To: Honorable Mayor and Members of the City Council

From: Councilmembers Cheryl Davila and Kate Harrison

Subject: Short-Term Referral to the Planning Commission and Design Review Committee to Research and Draft an Urban Forestry Ordinance Requiring Tree Planting Upon Completion of New Residential Construction and Certain Alterations

RECOMMENDATION
Short-term Referral to the Planning Commission and Design Review Committee (DRC) to research and draft an Urban Forestry Ordinance requiring tree planting upon completion of new residential construction and certain alterations. The Planning Commission and DRC should consider the following:

- Establishing appropriate tree planting requirements, e.g. a ratio of trees required per square foot, for new single-family and multi-family construction, as well as qualifying alterations to existing residential buildings.
- Establishing appropriate tree planting requirements for larger projects, including options to plant trees at alternative locations identified by the City and within the City limits. The developer should incur the cost of maintenance of the trees for a defined period of years after planting.
- Establishing appropriate California Natives species requirements. Refer to the California Native Plant Society for a list of eligible trees. [https://www.cnps.org/](https://www.cnps.org/)

BACKGROUND
Across the country, cities are implementing programs to increase urban forestry as a measure that improves air and water quality, absorbs greenhouse gases, improves public health, provides habitat for wildlife and beautifies cities. According to the Guardian, “Trees can cool cities by between 2C and 8C. When planted near buildings, trees can cut air conditioning use by 30%, and, according to the UN Urban Forestry office, reduce heating...
energy use by a further 20-50%. One large tree can absorb 150kg of carbon dioxide a year, as well as filter some of the airborne pollutants, including fine particulates."\(^1\)

New York City has an understanding of the importance of increasing trees in urban environments. NYC has a policy to ensure that, "All new buildings and all enlargements exceeding 20 percent of the floor area must provide one new street tree for every 25 feet of building road frontage. These requirements must be satisfied for the builder to obtain a Certificate of Occupancy from the Department of Buildings (DOB)".\(^2\)

This policy has paid off in environmental and economic gains for New York City: "When the New York City park department measured the economic impact of its trees, the benefits added up to $120m a year. (Compare that to the $22m annual parks department expenditure.) There were $28m worth of energy savings, $5m worth of air quality improvements and $36m of costs avoided in mitigating storm water flooding."\(^3\)

Berkeley must take similar actions to mitigate habitat loss of wildlife and the loss of oxygen production and carbon sequestration when trees in our urban forest are lost. The goal of this ordinance is to plant more trees than currently exist in our urban forest. Current building and zoning codes in our City require parking spaces in certain circumstances, yet no trees are required.

The City of Berkeley incorporated the 2016 California Green Building Standards Code (CALGreen) into local Building Codes. Those standards are reserved only for residential projects which increase “the building’s conditioned area or volume”. CAL Green applies to non-residential projects with either a $200,000 or higher valuation or 1,000 square feet of area or more. CALGreen requires that: Trees excavated must be “reused” or “recycled”.

Trees are also an option to address the “cutoff luminaries per Section 132 (b) of the California Energy Code”; a builder can either “Provide trees or man-made screens around perimeter of site.” Even with CALGreen, trees are only an option for builders. Parcels that have trees before a building permit are not being required to have trees upon the completion of a building project. In essence, existing trees on a parcel not under a protected status that are cut down during a build become woodchips and compost. As the tree decomposes, the greenhouse gases stored in the tree are released back into the atmosphere.

CALGreen states that local jurisdictions reserve the right to go above and beyond the requirements of CALGreen. The first “Compliance Method” states: “Determine if a local construction ordinance is in place in your jurisdiction and comply with the more stringent requirement or as accepted by the local enforcing agency.” As signers of the Paris Agreement, we urge Berkeley to take stronger action to promote and grow our urban forest.

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\(^1\) The Guardian; [https://www.theguardian.com/cities/2016/oct/12/importance-urban-forests-money-grow-trees](https://www.theguardian.com/cities/2016/oct/12/importance-urban-forests-money-grow-trees)


\(^3\) The Guardian; [https://www.theguardian.com/cities/2016/oct/12/importance-urban-forests-money-grow-trees](https://www.theguardian.com/cities/2016/oct/12/importance-urban-forests-money-grow-trees)
FISCAL IMPACTS OF RECOMMENDATION
Unknown.

ENVIRONMENTAL SUSTAINABILITY
Trees potentially can absorb almost fifty pounds of carbon dioxide per year and can sequester close to a ton of carbon dioxide (CO2) by the time it reaches 40 years maturity. Trees absorb CO2 into itself, while releasing oxygen. Trees are natural carbon eaters. Our air will be cleaner as the trees grow and mature.

Planting trees reduces our carbon footprint while beautifying our community. Mature trees help reduce runoff, absorb ozone and provide windbreaks which potentially could lower utility bills. Tree planting will assist in achieving our goals for the Climate Emergency Declaration and the Climate Action Plan.

CONTACT PERSON
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ATTACHMENTS & LINKS:
- California Urban Forests Council: https://caufc.org/why-urban-forests/
- San Francisco Urban Forest Plan
- Street Tree Planting Standards for New York City 2016
Street Tree Planting Standards for New York City 2016
Table of Contents

Overview..................................................................................................................................................................................... 4
Street Tree Planting Requirements for New Buildings .............................................................................................................. 4
Design Requirements ........................................................................................................................................................................... 5
Spacing Requirements ........................................................................................................................................................................... 5
Tree Pit Dimensions ........................................................................................................................................................................... 5
Grouped Plantings ............................................................................................................................................................................... 6
Species Selection ................................................................................................................................................................................ 6
Structural Soils .................................................................................................................................................................................. 6
Soil Cells (Silva Cells) ....................................................................................................................................................................... 6
Permeable Pavement or Pavers ......................................................................................................................................................... 6
Bioswales / Green Infrastructure .................................................................................................................................................... 7
Plant Pest Control Requirements .................................................................................................................................................. 7
Asian Longhorned Beetle ................................................................................................................................................................. 7
Materials.......................................................................................................................................................................................... 7
Plants ............................................................................................................................................................................................... 7
Backfill .......................................................................................................................................................................................... 8
Mulch .......................................................................................................................................................................................... 9
Water .......................................................................................................................................................................................... 9
Planting Specifications ....................................................................................................................................................................... 9
Planting Seasons ............................................................................................................................................................................... 10
Installation ....................................................................................................................................................................................... 10
Tree Wrap ........................................................................................................................................................................................ 11
Staking ........................................................................................................................................................................................ 11
Pruning ........................................................................................................................................................................................ 11
Watering ......................................................................................................................................................................................... 12
Mulching ...................................................................................................................................................................................... 12
Seasonal Maintenance ..................................................................................................................................................................... 12
Watering ......................................................................................................................................................................................... 12
Other Maintenance Activities .......................................................................................................................................................... 12
Important Note: All permit holders are expected to be familiar with and to plant in accordance with NYC Parks Standards. Detailed Parks approved specifications may be available. Ask your NYC Parks Forester for further details when applying for or requesting a permit. All permit request must be made using the new Tree Work Permit and Plan Review Application found at the following link: https://www.nycgovparks.org/services/forestry/forestry-application
Introduction

The mission of Forestry, Horticulture, and Natural Resources is to protect, restore, expand and manage New York City’s green spaces and natural areas to maximize the benefits for environmental and community health and resilience.

Overview

Street trees are important to our quality of life in the city. They are living elements of our street infrastructure. Located on the public right-of-way, they provide cooling shade, cleaner air, and more beautiful urban streetscapes. Trees confer important aesthetic and ecological benefits to city residents as well. Plants in the urban landscape, however, face a variety of environmental and physical stresses including pedestrian and vehicular traffic, soil compaction, air pollution, and drought. Some of the key factors to maximize long-term plant survival are proper handling, careful planting, and immediate and continued aftercare.

All trees planted on the public right-of-way are under the jurisdiction of the Department of Parks & Recreation as property of the City of New York. A valid tree planting permit must be obtained in order to plant on the public right-of-way, and plantings must be done in accordance with the agency’s current street tree planting standards. Any tree work improperly performed or otherwise not in accordance with these specifications may be subject to remedial work at the tree work entity’s expense, and/or additional penalties.

Street Tree Planting Requirements for New Buildings

All new buildings and all enlargements exceeding 20 percent of the floor area must provide one new street tree for every 25 feet of building road frontage. These requirements must be satisfied for the builder to obtain a Certificate of Occupancy from the Department of Buildings (DOB). All jobs pre-filed with DOB after May 3, 2010 are required to undergo a Parks Plan Review before any permits or tree fund invoice can be issued.
Design Requirements

Spacing Requirements

The following requirements shall be followed when siting tree pits along sidewalks. These guidelines generally follow regulations of other agencies with jurisdiction or infrastructure on the right-of-way. These requirements are design and tree species dependent. The American with Disabilities Act (ADA) guidelines must also be followed.

a. Do not plant in front of building entrances in order to permit easy access by the Fire Department.
b. Do not plant within bus stops.
c. Do not plant within no standing zones
d. Do not plant directly over DEP water mains less than 20 inches in diameter.
e. Minimum horizontal distance from DEP water main to tree trunk is 6 feet.
f. Minimum distance between trees (trunk to trunk) shall be 20 feet to 30 feet, depending upon the tree species and other local conditions.
g. Minimum distance from a streetlight or utility pole to the tree trunk is 25 feet (this may vary with tree species).
h. Minimum distance from a stop sign to the tree trunk is 30 feet.
i. Minimum distance from other traffic signs to the tree trunk is 6 feet.
j. Suggested distance from a parking meter back to tree trunk shall be no more than 5 feet, to allow for the swing of car doors.
k. Minimum distance from a gas or water valve to the edge of the pit is 2 feet.
l. Minimum distance from an oil fill pipe to the edge of the pit is 4 feet.
m. Minimum distance from the edge of a coal chute to the edge of the pit is 2 feet.
n. Minimum distance from a fire hydrant to the edge of the pit is 3 feet.
o. Minimum distance from a curb cut or driveway to the edge of the pit is 2 feet and to the tree trunk is 7 feet.
p. Minimum distance from the corner of a street intersection to the tree trunk is 40 feet.
q. Minimum distance from the edge of the pit to any opposite obstruction (building wall, stoop, railing, property line etc.) is from 4 to 6 feet, depending upon local conditions and the amount of sidewalk traffic.
r. All tree pits must be contiguous to the street curb (except as noted below, or with the permission of the Forester).
s. Trees may be planted on either side of sidewalks (if any exist) in lawn areas where there is sufficient room between the property line and the street curb.

Additional design or spacing requirements may be imposed at the discretion of the Parks Forester reviewing your application depending on the location and site conditions.

Tree Pit Dimensions

Tree pits should be as large as possible to allow for ample growing space for the tree’s roots and to reduce the likelihood of future sidewalk lifting. The standard street tree pit size is 5 feet by 10 feet. The overall width of a sidewalk can limit the size of a tree pit. Where a 5 feet by 10 feet tree pit is not possible, alternate dimensions must be approved by the Forester.

The installation of continuous tree pits is encouraged whenever possible, and design proposals that call for continuous tree pits may be given more flexible spacing requirements by the Forester.
Grouped Plantings

Grouped plantings are sites where trees are planted closer than 20 feet from each other (trunk to trunk). Grouped plantings provide a number of environmental benefits which include: increased shading, reduced evapotranspiration, reduced soil compaction, greater available soil volume, and reduced exposure to reflective heat for an individual tree. A grouped planting can be achieved in several types of sites: (1) a GreenStreet, such as a median or traffic triangle, with opportunity for a large planting bed; (2) a continuous tree pit, where two or more trees are planted in a single trench in the sidewalk (at least 30 feet long); or (3) a raised planting bed within a plaza or alongside a pedestrian passageway. Grouped plantings are not often the preferred method of planting and are subject to approval at the discretion of the Forester reviewing your proposal.

Species Selection

Growing conditions and microclimates can vary from location to location within a borough and across the City. Species selection should take into account site conditions, design goals, and diversity goals. In choosing a species, the mature height and spread shall be considered to ensure that it will not interfere with existing or proposed structures and overhead utilities. The final selection of the species is made by the Forester. Parks will not allow large trees to be planted under primary wires and discourages small trees in large open spaces. NYC Parks publishes a list of approved species for planting on the right-of-way. (Appendix A). Alternate species not found on the approved list may be considered on a case by case basis, however, NYC Parks retains the right to determine what species is planted on the right-of-way.

Structural Soils

NYC Parks encourages the use of structural soils where appropriate, and may require its use where it is deemed necessary. Trees are not to be planted directly in structural soil, and structural soil is only to be used as a base material under hard surfaces such as concrete, permeable pavement, or permeable pavers. Exposed soil or grass covered surfaces should be excavated and replaced with fresh topsoil meeting DPR street tree planting specifications. NYC Parks has approved the use of CU and Swedish Structural Soils, and they must be installed in accordance with Parks’ specifications (Appendix B). Structural soils can only be installed with the prior consent of the Parks Forester reviewing your application and the use of a licensed structural soil manufacturer is required.

Soil Cells (Silva Cells)

Soil cells such as Silva Cells, may be used where appropriate. They can only be installed with the prior consent of the Parks Forester reviewing your application, and must be installed in accordance with Parks’ specification (Appendix C).

Permeable Pavement or Pavers

NYC Parks encourages the use of permeable pavement or pavers where appropriate to increase the amount of water available to trees and to assist in storm water capture and management. All pavement or pavers must conform to Department of Transportation (DOT) standards (Refer to DOT for materials and specifications). Parks may approve or require the placement and use of
permeable pavers or pavement around new and existing trees. The proposed use of permeable pavers or pavement should be noted in the permit application.

**Bioswales / Green Infrastructure**

Bioswales installed on the right-of-way help collect and manage storm water runoff from streets and sidewalks by directing storm water to engineered systems that typically feature soils, stones, and vegetation. At this time, Parks does not issue permits for private installations of bioswales on the right-of-way without the consent of appropriate city agencies, and provisions for maintenance in place.

**Plant Pest Control Requirements**

Any planting on the public right-of-way is required to comply with all state and federal regulations for plant pest control. More information can be obtained from the appropriate state and federal pest control agencies.

**Asian Longhorned Beetle**

Quarantine zones for the Asian Longhorned Beetle currently cover areas of Brooklyn and Queens. Applicants must read and understand the nature and area of the quarantine as presented in *Rule Making Activities, New York State, Department of Agriculture & Markets, Emergency Rule Making* (Asian Longhorned Beetle; I.D. No. AAM - 53 96 00016 - E). The applicant shall become familiar with restrictions and regulations established by all authorities having jurisdiction.

Anyone working within the Quarantine Zone must have certification from the New York State Department of Agriculture and Markets to do so. State Department of Agriculture regulations requires that applicants operating in infested areas to thoroughly clean all equipment units before relocation to non-infested areas.

Parks imposes restrictions on the planting of tree species listed as hosts for the Asian Longhorned Beetle in parts of Brooklyn and Queens. Exceptions may be considered on a case-by-case basis.

**Materials**

**Plants**

*Digging.* All trees shall be dug immediately before moving unless otherwise specified. All trees shall be dug to retain as many fibrous roots as possible. Balled and burlapped trees shall have a solid ball of earth of the minimum specified size (32 inches), securely held in place by untreated burlap and stout rope (nylon rope is NOT acceptable). Oversize or exceptionally heavy trees are acceptable if the size of the ball or spread of roots is proportionally increased. Loose, broken, or manufactured balls are unacceptable. Size and grading standards shall conform to those of the *American Association of Nurserymen American Standards for Nursery Stock, 1996 Edition*, unless otherwise specified.

*Form and structure.* All trees shall be typical of their species or cultivar. They shall have
normal, well developed branches and a fibrous root system. They shall be sound, healthy, vigorous trees, free from defects, disfiguring knots, sunscald, injuries, abrasions of the bark, plant diseases, insect eggs, borers and all forms of infestations. All trees shall have a single, straight trunk, with leader intact (not all species have a leader but one must be present in those that do) and be branched at least five feet from the ground unless otherwise specified or approved by the Forester.

Provenance and tree size. All trees shall be nursery grown in a USDA hardiness zone of 7B or lower (material collected from the wild is unacceptable), except with permission from Parks. Tree size shall be at least 2.5 inch caliper measured at 6 inches from the ground and no larger than 3.5 inches in caliper unless otherwise authorized by NYC Parks.

Plant names. Plant names shall agree with the nomenclature of “Standardized Plant Names” as adopted by the American Joint Committee on Horticultural Nomenclature 1942 edition. All tree cultivars, patented or otherwise, must be certified by the supplying nursery. All nurseries shall be required to have a registration certificate from the Division of Plant Industry of the New York State Department of Agriculture & Markets certifying that plant material is apparently free from injurious insect and plant diseases. A similar certificate shall be required from other states where plant material is obtained.

Species selection. Species shall be selected by Parks from the list of approved street trees for New York City (Appendix A). You may only plant the species indicated on the permit and must follow any terms and conditions described on the permit. Season, site conditions, and location will affect what species may be planted.

Backfill

Material shall consist of natural loam topsoil with the addition of humus only, and no other soil type, such as a sand or clay soil type, shall be accepted. Topsoil must be free from subsoil, obtained from an area which has never been stripped. It shall be removed to a depth of one foot or less if subsoil is encountered. Topsoil shall be of uniform quality, free from hard clods, stiff clay, hardpan, sods, particularly disintegrated stone, lime, cement, ashes, slag, concrete, tar residues, tarred paper, boards, chips, sticks or any other undesirable material. Topsoil shall meet the following requirements:


b. The pH shall be in the range of 6.0 to 7.5 inclusive, unless otherwise approved or specified by the Forester.

c. Soil Textural Analysis. Topsoil shall consist of the following percentages of sand, silt and clay. Any soil that does not meet the requirements below will be rejected and removed from the site.

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<tbody>
<tr>
<td>Rocks, Stone and Gravel (&gt;2.0 mm)</td>
<td>&lt;25%</td>
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<tr>
<td>Sand (0.05-2 mm)</td>
<td>40%-70%</td>
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<tr>
<td>Silt (0.002-0.05 mm)</td>
<td>10%-50%</td>
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<tr>
<td>Clay (&lt;0.002 mm)</td>
<td>20% maximum</td>
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d. When the topsoil complies with the requirements of the specification but show a deficiency of not more than one percent in organic matter, it may be incorporated when and as permitted by the Forester.

e. Electrical conductivity shall be a maximum of 1.0. mmhos/cm. A higher level would indicate that the salt content is too high to be acceptable, and the soil must be removed from the site by the permit holder.
NYC Parks may require that soil be changed at the expense of the applicant and/or the tree work entity if the soil does not appear to meet Parks specifications. It is the applicant’s responsibility to prove that the soil used meets Parks specifications. The applicant may provide a report from an approved lab showing a passing soil sample if they wish to show that their soil meets Parks specifications. The soil should be tested for the following: nutrients, pH, soluble salt level, organic matter content, percentages of sand/silt/clay, soil textural class, gravel content, + Extra Sieve ¼. The choice of lab must be approved in advance by the appropriate Parks Forester, and soil samples must be taken by a Parks Forester or their designate, and delivered to the lab by the Forester or their designate. Only a passing sample acceptable to the Parks Forester will exempt the applicant from having to replace the soil.

**Mulch**

The applicant shall furnish and place Shredded Bark Mulch in accordance with the plans, specifications and directions of the Forester. All mulching shall be done during planting operation.

Shredded Bark Mulch shall be a natural forest product composed of shredded bark or wood not exceeding 3 inches in length and 1 inch width. Mulch shall be derived from tree material, not from wood waste or by-products like sawdust, shredded palettes, or other debris. Mulch shall be natural in color and not dyed. It shall be of a uniform grade with no additives or any other treatment. Mulch with leaves, twigs, and/or debris shall not be acceptable.

Shredded Bark Mulch shall be applied as a ground cover to the surface of all planting beds at the time of planting, one year after planting when the tree stakes are removed, at the start of each watering season during the 2 year guarantee period and when the tree is watered when directed by the Forester. Shredded Bark Mulch shall be applied to a uniform depth of 3 inches and shall be so distributed as to create a smooth, level cover over the exposed soil. A gap of approximately 2 inches should be left between the Shredded Bark Mulch and the trunk of the tree to avoid mounding above the trunk flare.

**Water**

If conditions do not allow the use of New York City water sources, the applicant must obtain their own source of water.

**Planting Specifications**

Planting shall consist of excavating all tree pits, planting, and maintaining new trees of the type and size designated on the approved list. All work shall be in accordance with these specifications (Appendix E) and to the satisfaction of the Parks Forester.

If any new tree pits have to be cut, a permit must first be obtained from DOT. A permit shall be required for each block where the pavement is broken for a new pit. It is the responsibility of the applicant to notify all owners/operators of underground facilities (code 753). Owners/operators of underground facilities include but are not limited to Keyspan, Con Edison and telephone authorities. Code 753 notifications are to be made to the NYC/LI One Call Center, Briarwood Plaza, Suite 202, 36-35 Bell Boulevard, Bayside, NY 11361. Telephone No. 1-800-272-4480. A code 753 number must be obtained before any work can begin.
No pits shall be dug until proposed locations have been marked on the ground with a white ‘P’ by a Parks Forester. Once work begins, the applicant takes full responsibility for the tree pit locations. All excavated materials shall be removed from the site and disposed of properly. The area is to be made safe and secure at the end of the workday.

Site characteristics, such as overhead power lines, existing vegetation, and infrastructure items, such as curbs and sidewalks, shall be considered. Trees that grow taller than 25 feet should not be planted directly under power lines. When possible the tree leader shall be offset from power lines.

Where subsurface obstructions (vaults, utilities, sprinklers) are encountered during excavation and restrict the planting of a tree, the applicant shall restore the disturbed area to its original condition. If damage is done to an underground obstruction, it is the responsibility of the applicant to restore the site to its original condition. A new planting location will be designated if conditions permit.

Trees shall be transported and handled with utmost care to ensure adequate protection against injury and desiccation. When transported in closed vehicles, plants shall receive adequate ventilation to prevent sweating. When transported in open vehicles, plants shall be protected by tarpaulins or other suitable cover material. Balled and burlapped trees shall be set on the ground and balls covered with soil. Until planted, all materials shall be properly maintained and kept adequately watered. Applicants are liable for any damage to property caused by planting operations and related work. All disturbed areas shall be restored to their original condition.

Applicants are only permitted to occupy an 8 foot lane adjacent to the curb. Traffic shall not be blocked off at any time during planting operations. Work shall not be performed on opposite sides of the street at the same time. Existing parking regulations shall be complied within so far as "No Standing" rules apply for the time limits specified.

**Planting Seasons**

Trees may be planted in the fall from October 1 through December 15, and in the spring from March 1 through May 15. No planting is permitted in the summer. Please be aware of the DOT Construction Embargo from November 21 through January 2 and any other restrictions (streets may vary from year to year, please check DOT’s website).

**Installation**

Remove all materials from the tree pit for the full length and width of the tree pit to the depth of the tree’s root ball (Appendix E). For excavation of a lawn strip, excavate an area at least three times the diameter of the root ball in length by the width of the lawn strip (up to 3 times the diameter of the root ball), to the dimensions listed on the permit. Extreme care shall be taken to avoid excavation to a depth greater than required. The subgrade below the root ball shall be tamped slightly to prevent settlement. All ropes, stones, etc. shall be removed from the planting site before backfilling. All excavated materials shall be removed from the site and disposed of in an acceptable manner.

Place balled and burlapped material in the prepared planting pit by lifting and carrying it by the root ball so that the ball will not be loosened. Set the tree straight and in the center of the pit. All trees shall sit, after settlement, with the base of the trunk and the beginning of the roots, known
as the “trunk flare”, level with the sidewalk grade. If the top of the root ball is not consistent with this area, the depth of the planting site should be adjusted by adding or removing soil below the root ball to make the trunk flare level with the sidewalk grade.

Cut and remove rope and wire from the top 2/3 of the root ball. At least 2/3 of the burlap shall be removed from the tree pit. The remaining wires should be pulled back and the burlap adjusted to prevent the formation of air pockets. Backfilling mixture shall be loose and friable and not frozen. Soil shall be firmed at 6 to 8 inch intervals. All tree pits are to be filled with topsoil and made level with existing conditions.

Cultivate and rake over finished planting areas leaving them in an orderly condition. At no time should topsoil be mounded to cover the trunk of the tree. The trunk flare shall always be visible. Final soil level shall be flush with the surrounding sidewalk grade to prevent potential tripping hazard.

**Tree Wrap**

No tree trunks shall be wrapped. Remove all nursery tags and protective wrapping.

**Staking**

All staking shall be done during the planting operation and shall be maintained throughout the first year of the 2 year guarantee period. After the first year, the stakes must be removed.

Stakes shall be of white cedar with bark attached and shall show no sign of cracking or decay. They shall have a maximum allowable deflection of ten percent (10%). Stakes shall be cut even so they are the same height. All trees shall be supported by 2 stakes, they shall be 8 feet long; the diameter at the middle shall be not less than 2 inches nor more than 2 ¾ inches and the diameter at the butt shall not exceed 3 inches. Stakes shall be placed outside of the rootball, driven 30 inches into the ground, and shall be fastened to the tree with a suitable length of ¾” wide, flat, woven polypropylene material such as Arbortie™ as manufactured by DeepRoot®, San Francisco, CA or approved equal that is knotted around the tree stakes (Appendix E).

Unless otherwise directed, trees shall be staked as shown on the plans and in accordance with these specifications. Stakes shall be set parallel to curbs. Trees shall stand plumb after staking. Stakes and Arbortie™ shall be removed at the end of the first year of the 2 year guarantee period, unless directed otherwise by the Forester. At the time the stakes are removed any holes left by the stake shall be filled with topsoil of the same quality as that specified in Section B-Backfill.

**Pruning**

Pruning shall be done in accordance with ANSI A300 Part 1 Standard Practices for structural pruning. When directed by the Forester, trees shall be pruned so the resulting crown retains the growth habit of the tree species. Any and all branches interfering with or hindering the healthy growth of the tree shall be removed. All diseased branches and all dead branches shall be removed. Any branch which may be partly dead, yet has a healthy lateral branch at least one-third the diameter of the parent branch shall be removed beyond the healthy branch. All stubs or improper cuts resulting from former pruning shall be removed. All cuts shall be cleanly made with sharp tools as close to the parent trunk or limb as possible without disturbing the branch
bark ridge or callus collar. Any existing nails, spikes, wire, plastic or other materials found driven into or fastened to the trunk or branches shall be removed or if approved they shall be cut flush in a manner to permit complete healing over.

**Watering**

At the time of planting, the soil around each tree shall be thoroughly saturated with at least 20 gallons (20 gal) of water. Soil shall be firmed at 6-8 inch intervals and thoroughly settled with water. Water shall be free from oil, have a pH not less than 6.0 nor greater than 8.0 and shall be free from impurities injurious to vegetation. Water may be drawn from mains owned by or supplying water to the City of New York. Please contact DEP for an access permit.

Water shall not be applied in a manner which damages plants, stakes, or adjacent areas. Each tree bed shall be watered evenly in a manner which does not erode the soil or mulch. Watering shall not cause uprooting or exposure of plant roots to the air.

**Mulching**

Bark Mulch shall be applied as a ground cover to the surface of all planting beds at the time of planting and again after the tree stakes have been removed, one year after planting. (See p.9 for Mulch specifications).

Mulch shall be applied to a uniform depth of 3 inches and shall be so distributed as to create a smooth, level cover over the exposed soil. A gap of approximately 2 inches should be left between the mulch and the trunk of the tree to avoid mounding above the trunk flare.

**Seasonal Maintenance**

**Watering**

Watering must take place throughout the 2 year guarantee period, at least 20 gallons at approximately two week intervals from May 15 to October 31. You may need to increase or reduce the frequency of watering based on weather conditions, resulting soil water content or other factors.

Water shall not be applied in a manner which damages plants, stakes, or adjacent areas. Each tree bed shall be watered evenly in a manner which does not erode soil or mulch. Watering shall not cause uprooting or exposure of plant’s roots to the air.

Damages resulting from these operations shall be immediately repaired at the expense of the applicant.

**Other Maintenance Activities**

All newly planted trees shall be maintained by the tree work entity and/or applicant until 2 years after the final inspection of permitted planting (sign-off date).

Maintenance shall include weeding, cultivating, edging, pruning, adjustment and timely removal of stakes, and Arbotite™ (these must be removed after one year), repair of minor washouts,
mulching, soil replacement and other horticultural operations necessary for the proper growth of all trees, and for keeping the entire area within the planting area neat in appearance.

All planting areas shall be cultivated and weeded with hoes or other approved tools within the period from May 15 to October 31, and such cultivating and weeding shall be repeated at least every 3 weeks. Under no conditions shall weeds be allowed to attain more than 6 inches of growth.

Pit pavement shall be maintained flush with adjacent pavement during the 2 year guarantee period. At the expiration of the guarantee period, the area around the tree shall be cultivated and weed free.

Guarantee Period

All trees must be guaranteed for 2 years. All applicants and tree work entities listed on a permit shall provide a guarantee for the trees planted. Applicants are advised to ensure that their tree work entity provides a guarantee otherwise they will may be held liable under the permit for replacing the tree.

Tree Replacement

Any tree planted that is dead or, in the opinion of Parks, in an unhealthy or unsightly condition, and/or has lost its natural shape due to dead branches, excessive pruning, inadequate or improper maintenance, or other causes including vandalism, prior to final acceptance, shall be replaced in the next planting season. There shall be a 2 year guarantee on trees commencing after the final inspection of the permitted planting (sign-off date). The topsoil in the tree pit shall be changed when any replacement tree is planted.

Where dead trees have been identified, whether due to natural causes or vandalism, the dead material shall be removed, including stakes, and Arbortie™ within 30 days of notification. When necessary, topsoil, grass seed or appropriate paving material shall be added to the pit to eliminate potential tripping hazards at the time of removal. Photos must be submitted to Parks showing the proper removal of trees. A renewed permit must be obtained to replant during the planting season.

Vandalism

Where vandalism or related causes are agreed as the cause for tree replacement, the applicant shall be responsible for all necessary replacements during the 2 year guarantee period as determined by the Forester.

Finishing

Tree Pit Guards

Tree pit guards may be required by Parks. A tree pit guard is usually a cast-iron fence or wrought iron wickets, installed around a tree pit for protection. Parks recommends a low cast-iron fence or wrought-iron wickets that is 18 inches high. Tree guard posts shall be solid steel or reinforced aluminum. Tree guards must be three sided leaving the street side open and should
not be embedded into concrete. This will protect the tree from dogs and pedestrians and give it enough space to grow for many years to come.

NYC Parks has standardized and approved designs which are encouraged for all tree guard installations (Appendix D). Alternative designs may be approved on a case-by-case basis and must be three-sided, approximately 18 inches tall, with no sharp points, installed on the outer perimeter of the tree bed, and positioned at least one foot short of the curb with the curbside open. Solid walls are not permissible. Water must be able to flow into the tree bed on all sides. The applicant takes full responsibility for maintaining the tree guard in a safe condition. If the condition of the tree guard is not maintained in a safe condition the tree guard will be removed by NYC Parks. Interested parties should apply for a permit to ‘Install Tree Guard’ before installing a tree guard. The permit is to ‘Install Tree Guard’.

**Tree Grates**

Sidewalk-level tree grates are not permitted.

**Pavers**

Pavers are also not to be used without express written permission from Parks.

**Other**

Never plant Ivy or woody shrubs/plants in the tree pit as they compete with the tree for vital nutrients.
# APPENDICES

## Appendix A

### LIST OF APPROVED SPECIES

<table>
<thead>
<tr>
<th></th>
<th>Specie</th>
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<th>Specie</th>
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<tbody>
<tr>
<td>1</td>
<td><em>Abies concolor</em></td>
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<td><em>Betula nigra 'Heritage'</em></td>
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<td>* Celtis laevigata*</td>
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<td><em>Acer miyabe 'State Street'</em></td>
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<td><em>Celtis occidentalis 'Praire Sentinal'</em></td>
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89 Crataegus 'Lavellus'
90 Crataegus phaenopyrum 'Washington'
91 Crataegus viridis 'Winter King'
92 Cryptomeria japonica 'Angelica'
93 Cryptomeria japonica 'Black Dragon'
94 Cryptomeria japonica 'Yoshino'
95 Eucommia ulmoides
96 Eucommia ulmoides 'Emerald Pointe'
97 Eucommia ulmoides 'Emerald Sunshine'
98 Fagus sylvatica 'Dawyckii Purple'
99 Fagus sylvatica 'Riversii'
100 Fraxinus americana
101 Fraxinus pennsylvanica 'Leprechaun'
102 Fraxinus pennsylvanica 'Patmore'
103 Gingko biloba
104 Gingko biloba 'Autumn Gold'
105 Gingko biloba 'Columnaris'
106 Gingko biloba 'Fairmont'
107 Gingko biloba 'Fastigate'
108 Gingko biloba 'Magyar'
109 Gingko biloba 'Princeton Sentry'
110 Gingko biloba 'Shangri-la'
111 Gleditsia triacanthos var. inermis 'Draves'
112 Gleditsia triacanthos var. inermis 'Halka'
113 Gleditsia triacanthos var. inermis 'Shademaster'
114 Gleditsia triacanthos var. inermis 'Imperial'
115 Gleditsia triacanthos var. inermis 'Skyline'
116 Gleditsia triacanthos var. inermis 'Streetkeeper'
117 Gymnocladus dioicus
118 Gymnocladus dioicus 'Espresso'
119 Gymnocladus dioicus 'Prairie Titan'
120 Halesia carolina
121 Halesia carolina 'Arnold Pink'
122 Halesia diptera 'Magniflora'
123 Halesia 'Jersey Belle'
124 Halesia monticola
125 Juniperus chinensis 'Hetzii'
126 Juniperus chinensis 'Ketleri'
127 Juniperus virginiana
128 Koelreuteria paniculata
129 Koelreuteria paniculata 'Fastigiata'
130 Koelreuteria paniculata 'Gold Candle'
131 Koelreuteria paniculata 'Rose Lanterns'
132 Laburnum x watereri
133 Lagerstroemia 'Muskogee'
134 Lagerstroemia 'Natchez'
135 Lagerstroemia 'Tuskegee'
136 Liquidambar formosana
137 Liquidambar styraciflua
138 Liquidambar styraciflua 'Cherokee'
139 Liquidambar styraciflua 'Happidaze'
140 Liquidambar styraciflua 'Moraine'
141 Liquidambar styraciflua 'Slender Silhouette'
142 Liquidambar styraciflua 'Worplesdon'
143 Liriodendron tulipifera 'Arnold'
144 Liriodendron tulipifera 'Emerald City'
145 Maackia amurensis
146 Maackia amurensis 'Starburst'
147 Magnolia 'Butterflies'
148 Magnolia 'Elizabeth'
149 Magnolia macrophylla
150 Magnolia soulangiana
151 Magnolia soulangiana 'Rustica Rubra'
152 Magnolia 'Wades Memory'
153 Malus 'Adams'
154 Malus 'Cardinal'
155 Malus 'Centurion'
156 Malus 'Coralburst'
157 Malus 'Dolgo'
158 Malus 'Donald Wyman'
159 Malus 'Harvest Gold'
160 Malus 'Sugartyme'
161 Malus 'Prairiefire'
162 Malus 'Pink Spire'
163 Malus 'Robinson'
164 Malus 'Spring Snow'
165 Malus 'Sugartyme'
166 Metasequoia glyptostroboides
167 Metasequoia glyptostroboides 'Gold Rush'
168 Nyssa sylvatica
169 Nyssa sylvatica 'Forum'
170 Nyssa sylvatica 'Red Rage'
171 Nyssa sylvatica 'Wildfire'
172 Ostrya virginiana
173 Parrotia persica
174 Parrotia persica 'Vanessa'
175 Parrotia persica 'Ruby Vase'
176 Pistache chinensis
177 Pistache chinensis 'Pairs Choice'
178 Platanus x acerifolia 'Bloodgood'
179 Platanus x acerifolia 'Columbia'
180 Platanus x acerifolia 'Exclamation'
181 Prunus 'Amanowagawa'
182 Prunus blireana
183 Prunus cerasifera 'Crimson Point'
184 Prunus cerasifera 'Krauter Vesuvius'
185 Prunus cerasifera 'Mt. St. Helens'
186 Prunus cerasifera 'Newport'
187 Prunus cerasifera 'Thundercloud'
188 Prunus cistena 'Schmidtcs'
189 Prunus 'Dreamcatcher'
190 Prunus 'Holly Jolivet' 
191 Prunus 'Mount St. Helens'
192 Prunus 'Mt Fuji'
193 Prunus 'Okame'
194 Prunus padus
195 Prunus padus 'Merlot'
196 Prunus padus 'Summer Glow'
197 Prunus 'Princeton Snowcloud'
198 Prunus 'Royal Burgundy'
199 Prunus sargentii
200 Prunus sargentii 'Columnaris'
201 Prunus sargentii 'Rancho'
202 Prunus serotina
203 Prunus serrulata 'Kwanzan'
204 Prunus serrulata 'Shirotae'
205 Prunus 'Snow Goose'
206 Prunus 'Snow Goose x copper graft'
207 Prunus subhirtella 'Autumnalis'
208 Prunus virginiana 'Canada Red'
209 Prunus x hillieri 'Spires'
210 Prunus x yedoensis
211 Prunus x yedoensis 'Akebono'
212 Prunus x yedoensis 'Cascade Snow'
213 Quercus acutissima
214 Quercus alba
215 Quercus bicolor
216 Quercus coccinea
217 Quercus 'Crimson Spire'
218 Quercus dentata
219 Quercus ellipsoidalis
220 Quercus frainetto
221 Quercus garrania
222 Quercus imbricaria
223 Quercus lyrata
224 Quercus macrocarpa
225 Quercus muehlenbergii
226 Quercus nuttali
227 Quercus palustris
228 Quercus palustris 'Green Pillar'
229 Quercus phellos
230 Quercus phellos 'Hightower'
231 Quercus prinus
232 Quercus 'Regal Prince'
233 Quercus robur
234 Quercus robur x bicolor 'Kindred Spirit'
235 Quercus robur 'Skyrocket'
236 Quercus robur var. Fastigiata
237 Quercus rubra
238 Quercus x comptoniae
239 Quercus sargentii
240 Quercus shumardii
241 Quercus texana
242 Quercus velutina
243 Robinia pseudoacacia 'Frisia'
244 Robinia pseudoacacia 'Purple Robe'
245 Sequoia gigantea
246 Stewartia pseudocamellia
247 Styphnolobium japonicum 'Millstone'
248 Styphnolobium japonicum 'Regent'
249 Styrax japonica
250 Styrax japonica 'Emerald Pagoda'
251 Styrax japonica 'Snowcone'
252 Styrax obbasia
253 Syringa pekinensis 'Beijing Gold'
254 Syringa pekinensis 'China Snow'
255 Syringa pekinensis 'Summer charm'
256 Syringa reticulata
257 Syringa reticulata 'Snowcap'
258 Syringa reticulata 'Ivory Silk'
259 Taxodium ascendens 'Nutans'
260 Taxodium distichum
261 Taxodium distichum 'Shawnee Brave'
262 Tilia americana 'Continental Appeal'
263 Tilia americana 'Legend'
264 Tilia americana 'McSentry'
265 Tilia americana 'Redmond'
266 Tilia cordata 'Corinthian'
267 Tilia cordata 'Corizam'
268 Tilia cordata 'Glenlevyn'
269 Tilia cordata 'Greenspire'
270 Tilia cordata 'Prestige'
271 Tilia cordata 'Shamrock'
272 Tilia cordata 'Unizam'
273 Tilia mongolica 'Harvest Gold'
274 Tilia tomentosa 'Green Mountain'
275 Tilia tomentosa 'Satin Shadow'
276 Tilia tomentosa 'Sterling'
277 Tilia tomentosa 'Szeleste'
278 Tilia x euchlora
279 Tilia x euchlora 'Laurelhurst'
280 Ulmus 'Accolade'
281 Ulmus americana 'Princeton'
282 Ulmus americana 'Valley Forge'
283 Ulmus 'Athena'
284 Ulmus 'Emerald Sunshine'
285 Ulmus 'Frontier'
286 Ulmus 'Homestead'
287 Ulmus 'Jefferson'
288 Ulmus 'Morton Glossy'
289 Ulmus 'New Harmony'
290 Ulmus 'New Horizon'
291 Ulmus parvifolia 'Everclear'
292 Ulmus parvifolia 'Allee'
293 Ulmus parvifolia 'Bosque'
294 Ulmus parvifolia 'Dynasty'
295 Ulmus 'Patriot'
296 Ulmus 'Pioneer'
297 Ulmus 'Prospector'
298 Ulmus 'Triumph'
299 Zelkova serrata 'City Sprite'
300 Zelkova serrata 'Green Vase'
301 Zelkova serrata 'Halka'
302 Zelkova serrata 'Mushashino'
303 Zelkova serrata 'Variegata'
304 Zelkova serrata 'Village Green'
305 Zelkova serrata 'Wireless'
STRUCTURAL SOIL

TREE CROWN AND TRUNK SHALL BE FREE OF DEFECTS AND TRUE TO FORM

MAINTENANCE TRACKING TAG ATTACHED TO STURDY SCAFFOLD BRANCH

TWO (2) PIECES OF "ARBOR TIES" LOOPED AROUND TREE TRUNK THROUGH ONE ANOTHER, TWISTED AND SECURED TO STAKE

TWO (2) 8' LONG, 3" DIA, STAKES SET OUTSIDE OF ROOTBALL, LEVEL AND WITH 5'-6" VISIBLE ABOVE GROUND

ROOTBALL SHALL BE EXPOSED AND FLUSH WITH FINISH GRADE

TOPSOIL SHALL BE FORMED 4" TO 6" DEEP, ROOT FLARE SHALL BE EXPOSED AND FLUSH WITH FINISH GRADE

BARK CHIP MULCH: 3" DEPTH, FINISH GRADE

TOPSOIL SHALL BE NEW SOIL MEETING DPR SPECIFICATIONS

UNDISTURBED SUBSTRATE

CONCRETE PAVING, THICKNESS VARIES

PAVING BASE COURSE

GEOTEXTILE

STRUCTURAL SOIL INSTALLED IN 6" LIFTS. EACH LIFT COMPACTED TO 95% AS PER SPECIFICATIONS

Tree Planting & Structural Soil Detail

NOT TO SCALE
CONTINUOUS STRUCTURAL SOIL

TREE CROWN AND TRUNK SHALL BE FREE OF DEFECTS AND TRUE TO FORM.

MAINTENANCE TRACKING TAG ATTACHED TO STURDY SCAFFOLD BRANCH.

TWO (2) PIECES OF "ARBOR TIES" SHALL BE LOOPED AROUND TREE TRUNK THROUGH ONE ANOTHER, TWISTED AND SECURED TO STAKE.

TWO (2) 8' LONG, 3" DIA. STAKES. SET STAKES OUTSIDE OF ROOTBALL, LEVEL AND WITH 5'-6" VISIBLE ABOVE GROUND.

ROOT FLARE SHALL BE EXPOSED AND FLUSH WITH FINISH GRADE.

TOPSOIL SHALL BE FORMED INTO 4-6" WIDE SAUCER AROUND PERIMETER OF ROOTBALL WITH 4" HIGH SOIL AND MULCH TO A 3" DEPTH.

ROOTBALL BASKET SHALL BE CUT TO REMOVE THE TOP 213 OF WIRE AND BURLAP.

CONCRETE PAVING, THICKNESS VARIES.
PAVING BASE COURSE.
STRUCTURAL SOIL INSTALLED IN 6" LIFTS, EACH LIFT COMPACTED TO 95% AS PER SPECIFICATIONS.

TOPSOIL SHALL BE NEW SOIL MEETING DPR SPECIFICATIONS.

NO TO SCALE.
SOIL CELL UNIT IN SINGLE LAYER

1. TREE CROWN AND TRUNK SHALL BE FREE OF DEFECTS AND TRUE TO FORM.
2. MAINTENANCE TRACKING TAG ATTACHED TO STURDY SCAFFOLD BRANCH.
3. TWO (2) PIECES OF "ARBOR TIES" SHALL BE LOOPED AROUND TREE TRUNK THROUGH ONE ANOTHER.
4. TWISTED AND SECURED TO STAKE SOIL CELL UNIT.
5. 1-3' GAP BETWEEN UNITS, ANCHORED TO GROUND WITH 10" SPIKE.
6. 1" AIR SPACE BETWEEN SOIL CELL UNIT DECK AND PLANTING SOIL.
7. TWO (2) 8' LONG, 3" DIA. STAKES. SET STAKES OUTSIDE OF ROOTBALL, LEVEL AND WITH 5'-6" VISIBLE ABOVE GROUND.
8. ROOT FLARE SHALL BE EXPOSED AND FLUSH WITH FINISH GRADE.
9. TOPSOIL FORMED INTO 4-Q" WIDE SAUCER AROUND PERIMETER OF THE ROOTBALL.
10. ROOTBALL BASKET SHALL BE CUT TO REMOVE TOP 2 1/2" OF WIRE AND BURLAP.
11. BARK CHIP MULCH, 3" DEPTH.
12. FINISH GRADE AT EXISTING CURB.
13. PLANTING SOIL INSTALLED IN 8" LIFTS (2 LIFTS PER SOIL CELL UNIT).
14. GEOTEXTILE 18" MIN. OVERLAP AT BASE 12" MINIMUM BELOW BASKET.
15. GEOTEXTILE COMPACTED TO 96%.
16. AGGREGATE BASE.
17. GeoGRID. 6" MINIMUM BELOW BACKFILL.
18. BACKFILL INSTALLED IN 4" LIFTS.
19. 1" AIR SPACE BETWEEN SOIL CELL UNIT DECK AND PLANTING SOIL.
20. CONCRETE PAVING. 4" AGGREGATE SUB BASE.
21. 4" AGGREGATE SUB BASE.
22. 12" MINIMUM OVERLAP AT TOP OF CELLS.
23. BACKFILL INSTALLED IN 4"-6" LIFTS, COMPACTED TO 95%.
SOIL CELL UNIT IN DOUBLE LAYER

--- PLANTING SOIL COMPACTED TO 95% BELOW ROOT BALL

TREE CROWN AND TRUNK SHALL BE FREE OF DEFECTS AND TRUE TO FORM

MAINTENANCE TRACKING TAG -------- ATTACHED TO STURDY SCAFFOLD BRANCH

TWO (2) PIECES OF NEW "ARBOR TIES" -------, SHALL BE LOOPED AROUND TREE TRUNK THROUGH ONE ANOTHER, TWISTED AND SECURED TO STAKE

TWO (2) 8' LONG, 3" DIA, STAKES, SET STAKES OUTSIDE OF ROOTBALL, LEVEL AND WITH 5'-6" VISIBLE ABOVE GROUND

ROOT FLARE SHALL BE EXPOSED AND FLUSH WITH FINISH GRADE

TOPSOIL FORMED INTO 1'-2" WIDE SAUCER AROUND PERIMETER OF THE ROOTBALL

WITH 4" HIGH SOIL WITH 3" HIGH MULCH

ROOTBALL BASKET SHALL BE CUT TO REMOVE TOP 1/3 OF WIRE AND BURLAP

CONCRETE PAVING, THICKNESS VARIES POSITION CURB OVER SOIL CELL POSTS

PAVING BASE COURSE

GEOTEXTILE, 18" MIN. OVERLAP PAST EXCAVATION SOIL CELL UNIT. 1-3" GAP BETWEEN UNITS. ANCHORED TO GROUND WITH 10" SPIKE

1" AIR SPACE BETWEEN SOIL CELL UNIT DECK AND PLANTING SOIL

PLANTING SOIL INSTALLED IN 8" LIFTS (2 LIFTS PER SOIL CELL UNIT)

GEOGRID. 6" MINIMUM BELOW BACKFILL AT BASE. 12" MINIMUM OVERLAP AT TOP OF CELLS

BACKFILL INSTALLED IN 4"-6" LIFTS COMPACTED TO 95%

4" AGGREGATE SUB BASE COMPACTED TO 95%

BARK CHIP MULCH, 3" DEPTH GEOTEXTILE

TOPSOIL SHALL BE NEW SOIL MEETING DPR SPECIFICATIONS

UNDISTURBED SUBSTRATE
Appendix F

Tree aown and trunk shall be free or defects and true to fonn.

8 Lono. 3 Dla cedar stakes set outside of rootball

Topsoil shall be ronned into 4-6. Wide saucer around the perimeter or the rootball

Arbor Tre shall be looped around tree through each other 1\Wisled and secured to the stake

Fmrshed grade

Backfill shall be newsort meetno DPR spedffcations

Depth of rootball varies

3 Bark chip mulCh lajer.

Tree Planting & Stake Detail

Not to Scale