	<i>Magnolia virginiana</i>
Blackgum	<i>Nyssa sylvatica</i>
Chinese Fringetree	<i>Chionanthus retusus</i>
American Hornbeam	<i>Carpinus caroliniana</i>
Trident Maple	<i>Acer buergerianum</i>
Eagleston Holly	<i>Ilex x attenuata 'Eagleston'</i>
Dahoon Holly	<i>Ilex cassine</i>
Savannah Holly	<i>Ilex x 'Savannah'</i>

Conditionally Approved List

Common Name	Botanical Name
Tulip Poplar	<i>Liriodendron tulipifera</i>
American Sycamore	<i>Platanus occidentalis</i>
London Planetree	<i>Platanus x acerifolia</i>
Bald Cypress	<i>Taxodium distichum</i>
Chinese Elm	<i>Ulmus parvifolia</i>

Unapproved List

Common Name	Botanical Name
Bradford Pear	<i>Pyrus calleryana 'Bradford'</i>
Popcorn Tree	<i>Carya illinoinensis</i>
Pine	<i>Pinus sp.</i>
Red Maple	<i>Acer rubrum</i>
Sweet Gum (fruiting or fruitless)	<i>Liquidambar styraciflua</i>
Water Oak	<i>Quercus nigra</i>
Redbud	<i>Cercis canadensis</i>



Pruning of Street Trees under power line.

STREET TREE SPACING AND PLANTING GUIDANCE

Street Tree species selection must take into account existing and proposed utilities, hardscape elements, as well as the minimum planting space necessary for each species. Street trees shall be selected and planted appropriately in order to minimize conflict in public spaces.

Spacing of Street Trees is determined on a number of circumstances and there is no set required vertical and lateral clearance. In light of this, there are some typical clearances that might be applied to the decision regarding the approved location of Street Trees.

Vertical Clearances: Tree Canopy Above Surfaces

From	To	Standard Clearance (Distance)
Sidewalk	Any horizontal projection over a surface	6 - 8 Feet
Roadway	Tree limbs	12 - 14 Feet
Bike Path	Any horizontal projection over a surface	8 - 10 Feet

Trees with a mature height of greater than 15' are prohibited from planting under distribution power lines. No large canopy tree should ever be planted under an overhead utility line.

Lateral Clearances: Tree Planting Adjacent To Other Infrastructure

From	To	Standard Clearance (Distance)
Tree Centerline	Face of curb	3 - 4 Feet
Tree Centerline	Sidewalk or sidewalk landing	2 - 3 Feet
Tree Centerline	Driveway edge	6 - 7 Feet
Tree Centerline	Edge of decorative streetlight pole	15 - 20 Feet
Tree Centerline	Edge of fire hydrants	5 Feet
Tree Centerline	Edge of utility poles	10 Feet
Tree Centerline	Underground utilities	3 - 5 Feet
Tree Centerline	Roadway edge where no curb exists	10 Feet

Street Tree Spacing

Tree spacing is based largely on crown spread, understanding tree species growth habits, and surrounding items located within the planting area.

General Spacing by Canopy Size

Large Tree	40'+ Canopy	
30' Minimum	60' Maximum	45' Preferred
Medium Tree	15' to 40' Canopy	
15' Minimum	40' Maximum	30' Preferred
Small Tree	Less than 15' Canopy	
15' Minimum	25' Maximum	15' Preferred

Small and columnar trees should be planted only if the space is limited. Spacing for columnar varieties may be spaced more closely upon approval by Parks.

Planting Stock and Material

All trees approved for the right-of-way shall meet ANLA Nursery Stock Standards, to provide root and canopy development to support healthy, vigorous growth with natural resistance against disease and/or pest infestation. Trees with broken or inappropriately pruned tops, injured trunks, or branch damage that cannot be corrected by minor pruning are not suitable as Street Trees. For more information on industry standards, and how to select quality trees from local suppliers, see the additional resources links at the end of this manual.

Soil amendments such as compost or other soil conditioners are typically included as a standard for construction projects that construct new planting strips. Soil amendment is not required nor recommended for Street Tree installations in existing planting strips with well-developed soil and appropriate site and soil properties for drainage. Soil amendments in the backfill do not reduce the watering requirements.

Standard tree planting pits should be excavated to a depth equal to the depth of the rootball with diameter of planting hole a minimum of 24 inches greater than the root ball diameter. Excavated native soil should be placed as backfill free of debris, weeds, sod and rocks larger than 1 inch.

Trees should be handled to ensure protection and full support under the root ball, placed with the root crown two inches above adjacent curb and sidewalk surfaces, and oriented to align structural branches for optimum compatibility with buildings and adjacent street/sidewalk clearances. It is imperative that twine, burlap and wire baskets be removed to expose the top 2/3 of the root ball. Full removal of twine, burlap and wire baskets is preferred. Lack of this removal/treatment will result in automatic replacement of tree by developer or contractor.



Street Tree planting in a new Charleston development.

All other containers, grow bags and materials used in the commercial production of nursery stock must be removed entirely from the root ball. Roots should be pruned, loosened and/or straightened to ensure proper growth and establishment.

2"-3" Premium Dyed Brown Shredded Pine Bark mulch (City of Charleston Parks Department standard) should be placed on top of root ball. Mulch shall not cover the root flare and keep 6" away from the base of any/all tree trunks. The final product should be a uniform coverage and thickness. Any mulch "volcanoes" or excessively placed mulch will not be accepted. The minimum diameter of any mulch ring shall be 4' if possible. NOTE: Proper installation and ongoing management of mulch topdressing is necessary to retain soil moisture and protect trees from damage by lawn maintenance equipment.

Correctly planted trees do not require staking. If staking is deemed to be necessary, the staking shall only remain for one year following installation. All stakes must be removed by the developer after one year. See the additional detailing for approved staking methods at the end of this manual.

Place backfill soil around root ball, lightly compacting the soil with pole or shovel handle to eliminate voids. Construct a watering ring (soil berm at 3"-4"; height x 4" diameter) and water thoroughly to ensure settlement of the backfill material. *See Appendix at the end of this manual.*

After Planting Care and Establishment

Watering is necessary for the establishment and survival of new Street Trees. Newly planted trees, including drought tolerant species, are dependent upon supplemental irrigation until established, typically for two to three years. Monitor and water trees weekly during summer months and especially during drought conditions to ensure adequate watering frequency suited to the tree species and soil conditions. Trees shall be watered at time of installation and throughout the warranty period.

It should be noted that trees are often irrigated up to twenty-one times per week at the nursery. Live Oaks (2.5" caliper) take 12 months to establish roots in the landscape when watered regularly 2-3 times per week. Larger trees take longer. For bare minimum survival, a 2.5" caliper Live Oak planted in the spring needs water twice weekly for approximately 10 weeks, then can survive with average rainfall. You cannot make up for lack of frequency with larger volumes less often. It is better to apply water frequently in the weeks and months immediately after planting, than to apply the same volume over a longer period.

Periods of extreme heat, wind or drought may require more or less water than recommended here. The method and amount that is applied may vary depending upon soil composition, heat, wind, planted in turf or ground cover, periods of abnormal rainfall or in poorly drained soils.



Water bag installation on newly planted Street Tree.

Recommended Watering Schedule

<2" Caliper

2-3 gallons per inch of caliper every day for 1-2 weeks

2-3 gallons per inch of caliper every other day for 1-2 months

2-3 gallons per inch of caliper weekly for two months

Additional watering as needed throughout the first year

<2-4" Caliper

2-3 gallons per inch of caliper every day for 1 month

2-3 gallons per inch of caliper every other day for 2-3 months

2-3 gallons per inch of caliper weekly for two months

Additional watering as needed throughout the first year

<4" Caliper

2-3 gallons per inch of caliper every day for 6 weeks
2-3 gallons per inch of caliper every other day for 5 months
2-3 gallons per inch of caliper weekly until established
Additional watering as needed throughout the first year

Palmettos

Watering is based on the average daily temperatures and soil type at the location. Water trees by flooding saucer and allowing water to perk in and then flood again, or put a hose on slow drip and saturate soil completely.

Temperature

0-55 = no watering needed	55-70 = water one (1) time per week
70-85 = water two (2) times per week	85 - up = water four (4) times per week

Plans for automated irrigation systems shall be submitted at the time of the Technical Review Committee review for approval. Irrigation systems in the right-of-way must receive an encroachment permit from the City of Charleston Public Service Department. Typically, irrigation systems decrease room for root growth in tree wells. For other obvious reasons, irrigation systems within the public right-of-way may create unnecessary maintenance and infrastructure conflicts.



Newly planted City of Charleston Street Tree.

REQUIRED STATEMENTS, INFORMATION AND NOTES

Projects with proposed Street Trees must provide the following information on landscape plans in order to receive TRC Approval from Parks:

1. Guarantee Statement

- Trees 2-3.5" caliper require a one (1) year warranty
- Trees 4-6" caliper require a two (2) year warranty
- Trees 6"+ caliper require a three (3) year warranty
- Palmettos require a two (2) year warranty
- Warranty period begins at written acceptance of street tree installation by Parks

2. Watering Schedule (See Previous Pages)

3. List of Proposed Street Trees (Street Tree Plant Schedule)

The list should be separated from the planting list for private areas. The proposed Street Tree list should include common name, botanical name, quantities, caliper, and other specifications such as: minimum height/spread, root ball type, mulch requirements, remarks, etc.

4. Note - Language must appear exactly as stated below:

"Trees planted in the right-of-way must meet ANLA Nursery Stock Standards, and species selection must be approved by the Department of Parks. The City of Charleston Department of Parks reserves the right to reject any Street Tree deemed to be unacceptable."

5. Street Tree Planting Detail

The Street Tree planting detail for canopy trees located in the back of this manual shall be included on landscape plans.



Street Trees in a Charleston community.

Street Tree Bank

The Street Tree Bank is an account established specifically for Street Tree requirements. Should the developer choose to utilize this instrument; a tree bank analysis shall be submitted for review/approval. Please refer to contact information at the end of this manual. The developer shall pay Parks 100% of the approved estimated cost as determined in the tree bank analysis, at which time, the Street Tree requirements are considered satisfied. The City will then utilize the deposited funds to pay for the Street Tree installation and establishment per the approved plans after the adjacent building construction is completed. Projects will be planted in full blocks when possible, and all projects will be planted within five (5) years of acceptance of the right-of-way regardless of the status of adjacent construction. Parks reserves the right to change Street Tree species depending on the final building product or current information. Changes will be made in consultation with the developer when possible.

Street Tree Bank Analysis

A tree bank analysis is 100% of the estimated cost of the trees, installation, watering, mulching, and staking, if necessary. The analysis shall be based on current market rates for tree species and installation. Parks has the right to request a contractor estimate to back up pricing. The tree bank analysis shall be submitted to Parks for review and approval prior to submitting for a final plat for recording. Please refer to contact information at the end of this manual. Please include the approved Street Tree layout plan with the bank analysis. This plan should include street names, be full size, and drawn to a standard engineering scale. Please allow two (2) weeks for approval. Once approved, a copy of the bank analysis will be sent back to the applicant via email. Please keep this copy for your records. **A copy of the approved tree bank analysis will be required to be submitted to the City of Charleston's Engineering Division when submitting your final plat for recording. Payment in full must be received by Parks prior to final plat recording.**

Street Tree Bonding

If Street Trees are not installed through the Tree Banking process, projects (or project phases) with **10 or more trees must be bonded at 150% of the estimated cost**. This cost shall include the price of the trees, installation of the trees, approved watering method, mulching, and staking, if necessary. Smaller bonds may be considered based on market conditions.

Bonds shall be issued for 24 months (730 days) initially and renewed for up to three (3) additional 12 month periods, as necessary. Street Trees shall be planted during the appropriate season to increase survivability. Trees shall not be planted from **April through September**. Palmettos may be planted throughout the year, pending appropriate watering methods are performed.

Street Tree Bond Analysis

A Street Tree bond analysis is 150% of the estimated cost of the trees, installation, watering, mulching, and staking. The Street Tree bond analysis shall be submitted by the developer or developer's representative to Parks for review and approval prior to submitting a final plat for recording. Please include the approved Street Tree layout plan with the bond analysis. This plan should include Street Tree names, be full size, and drawn to an appropriate engineering scale. Allow two (2) weeks for approval. Once approved, a copy of the bond analysis will be sent back to the applicant via mail, hand delivery, or electronic mail. Please keep a copy for your records. A copy of the approved bond analysis will be required to be submitted to the City of Charleston's Engineering Division when submitting your final plat for recording.

ted to the City of Charleston's Public Service Department when submitting your final plat of recording.

Street Tree Performance Bond Agreement

The developer or developer's representative brings the Street Tree Performance Bond Agreement and Bonding Instrument to Parks for verification against the Street Tree Bond Analysis. Upon approval, the Street Tree Performance Bond Agreement is signed and given back to the Developer. Parks will keep a copy of the Street Tree Performance Bond Agreement and Bonding Instrument for their records. Please allow at least two (2) weeks for this process.

Public Dedication Process

If the developer plans to pursue the public dedication process, then they will bring the executed Street Tree Performance Bond Agreement and Bonding Instrument with them to the City of Charleston Public Service Department, who will submit as a single package to City of Charleston Budget, Finance, Revenue, and Collections (BFRC) for recording upon completion of the dedication process detailed in the Appendix of the Manual. Developers will be provided a copy of the bond paperwork for their records.

No Public Dedication Process

In the event a particular project is required to provide Street Trees but does not require plat dedication, the developer or developer's representative brings the Street Tree Performance Bond Agreement and Bonding Instrument to Parks for verification against the Street Tree Bond Analysis. Upon approval, the Street Tree Performance Bond Agreement is signed and submitted as a single package directly to BFRC for recording upon completion of the dedication process detailed in the Appendix of the Manual. Parks will keep a copy of the Street Tree Bond Agreement and bonding instrument for their records. Another copy will be sent back to the applicant via mail, hand delivery, or electronic mail. Please allow at least two (2) weeks for this process.

Bonding Instrument

A bonding instrument is considered a letter of credit, performance bond, cashier's check, or other financial instrument deemed acceptable to the City of Charleston's Corporation Counsel and BFRC.

Release of Performance Bond

Once the required Street Trees have been installed and the developer or the developer's representative is ready for a formal inspection, Parks must be contacted to conduct a field inspection. A field inspection will be scheduled within two (2) weeks upon notification.

Upon final inspection and acceptance, Parks will notify Legal and BFRC staff that the applicant's obligations have been met. At this time, the bond may be released and the warranty period for the Street Trees will begin. **A Street Tree Warranty Bond must be submitted and approved by Parks prior to the release of the Street Tree Performance Bond.** The developer or the developer's representative is responsible for contacting Parks to schedule inspections for the release of bonds. **All bonds will be released to the original bond holder.**

Warranty Bond

Once the required Street Trees have been approved and the Street Tree Performance Bond has been released, the warranty period shall begin. In order to be placed into the warranty period a Warranty Agreement For Street Trees With Bond is signed and submitted and approved by Parks. A bonding instrument must also be submitted with the warranty agreement. **The bond amount shall be 10% of the bonding analysis subtotal prior to the 150% bond.** A bonding instrument is considered a letter of credit, performance bond, cashier's check, or other financial instrument deemed acceptable to the City of Charleston's Corporation Counsel and BFRC. Upon approval, the Warranty Agreement For Street Trees With Bond is

signed and submitted as a single package directly to BFRC for recording upon completion of the dedication process detailed in the APPENDIX of the Manual. Parks will keep a copy of the Warranty Agreement For Street Trees With Bond and bonding instrument for their records. Another copy will be sent back to the applicant via mail, hand delivery, or electronic mail.

Release of Warranty Bond

Once the required Street Trees have been in the ground for a minimum of one year from initial performance approval, the developer or the developer's representative is responsible for contacting Parks to schedule a final inspection for the release of the warranty bond.

Upon final warranty inspection and acceptance, Parks will notify Corporation Counsel and BFRC the applicant's obligations have been met. At this time, the warranty bond will be released. **All bonds will be released to the original bond holder.**

Trees rejected during this inspection will be replaced by the developer and a new warranty bond for the replaced trees will be required.

Please Note: Due to typical slow growth rate at time of planting, palm trees require a 2-year warranty period.

Notice for Inspections of Installation

Please give the Department of Parks at least a two (2) week notice of anticipated installation date. This period will allow for the Department of Parks to review flagging of tree locations and coordinate with tree installers on potential field issues. Trees that are improperly located and were not flagged out for Department of Parks approval may be relocated at the developer's expense.

Notice of Acceptance or Denial

Parks will notify the developer of acceptance or denial within one (1) week of final inspection. Phases must be complete. If elements of the work are found to be out of compliance with this Street Tree Manual (species, quality, location, etc.) the developer will be notified of the deficiencies in writing. Bonds will not be released until all elements of the work are completed. Upon correction of deficiencies an additional inspection of the work will be required. Partial releases shall be considered if the original bond consists of fifty (50) or more trees. Additionally, entire blocks must be completed for a partial release. No less than 50% of the original bond will be released.

Contact Information:

Rodney H. Porter (Primary)
Sr. Landscape Architect
City of Charleston - Department of Parks
823 Meeting Street
Charleston, SC 29403
porterr@charleston-sc.gov
843.724.7322

F. Clark DeCiantis (Secondary)
Deputy Director
City of Charleston - Department of Parks
823 Meeting Street
Charleston, SC 29403
deciantisf@charleston-sc.gov
843.724.7148



Street Tree planting in a new Charleston development.

Standard Details, Forms, Process Flow Charts, And Links

Street Tree Protection Barricade Detail

Street Tree Planting Detail

Street Tree Staking Detail

Cobblestone Tree Well Detail

Palm Tree and Tree Well Detail

Street Tree Well Detail

Street Tree Bank Analysis Flow Chart

Sample Street Tree Banking Analysis Form

Street Tree Bond Analysis Flow Chart

Sample Street Tree Bond Analysis Form

Street Tree Performance Bond Flow Chart

Sample Street Tree Bonding Agreement

Sample Warranty Agreement for Street Trees With Bond

Web Links

American Nursery & Landscape Association (ANLA)

<https://www.americanhort.org/page/standards>

International Society of Arboriculture

<https://www.isa-arbor.com/>

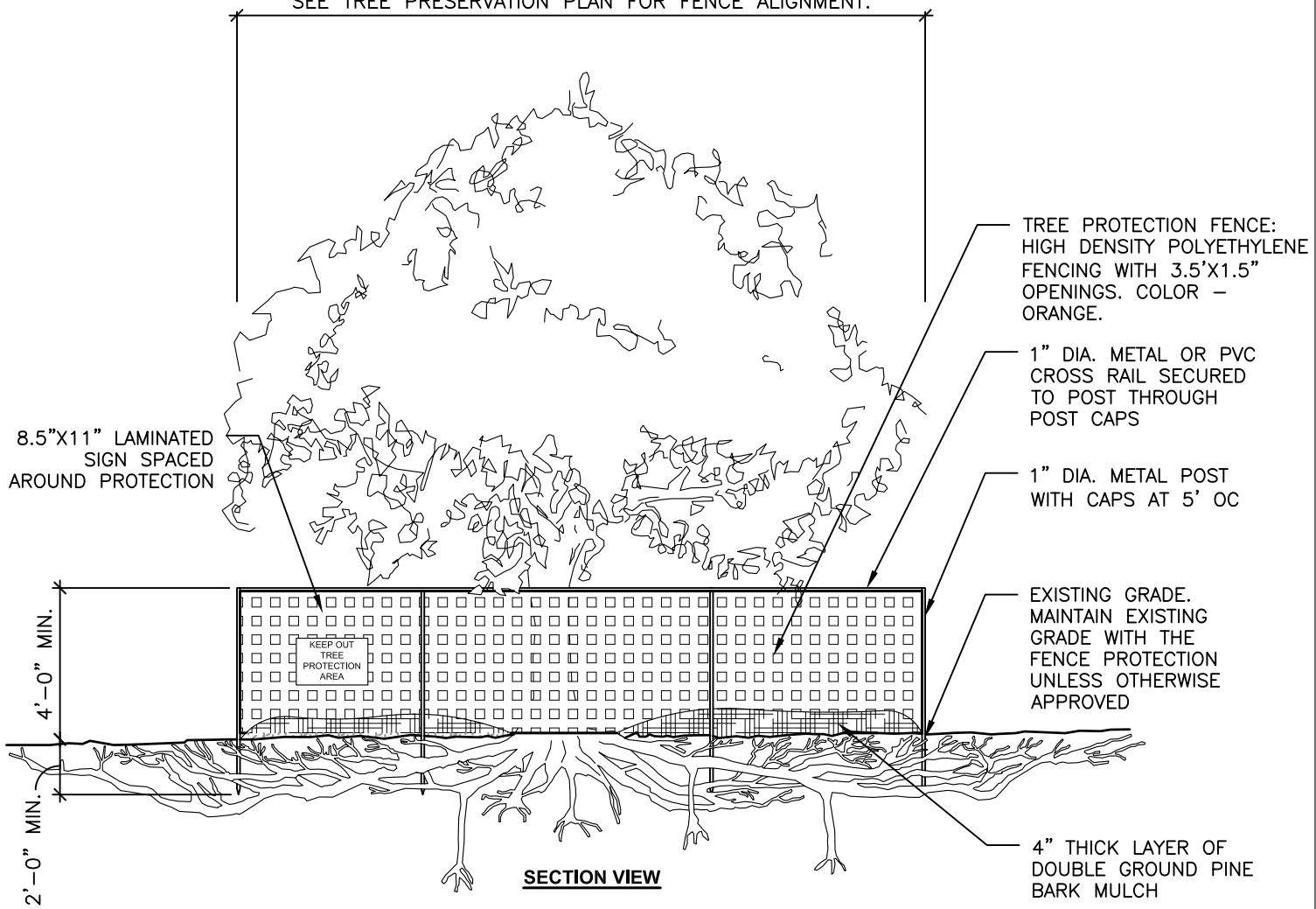
City of Charleston Urban Forestry Division

<https://www.charleston-sc.gov/269/Urban-Forestry-Division>

City of Charleston Street Tree Program

<https://www.charleston-sc.gov/271/Street-Tree-Program>

CROWN DRIP LINE OR OTHER LIMIT OF TREE PROTECTION AREA.
SEE TREE PRESERVATION PLAN FOR FENCE ALIGNMENT.



NOTES

1. SEE SPECIFICATIONS FOR ADDITIONAL TREE PROTECTION REQUIREMENTS.
2. NO PRUNING SHALL BE PERFORMED WITHOUT SPECIFIC CONSULTATION AND APPROVAL BY THE CITY OF CHARLESTON DEPARTMENT OF PARKS. ALL PRUNING MUST BE PERFORMED BY A CERTIFIED ARBORIST.
3. NO EQUIPMENT SHALL OPERATE INSIDE THE PROTECTIVE FENCING FOR ANY REASON INCLUDING FENCE INSTALL.
4. TREE BARRICADES SHALL BE ERECTED AT A MINIMUM DISTANCE FROM THE BASE OF THE PROTECTED TREES AND/OR GRANT TREES ACCORDING TO THE FOLLOWING STANDARDS:
 - FOR PROTECTED TREES 23" DIAMETER BREAST HEIGHT (DBH) OR LESS, PROTECTIVE BARRICADES SHALL BE PLACED A MINIMUM DISTANCE OF TEN FEET FROM THE BASE OF EACH PROTECTED TREE.
 - FOR PROTECTED TREES GREATER THAN 23" DBH AND GRANT TREES, PROTECTIVE BARRICADES SHALL PROVIDE A DIAMETER OF PROTECTION AROUND THE TREE EQUAL IN FEET TO THE DBH OF THE TREE (24" DBH TREE = 24' DIA. BARRICADE).
5. BARRICADES MAY BE ADJUSTED TO ADDRESS EXISTING TREE WELLS, SIDEWALKS, OR OTHER ITEMS. ADJUSTMENTS MUST BE MADE UPON STRICT REVIEW AND APPROVAL FROM THE DEPARTMENT OF PARKS.

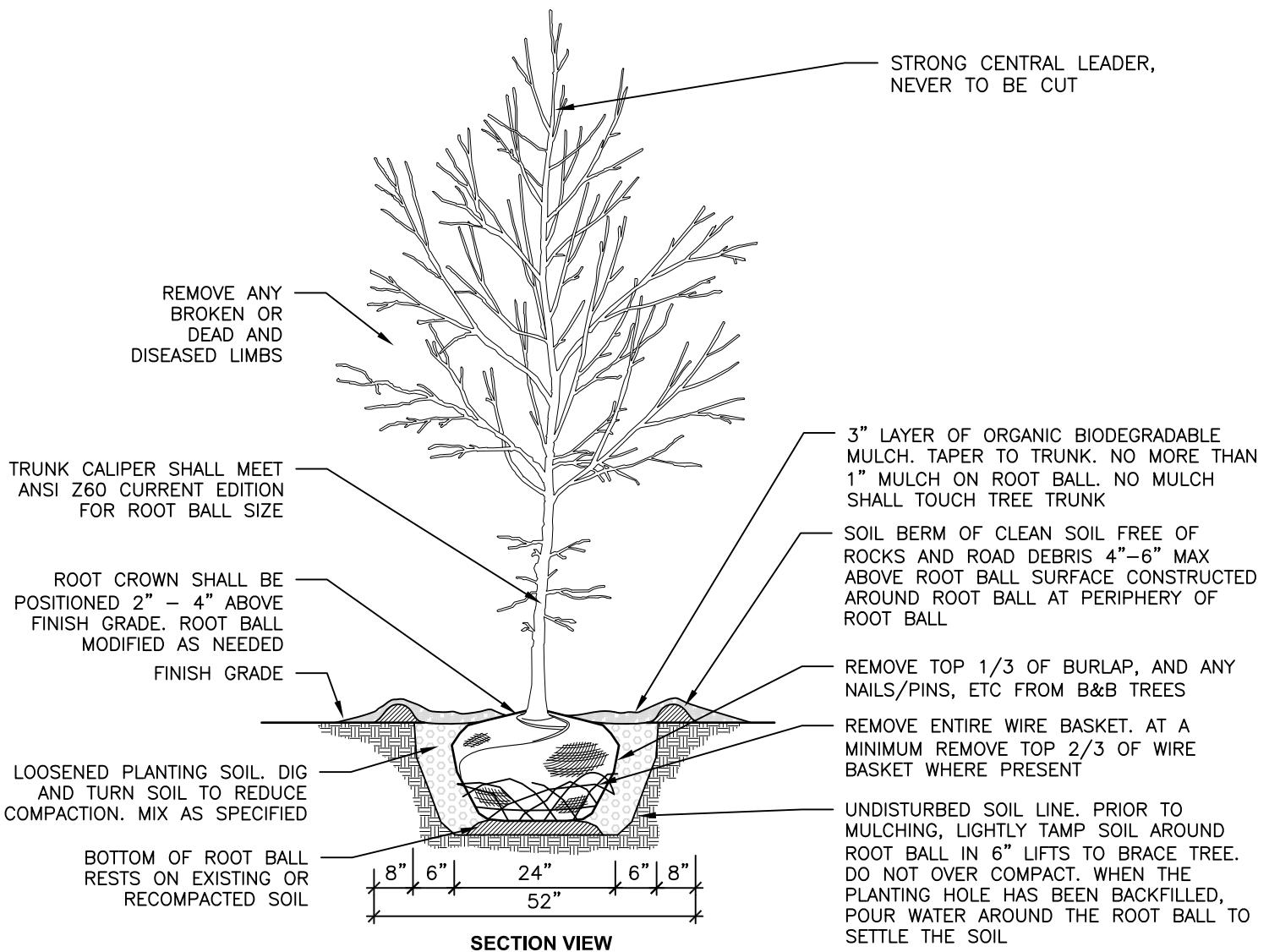
STREET TREE PROTECTION BARRICADE

NO.	REVISED	BY
DRAWN BY: RHP		
CHECKED : FCD		



City of Charleston
Department of Parks
823 Meeting Street, Charleston, SC 29403

APPROVED		
		DIRECTOR
DATE:		
DETAIL NO.:	1	PAGE NO.: 1 OF 1



ALL TREES SHALL MEET AMERICAN STANDARD FOR NURSERY STOCK (ANSI Z60.1)

FOR EXAMPLE: CALIPER HEIGHT (RANGE) MAX. HT. MIN. ROOT BALL DIA. MIN. ROOT BALL DEPTH

2"	12-14'	16'	24"	16"
3"	14-16'	18'	32"	21"

NOTES

1. ALL TREES ARE TO BE NURSERY GROWN, CONTAINER GROWN STOCK FOR PREFERRED FOR NARROW PLANTING WELLS AND VEGETATIVE STRIPS. BALL AND BURLAP (B&B) PREFERRED OTHERWISE.
2. REMOVE ALL TREATED OR PLASTIC-COATED BURLAP, STRAPPING, WIRE OR NYLON TWINE FROM ROOT BALL AND CANOPY. AFTER SETTING IN HOLE, CUT AWAY TOP 2/3 OF WIRE BASKET, IF PRESENT, AND TOP 1/3 OF BURLAP. FOLDING OF WIRE BASKET UNDER SOIL WILL NOT BE ACCEPTED.
3. SOAK PLANT BALL AND PIT IMMEDIATELY AFTER INSTALLATION.
4. INSTALL TOP OF PLANT BALL 2" ABOVE FINISH GRADE.
5. 4" SAUCER WILL BE OUTSIDE OF BACKFILL.
6. NO BACKFILL ALLOWED ON TOP OF ROOT BALL.
7. STAKING IS REQUIRED FOR ALL TREES.
8. CONTRACTOR SHALL REMOVE ALL STAKES, GUYING ETC. AT END OF WARRANTY PERIOD.
9. SEE SPECIFICATIONS FOR OTHER REQUIREMENTS.
10. REMOVE EXCESS SOIL FROM SITE AND DISPOSE OF IN A LEGAL MANNER.
11. RE-SEED UNMULCHED, DISTURBED AREAS.
12. MULCH LAYER SHALL BE MAINTAINED DURING ENTIRE WARRANTY PERIOD AND REPLACED UPON NOTIFICATION BY THE DEPARTMENT OF PARKS.

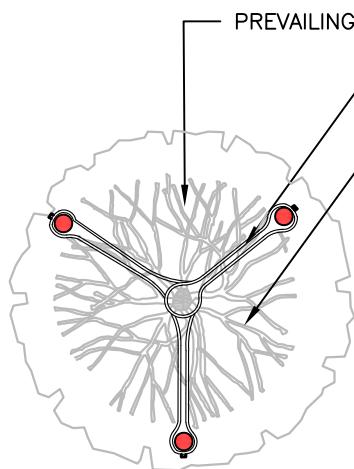
TREE PLANTING DETAIL

NO.	REVISED	BY
DRAWN BY: RHP		
CHECKED : FCD		

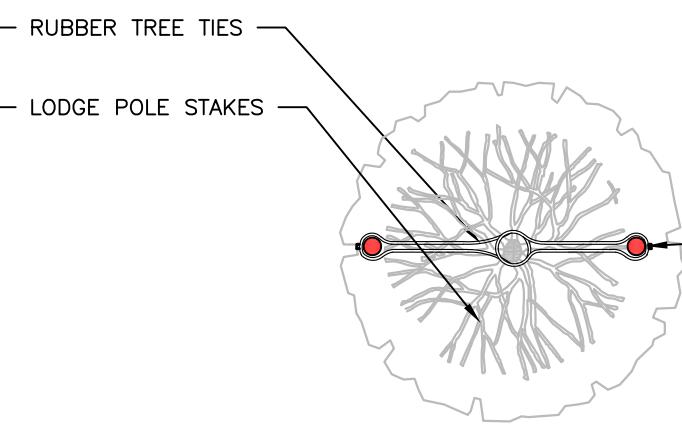


City of Charleston
Department of Parks
823 Meeting Street, Charleston, SC 29403

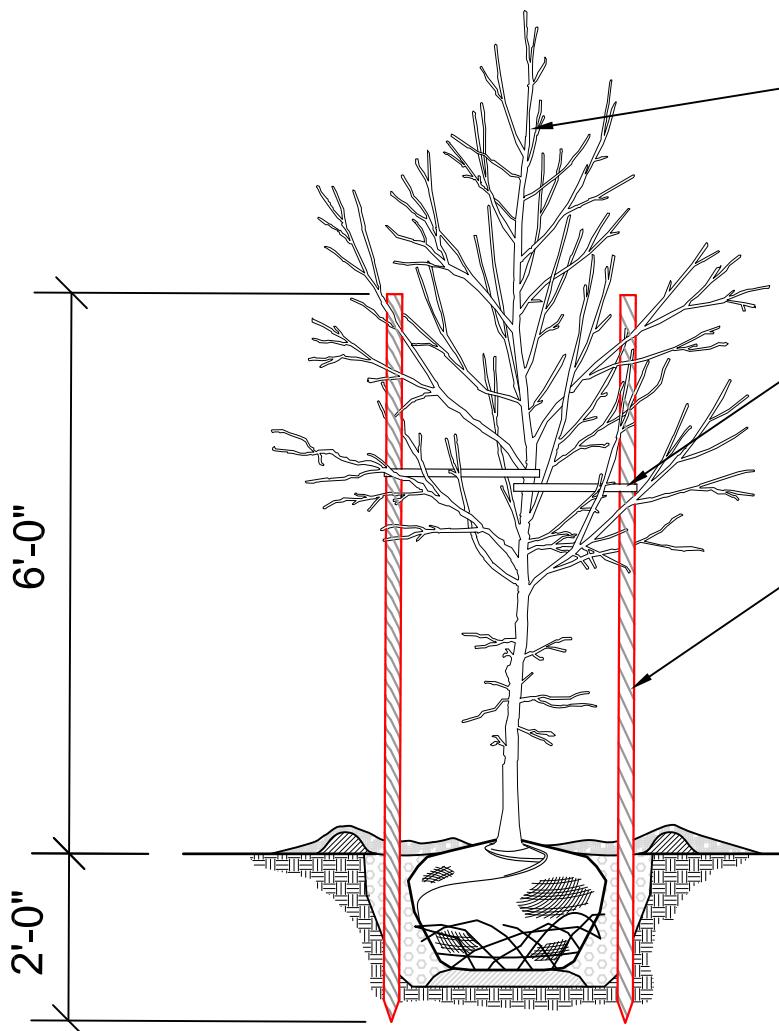
APPROVED		
		DIRECTOR
DATE:		
DETAIL NO.:	1	PAGE NO.: 1 OF 1



PLAN VIEW



PLAN VIEW



REMOVE NURSERY STAKE. IF CENTRAL LEADER NEEDS TO BE STRAIGHTENED OR HELD ERECT, IT IS ACCEPTABLE TO ATTACH A 1/2" X 8' BAMBOO POLE TO THE CENTRAL LEADER AND TRUNK

36" LONG NON-ABRASIVE RUBBER STRAPS

TWO (2) OR THREE (3) INCH LONG LODGE POLE STAKES. INSTALL APPROXIMATELY 2' AWAY FROM THE EDGE OF THE ROOT BALL. STAKE LOCATION SHALL NOT INTERFERE WITH PERMANENT BRANCHES

TREE STAKING DETAIL - POST OPTION

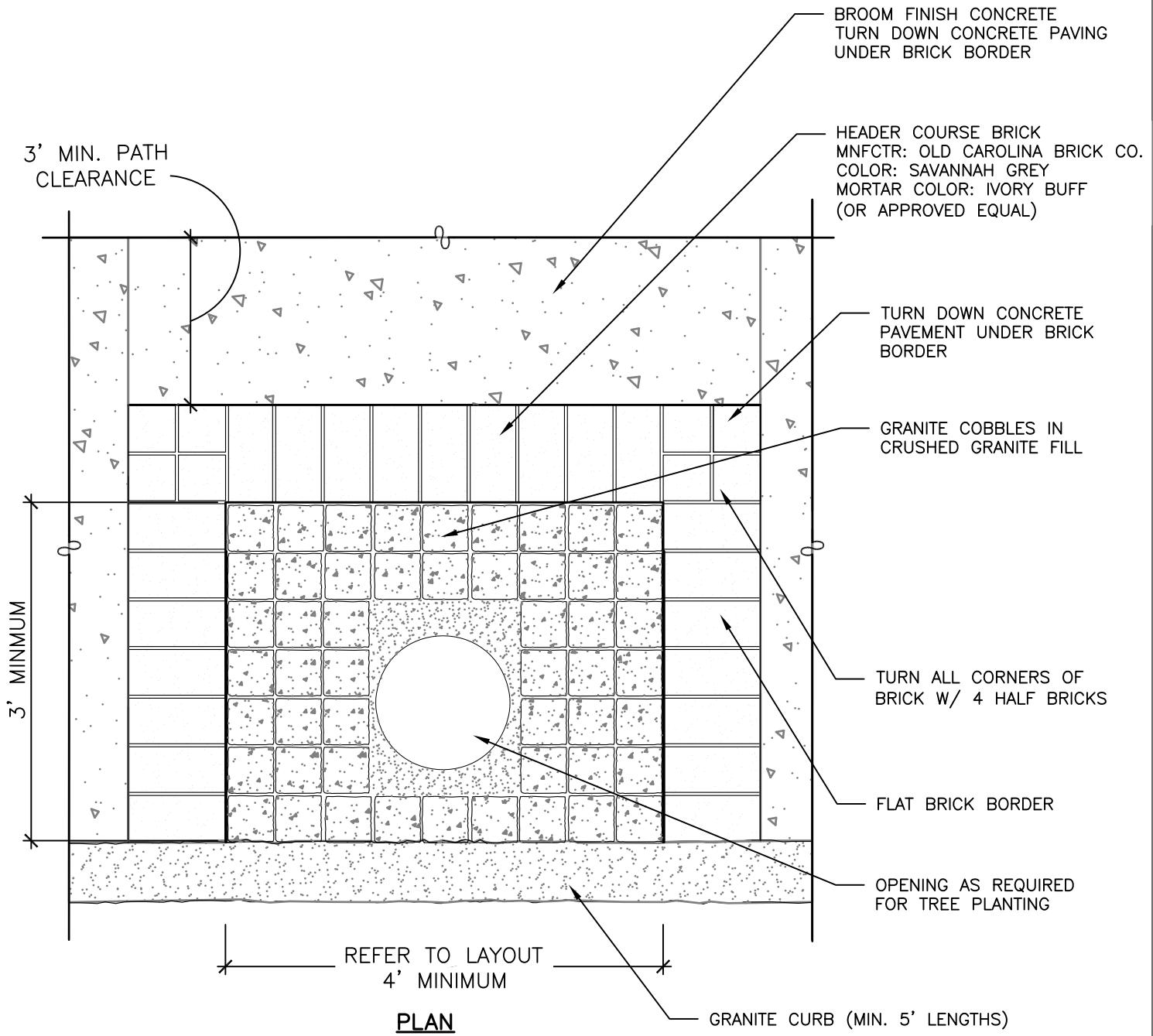
NO.	REVISED	BY

DRAWN BY: RHP
CHECKED : FCD



City of Charleston
Department of Parks
823 Meeting Street, Charleston, SC 29403

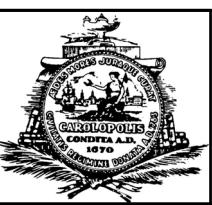
APPROVED		
		DIRECTOR
DATE:		
DETAIL NO.:	1	PAGE NO.: 1 OF 1

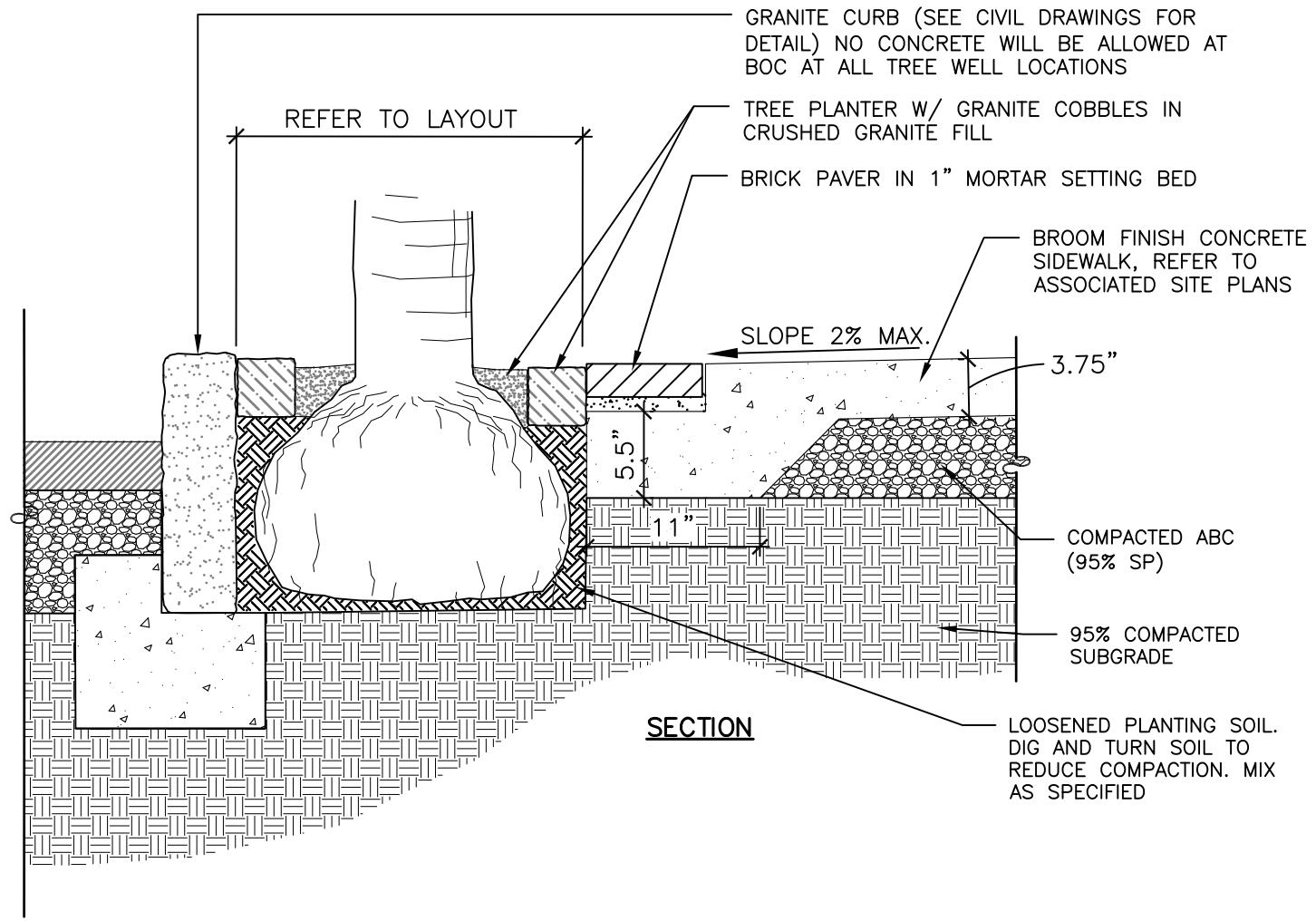


NOTES

- LOCATIONS AND SIZES OF TREE WELLS SHALL BE DETERMINED BY THE CITY OF CHARLESTON DEPARTMENT OF PARKS. SIZES AND LOCATIONS ARE DEPENDENT UPON SPECIES OF TREE, THE INTRUSION OF OVERHEAD WIRES, THE LOCATION OF UTILITIES, THE WIDTH OF SIDEWALK, THE LAYOUT OF ADJACENT ARCHITECTURAL ELEMENTS, SIGHT LINES, AND A VARIETY OF OTHER FACTORS.
- BRICK SHALL BE OLD CAROLINA BRICK. BRICK COLOR SHALL BE SAVANNAH GRAY.
- MORTAR COLOR SHALL BE IVORY BUFF
- CONTRACTOR TO REMOVE, AT BACK OF CURB, CONCRETE GRANITE FOOTING AT NEW TREE WELL LOCATIONS.
- COBBLESTONES SHALL BE 4"X4"X4" TUMBLED SMOOTH GRANITE, BUTTED EDGE TO EDGE ON 1' BED OF GRANITE SCREENINGS, TOPPED WITH ADDITIONAL GRANITE SCREENINGS TO FILL Voids AND COMPACTED.

URBAN COBBLESTONE TREE WELL DETAIL

NO.	REVISED	BY		<i>City of Charleston</i> <i>Department of Parks</i> 823 Meeting Street, Charleston, SC 29403	APPROVED		
DRAWN BY: RHP					DIRECTOR		
CHECKED : FCD					DATE:		
					DETAIL NO.: 1		
					PAGE NO.: 1 OF 1		



NOTES

1. 36" MINIMUM PAVED SIDEWALK AREA WILL BE REQUIRED AT ALL TREE WELLS.
2. CONTRACTOR TO COORDINATE PROPOSED TREE LOCATIONS W/ INSTALLATION OF CURBING SO NO JOINT INTERSECTS WITH TREE WELL.
3. TREE WELL SHALL RECEIVE PREMIUM SHREDDED BROWN PINE MULCH AT A DEPTH OF 3" MIN.
4. CROSS SLOPES SHALL NOT EXCEED 2% SLOPE ON ALL SIDEWALKS WITHIN R.O.W.
5. FULLY REMOVE ALL TREATED OR PLASTIC-COATED BURLAP, STRAPPING, WIRE OR NYLON TWINE FROM ROOT BALL AND CANOPY. FOLDING OF WIRE BASKET UNDER SOIL WILL NOT BE ACCEPTED.
6. SOAK PLANT BALL AND PIT IMMEDIATELY AFTER INSTALLATION.
7. INSTALL TOP OF PLANT BALL 1" BELOW FINISH GRADE.
8. 4" SAUCER WILL BE OUTSIDE OF BACKFILL.
9. NO BACKFILL ALLOWED ON TOP OF ROOT BALL.
10. STAKING IS NOT REQUIRED FOR PALMS BUT ENCOURAGED.
11. CONTRACTOR SHALL REMOVE ALL STAKES, GUYING ETC. AT END OF WARRANTY PERIOD.
12. SEE SPECIFICATIONS FOR OTHER REQUIREMENTS.
13. REMOVE EXCESS SOIL FROM SITE AND DISPOSE OF IN A LEGAL MANNER.
14. RE-SEED UNMULCHED, DISTURBED AREAS.
15. MULCH LAYER SHALL BE MAINTAINED DURING ENTIRE WARRANTY PERIOD AND REPLACED UPON NOTIFICATION BY THE DEPARTMENT OF PARKS.

URBAN PALM TREE WELL DETAIL

NO.	REVISED	BY

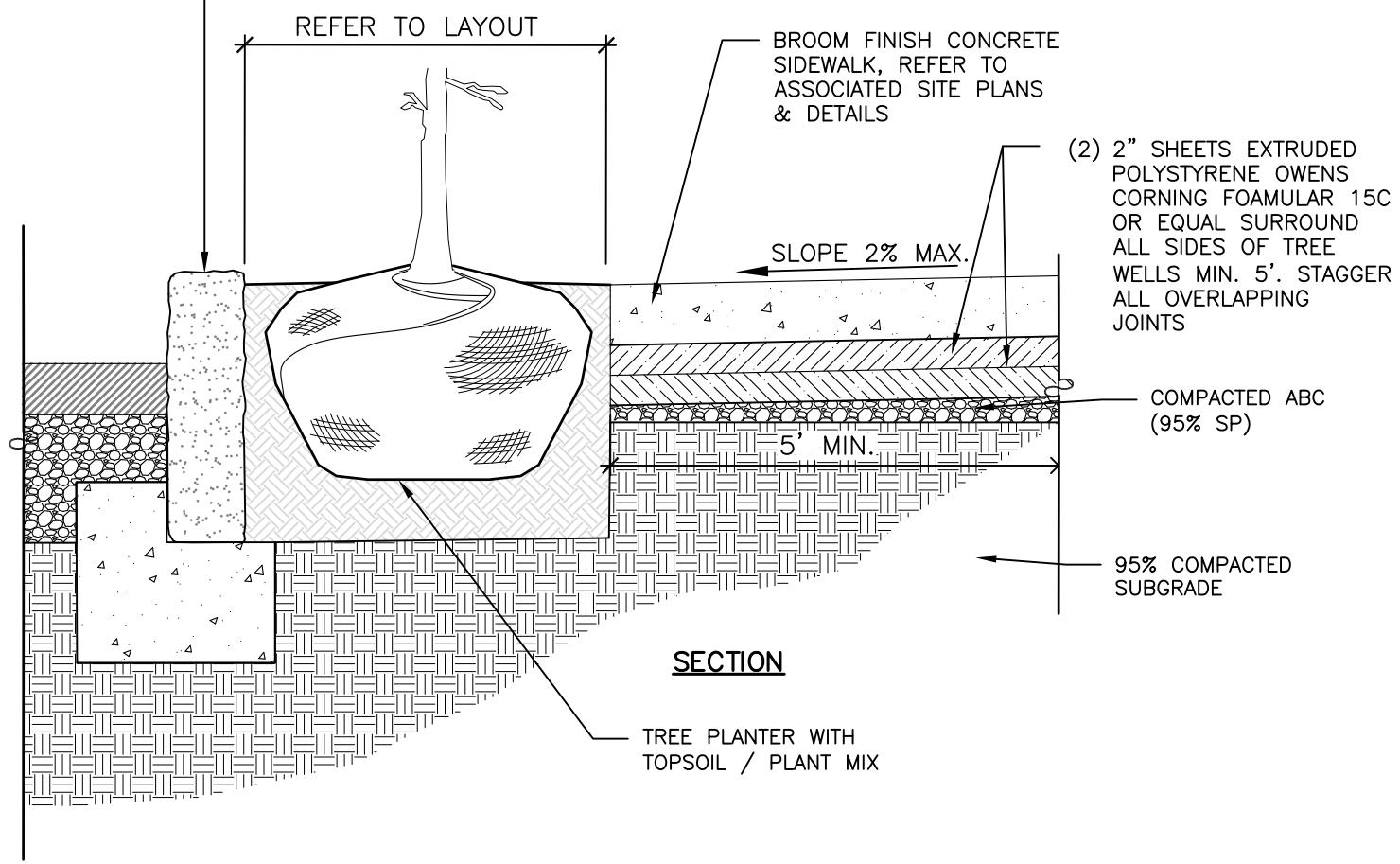
DRAWN BY: RHP
CHECKED : FCD



City of Charleston
Department of Parks
823 Meeting Street, Charleston, SC 29403

APPROVED		
DIRECTOR		
DATE:		
DETAIL NO.:	1	PAGE NO.: 1 OF 1

GRANITE CURB (SEE CIVIL DRAWINGS FOR DETAIL) NO CONCRETE WILL BE ALLOWED AT BOC AT ALL TREE WELL LOCATIONS



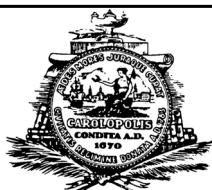
NOTES

1. 36" MINIMUM PAVED SIDEWALK AREA WILL BE REQUIRED AT ALL TREE WELLS.
2. CONTRACTOR TO COORDINATE PROPOSED TREE LOCATIONS W/ INSTALLATION OF CURBING SO NO JOINT INTERSECTS WITH TREE WELL.
3. TREE WELL SHALL RECEIVE PREMIUM SHREDDED BROWN PINE MULCH AT A DEPTH OF 3" MIN.
4. CROSS SLOPES SHALL NOT EXCEED 2% SLOPE ON ALL SIDEWALKS WITHIN R.O.W.
5. FULLY REMOVE ALL TREATED OR PLASTIC-COATED BURLAP, STRAPPING, WIRE OR NYLON TWINE FROM ROOT BALL AND CANOPY. FOLDING OF WIRE BASKET UNDER SOIL WILL NOT BE ACCEPTED.
6. SOAK PLANT BALL AND PIT IMMEDIATELY AFTER INSTALLATION.
7. INSTALL TOP OF PLANT BALL 1" BELOW FINISH GRADE.
8. 4" SAUCER WILL BE OUTSIDE OF BACKFILL.
9. NO BACKFILL ALLOWED ON TOP OF ROOT BALL.
10. STAKING IS NOT REQUIRED FOR PALMS BUT ENCOURAGED.
11. CONTRACTOR SHALL REMOVE ALL STAKES, GUYING ETC. AT END OF WARRANTY PERIOD.
12. SEE SPECIFICATIONS FOR OTHER REQUIREMENTS.
13. REMOVE EXCESS SOIL FROM SITE AND DISPOSE OF IN A LEGAL MANNER.
14. RE-SEED UNMULCHED, DISTURBED AREAS.
15. MULCH LAYER SHALL BE MAINTAINED DURING ENTIRE WARRANTY PERIOD AND REPLACED UPON NOTIFICATION BY THE DEPARTMENT OF PARKS.

TREE WELL & VERGE PLANTING DETAIL

NO.	REVISED	BY

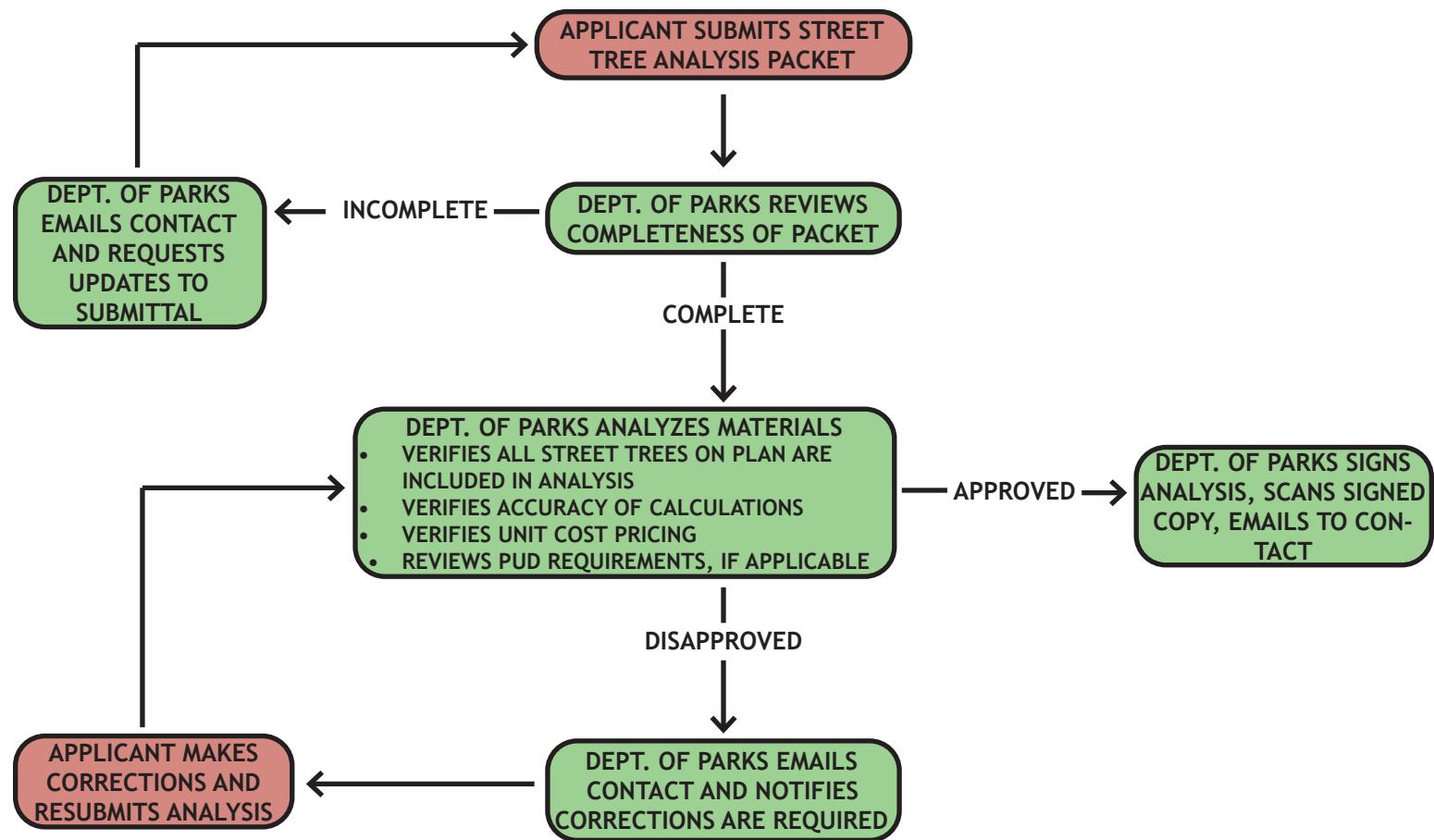
DRAWN BY: RHP
CHECKED : FCD



City of Charleston
Department of Parks
823 Meeting Street, Charleston, SC 29403

APPROVED	
<hr/>	
DIRECTOR	
DATE:	
DETAIL NO.:	PAGE NO.:
1	1 OF 1

Street Tree Bank Analysis Flow Chart



DEVELOPER SUBMITS:

- 1) COVER SHEET
 - NAME OF PROJECT
 - CONTACT PERSON AND CONTACT INFORMATION
 - DEVELOPER'S INFORMATION
- 2) ONE FULL SIZE STREET TREE PLANTING PLAN
 - LOCATION OF STREET TREES
 - LOCATION OF STREET LIGHTS
 - LOCATION OF SIDEWALK
 - LOCATION OF PROPERTY LINES
- 3) BOND ANALYSIS SHEET
 - LISTING BY SPECIES INCLUDING CALIPER & HEIGHT
 - UNIT PRICE FOR EACH TREE
 - COST FOR INSTALLATION
 - COST FOR WATERING
 - COST FOR STAKING AND MULCH

PARKS

APPLICANT

Name of Development
Name of Development Phase
Name of Development Contacts
Address of Development Contacts

00/00/0000

Date Prepared

Summary of Street Tree Banking for
Development X
(Title of Project)

Developer X will be submitting the tree banking for street trees for *Development X, Phase X*. The probable cost for these improvements is contained in the table below and would be the basis for bonding. Tree prices include installation costs. Watering prices are based on unit cost, per tree, per week for 52 weeks and given to us by *X Landscape Company*.

Common Name of Tree	Quantity	Caliper	Height/ Spread	Cost of Tree	Total
Quercus Virginiana/Live Oak	32	2.5"	14-16'	\$ 400.00	\$ 12,800.00
Quercus Shumardii/Shumard Oak	10	2.5"	14-16'	\$ 400.00	\$ 4,000.00
Pine Straw Bales (1 Per Tree)	42			\$ 6.00	\$ 252.00
Installation of Trees and Gator Bags:					\$ 17,052.00

Watering for trees 2 times a week for 12 months (\$5/tree/per week)	\$ 10,920.00
---	--------------

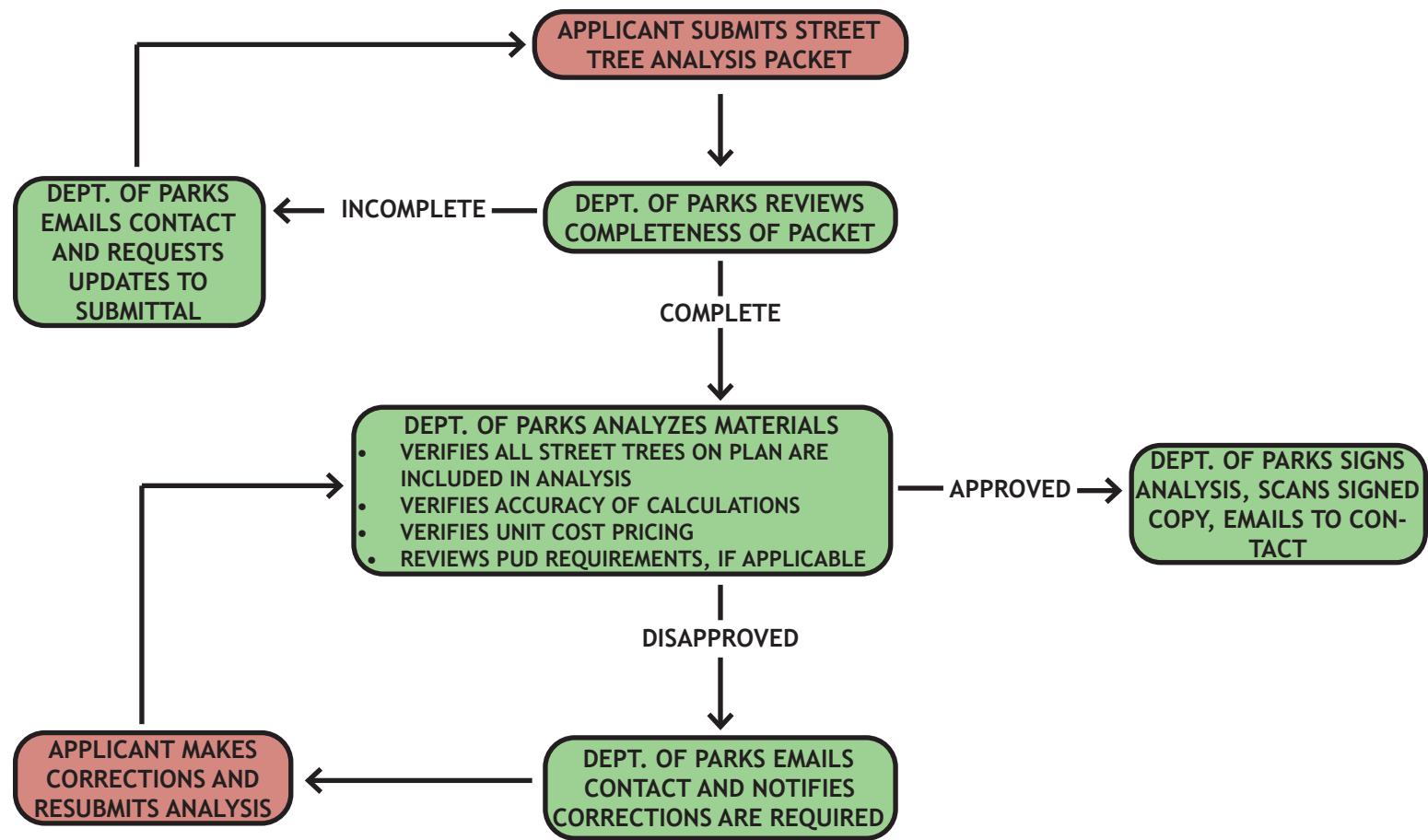
BANK TOTAL:	\$ 27,972.00
--------------------	---------------------

Bank Amount Approved By:

Date: _____

Rodney H. Porter, PLA
Sr. Landscape Architect
City of Charleston, Department of Parks

Street Tree Bond Analysis Flow Chart



DEVELOPER SUBMITS:

- 1) COVER SHEET
 - NAME OF PROJECT
 - CONTACT PERSON AND CONTACT INFORMATION
 - DEVELOPER'S INFORMATION
- 2) ONE FULL SIZE STREET TREE PLANTING PLAN
 - LOCATION OF STREET TREES
 - LOCATION OF STREET LIGHTS
 - LOCATION OF SIDEWALK
 - LOCATION OF PROPERTY LINES
- 3) BOND ANALYSIS SHEET
 - LISTING BY SPECIES INCLUDING CALIPER & HEIGHT
 - UNIT PRICE FOR EACH TREE
 - COST FOR INSTALLATION
 - COST FOR WATERING
 - COST FOR STAKING AND MULCH

PARKS

APPLICANT

Name of Development
Name of Development Phase
Name of Development Contacts
Address of Development Contacts

00/00/0000

Date Prepared

Summary of Street Tree Performance Bond Analysis for
Development X
(Title of Project)

Developer X will be submitting the bond for street trees for *Development X, Phase X*. The probable cost for these improvements is contained in the table below and would be the basis for bonding. Tree prices include installation costs. Watering prices are based on unit cost, per tree, per week for 52 weeks.

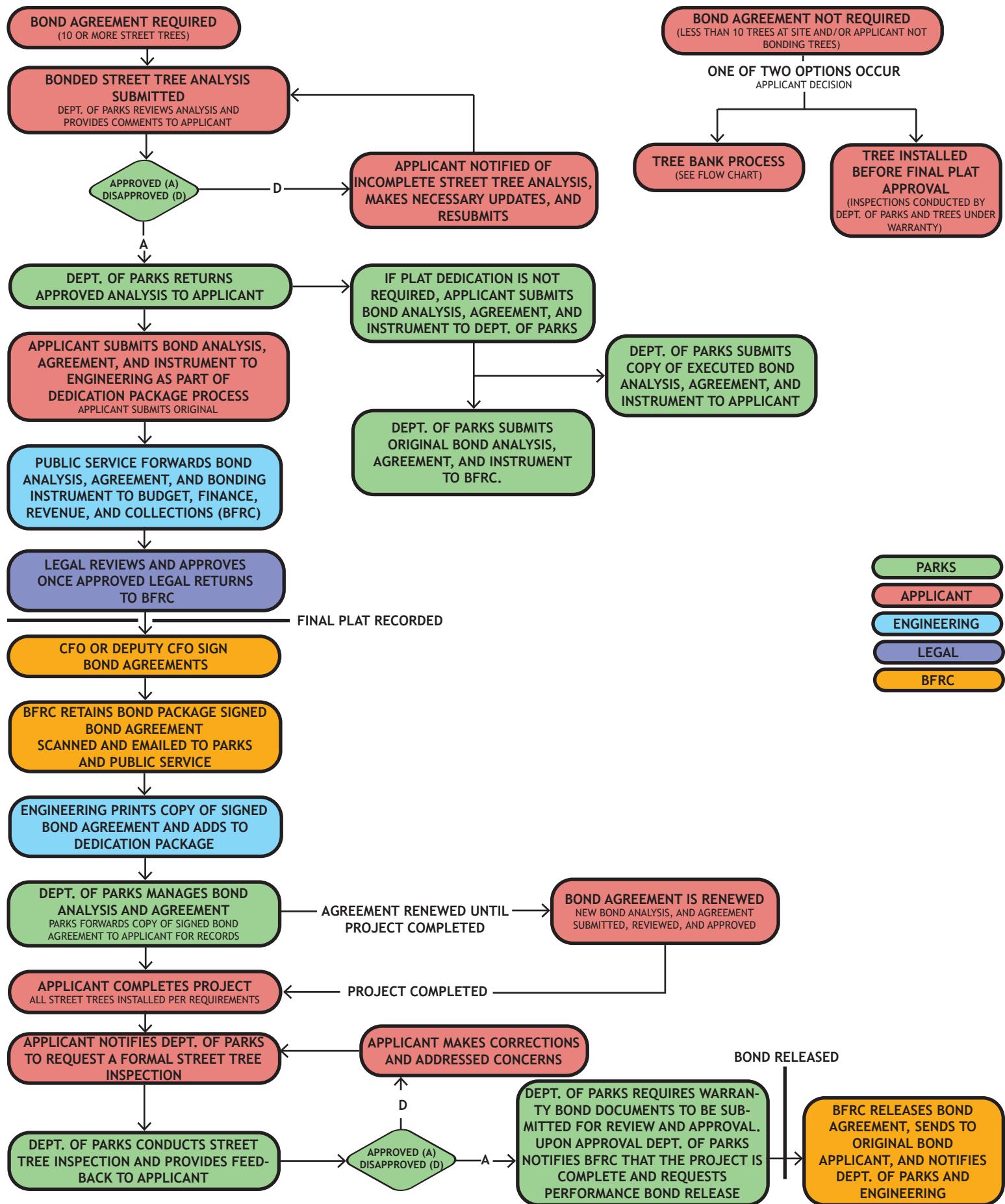
Common Name of Tree	Quantity	Caliper	Height/ Spread	Cost of Tree	Total
Quercus Virginiana/Live Oak	32	2.5"	14-16'	\$ 400.00	\$ 12,800.00
Quercus Shumardii/Shumard Oak	10	2.5"	14-16'	\$ 400.00	\$ 4,000.00
Pine Straw Bales (1 Per Tree)	42			\$ 6.00	\$ 252.00
Installation of Trees and Gator Bags:					\$ 17,052.00
Watering for trees 2 times a week for 12 months (\$5/tree/per week)					\$ 10,920.00
SUBTOTAL:					\$ 27,972.00
TOTAL BOND AMOUNT (150% OF SUBTOTAL):					\$ 41,958.00

Bond Amount Approved By:

Date: _____

Rodney H. Porter, PLA
Sr. Landscape Architect
City of Charleston, Department of Parks

Street Tree Performance Bond Flow Chart



STATE OF SOUTH CAROLINA)
COUNTY OF Charleston)

STREET TREE BONDING AGREEMENT

THIS STREET TREE BONDING AGREEMENT (this "*Agreement*") made and entered into this _____ day of _____, 20____, by and between _____, having a mailing address of _____, (hereinafter the "*Owner*"), and THE CITY OF CHARLESTON, SOUTH CAROLINA (hereinafter the "*City*"), in the state aforesaid.

WHEREAS, the Owner has submitted to the City a subdivision plat entitled "_____", dated _____, 20____, prepared by _____, and recorded in the RMC Office for Charleston County in Plat Book ____, at Page ____ (hereinafter the "*Plat*") of the Owner's project identified as _____

(hereinafter the "*Project*"); and

WHEREAS, as a condition of approval of the aforesaid Plat, the Owner has agreed to post a bond or other adequate security in a form acceptable to the City for the completion of certain street tree improvements required for the Project (hereinafter the "*Bonded Improvements*"); and

NOW, THEREFORE, in consideration of the foregoing and of mutual promises contained in this Agreement, the parties in this Agreement agree as follows:

1. As a condition of approval of the Plat by the City, the Owner hereby agrees to obtain a Street Tree Bond in a form acceptable to the City for the benefit of the City (hereinafter the "*Street Tree Bond*"). Said Street Tree Bond shall contain the following terms:

- a. The amount of the Street Tree Bond shall be _____ Dollars and ____/100 (\$_____), which represents one and one-half (1½) times the estimate of the cost to construct the Bonded Improvements as shown on the Project construction drawings approved by the city engineer and as verified by an independent cost estimate for the construction of the Bonded Improvements prepared by _____, attached hereto and incorporated by reference herein.
- b. The Owner shall authorize the City to draw against the Street Tree Bond upon presentation of a statement signed by an authorized officer of the City that the Owner has failed to construct the Bonded Improvements as approved on the construction drawings for the Project dated _____, 20____, last revisions dated _____, 20____, within 24 month(s) of the date of this Agreement.

2. Upon completion of the Bonded Improvements as shown on the Approved Construction Drawings for the Project, the Owner shall request that the same be inspected by the City. If the inspection by the City verifies that the Bonded Improvements have been completed in accordance with the approved Project construction drawings and the applicable regulations in effect as of the date of the approved construction drawings for the Project, the City shall send notice to the Owner that the conditions of the Street Tree Bond have been satisfied and the Street Tree Bond is to be released to the Owner. In the event the Bonded Improvements have not been properly completed in accordance with the approved Project construction drawings and the applicable regulations in effect as of the date of the approved construction drawings for the Project, the City shall immediately notify the Owner, in writing, specifying what items have not been completed pursuant to the approved Project construction drawings and/or the applicable regulations in effect as of the date of the approved construction drawings for the Project.

3. In the event that it is necessary for the City to complete the Bonded Improvements, the Owner hereby agrees to give the City access to the approved constructions drawings for the Project and to further authorize the City to draw against the Street Tree Bond in accordance with Section 1(b) herein. In such event, the Owner shall cause the Street Tree Bond to be extended by the Surety thereof, if necessary, in order to provide the City with sufficient time in which to construct the Bonded Improvements and draw against the Street Tree Bond in accordance with Section 1(b) herein.

4. Notwithstanding the foregoing, the City reserves the right to issue a stop-work order for the Project and/or withhold the issuance of any certificate of occupancy in the event the Owner has failed to complete the Bonded Improvements in accordance with the terms of this Agreement or extend this Street Tree Bond in accordance with Section 3 herein.

IN WITNESS WHEREOF, the parties have set the Hands and Seals the day and year above written.

WITNESSES:

Witness #1

OWNER

Name:

Witness #2

Date:

WITNESSES:

CITY OF CHARLESTON

Witness #1

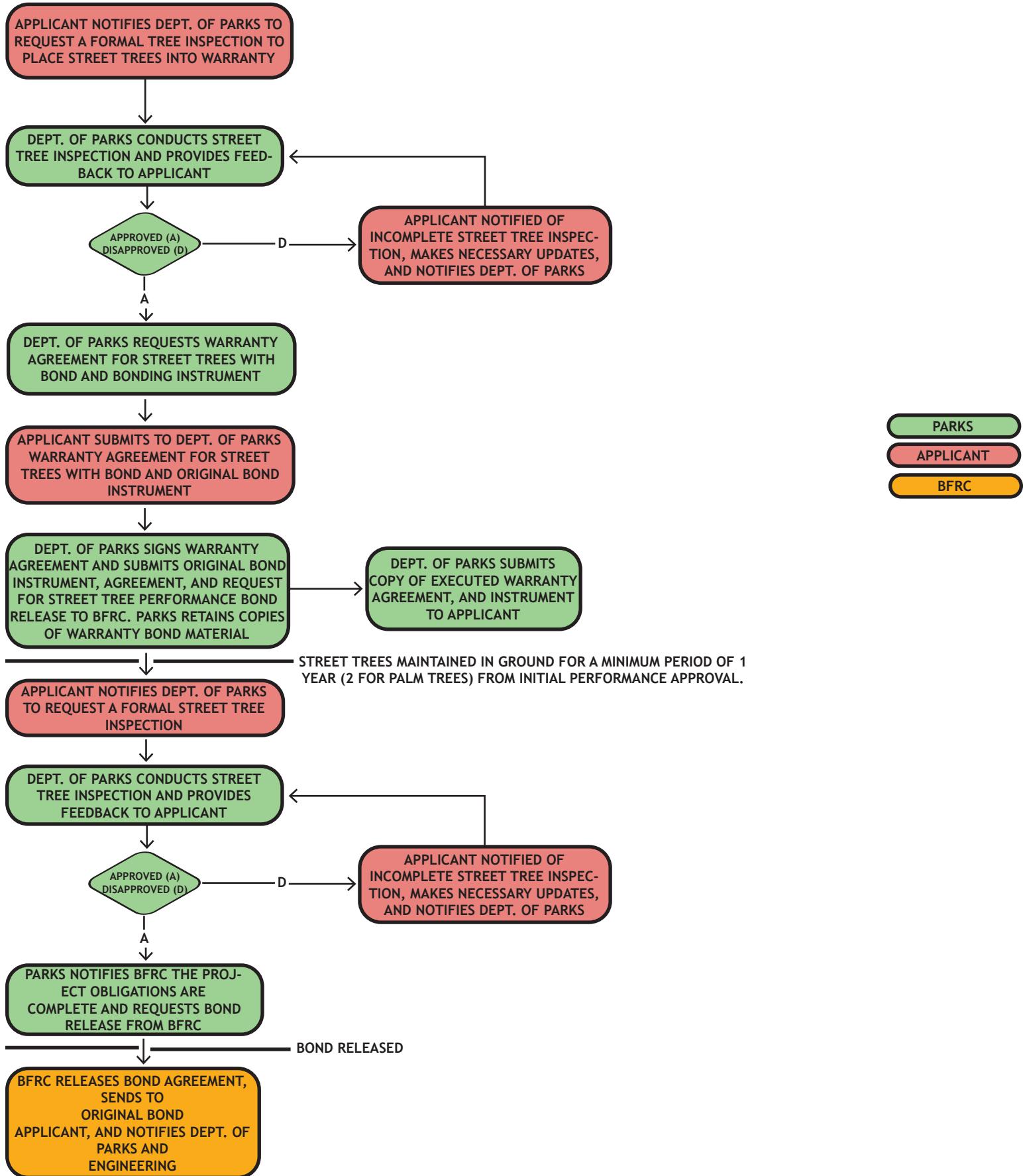
By: _____

Witness #2

Its: _____

Date: _____

Street Tree Warranty Bond Flow Chart



STATE OF SOUTH CAROLINA
COUNTY OF _____

) **WARRANTY
AGREEMENT FOR STREET
TREES WITH BOND**

This Warranty Agreement is made and entered into this _____ day of _____ 20____, by and between the City of Charleston, a municipal corporation organized under the laws of the State of South Carolina (hereinafter referred to as "the City"), and _____ (hereinafter referred to as "Developer") with its principal place of business being

WHEREAS, Developer has undertaken to make certain street tree improvements by planting street trees (hereinafter referred to as the "Improvements") in and for

Development, Improvements more particularly shown on the street tree and lighting plan for

prepared by _____
dated _____ day of _____, 20____ (hereinafter referred to as "Street Tree Plan"); and

WHEREAS, Developer wishes to have the above said Improvements dedicated to the public and accepted by the City for maintenance. These Improvements have been built in accordance with the City's Street Tree Manual, as amended from time to time, and a condition of the City accepting the Improvements for maintenance is that the Developer agrees to assume warranty responsibility for these Improvements for a period of _____ years from the date of acceptance by the City; and

WHEREAS, the City has inspected the Improvements, has approved the Street Tree Plan, and has accepted the public Improvements as shown on the approved Street Tree Plan.

NOW THEREFORE, for and in consideration of having the Improvements accepted by the City, and for other good and sufficient consideration, the receipt of which is hereby acknowledged by the parties hereto, Developer enters into this Agreement with the City, guaranteeing that Developer shall comply with the following requirements regarding the Improvements as follows:

1. Developer warrants that it shall, for a period of _____ years from the date of the acceptance of the above-referenced Improvements by City Council (hereinafter referred to as the "Warranty Period"):
 - A. Take every reasonable precaution to protect the Improvements from damage by the elements or from any cause whatsoever at no cost to the City, and;
 - B. Remove and replace all street trees determined by the City to be diseased, dead, dying or otherwise not in conformance with the City's Street Tree Manual which are or should be discovered during the Warranty Period even if the City performs

repairs, maintenance, removal, and/or replacement due to the defect or defects before the expiration of the ____ year Warranty Period, in which case the Developer shall reimburse the City for its costs incurred therefore and;

- C. Provide and maintain suitable barricades for the Improvements wherever necessary, and;
- D. Save and hold harmless the City, its officers, agents and employees from any and all claims for damage to persons or property or death, including legal fees and costs associated therewith, sustained as a result of any defect or defects in the Improvements or lack of maintenance thereof or any negligent act or omission by the Developer, its employees, agents, contractors and subcontractors arising out of this Warranty Agreement, and;
- E. Save and hold harmless the City, its officers, agents and employees from any and all claims for damage to persons or property or death, including legal fees and costs associated therewith, occurring during any Developer repairs, maintenance, removal, and/or replacement of the Improvements, and;
- F. Developer shall not be responsible for damages to the Improvements caused by utilities or others.

2. If in the sole judgment of the City or its designee, repairs, maintenance, removal, and/or replacement to the above-referenced Improvements become necessary at any time during the Warranty Period or after the Warranty Period if the defect or defects are discovered within the expiration of the ____ year Warranty Period, said repairs, maintenance, removal, and/or replacement shall be made by the Developer at the Developer's expense upon written notice from the City or its designee. Developer shall take out and remove all inferior or defective Improvements and replace the same with good and acceptable trees approved by the City as necessary to bring the Improvements into compliance with the certified Street Tree Plans and the Street Tree Manual following final inspection and preceding the commencement of the ____ year Warranty Period. Failure to remedy any defect in the Improvements as requested by the City or its designee shall extend the Warranty Period until such repairs are completed and accepted by the City. If the City elects to make such repairs, the Developer shall reimburse the City for all expenses associated with such repairs no later than thirty (30) days from demand for reimbursement from the City. Repaired and/or removed and replaced Improvements shall be warranted for a period of ____ years from the date of City's acceptance of the repair and/or removal and replacement of the Improvement(s).

3. If during the ____ year Warranty Period, the City or its designee determines that any of the Improvements, need emergency repairs, maintenance, removal, and/or replacement in order to comply with federal, state or local regulations, or if the City or its designee determines that any Improvements require emergency repairs, maintenance, removal, and/or replacement in order to protect the public health, safety or welfare, then the City or its designee may demand in writing of Developer that such repairs, maintenance, removal, and/or replacement or maintenance be completed within fifteen (15) calendar

days from receipt of such demand notice from the City. Should the Developer fail to complete such repairs, maintenance, removal, and/or replacement of such Improvements within fifteen (15) calendar days of receipt of such demand notice from the City, then the City may perform such emergency repairs, maintenance, removal, and/or replacement to the Improvements and Developer shall be responsible for the costs of any such repairs, maintenance, removal, and/or replacement to the Improvements performed by the City and shall reimburse the City for all expenses associated with such repairs, maintenance, removal, and/or replacement no later than thirty (30) days from receipt of a demand for reimbursement from the City.

4. As a condition of this Agreement, the Developer shall provide a bond, attached hereto and incorporated herein as Exhibit A, in a form acceptable to the City for the benefit of the City (hereinafter the "**Warranty Bond**"). The Warranty Bond shall contain the following terms:
 - A. The amount of the Warranty Bond shall be _____ Dollars and ____/100 (\$0.00), which represents ten percent (10%) of the cost of the constructed Improvements as shown on the Street Tree Plan approved by the City and as verified by an independent cost estimate for the Bonded Improvements prepared by_____, attached hereto and incorporated by reference herein as Exhibit B. The Warranty Bond shall either be provided by a reputable Federal Treasury Department approved bonding company with at least a rating of A minus or in a form acceptable by the City.
 - B. The Developer shall authorize the City to draw against the Warranty Bond upon presentation of a statement signed by an authorized officer of the City that the Developer has failed to maintain or repair the Improvements as required under this Agreement.
 - C. In the event the City performs maintenance or repairs to the Improvements, the Developer hereby agrees to give the City access to the approved Street Tree Plans for the Project and to draw against the Warranty Bond to pay for the necessary repair, maintenance, removal, and/or replacement to the Improvements. If necessary, the Developer shall cause the Warranty Bond to be extended by the Surety of the Warranty Bond, in order to provide the Surety or the City with sufficient time in which to complete the repairs, maintenance, removal, and/or replacement to the Improvements and draw against the Warranty Bond to pay for such repairs, maintenance, removal, and/or replacement in accordance with this Agreement.
5. During the Warranty Period should the cost of the repairs, maintenance, removal, and/or replacement to the Improvements exceed the Warranty Bond, the City may proceed with the repair, maintenance, removal, and/or replacement of the Improvements and subsequently demand such costs in excess of the Warranty Bond be paid by the Developer. Should Developer not pay such costs within thirty (30) calendar days of the City's written demand therefor, the City shall be entitled to recover such costs from the Developer, including attorney's fees and costs, in a court of competent

jurisdiction in Charleston County, South Carolina.

6. The parties hereto shall execute the original agreement with all attached original exhibits.
7. Developer agrees that during the Warranty Period, Developer shall advise the City in writing of any change in its address, contact information or corporate status.
8. Developer assures that it is financially stable, solvent and is fiscally capable of completing any repairs, maintenance, removal, replacement and/or other work to the Improvements that may become necessary pursuant to the terms of this Warranty Agreement.

IN WITNESS WHEREOF, the City of Charleston, South Carolina, and Developer have hereunto set their respective hands and seals the day and year hereinafter set forth.

I, _____, hereby certify that all Improvements being dedicated to the City has been installed in accordance with the Street Tree Manual as approved by the City of Charleston.

WITNESSES:

DEVELOPER / OWNER

Witness #1

Name

Witness #2

Date: _____

WITNESSES:

CITY OF CHARLESTON

Witness #1

By: _____

Witness #2

Its: _____

Date: _____