

Town of Brighton
Arboricultural Standards and Specifications



Table of Contents

Section I: Materials	1
A. Trees	1
1. Quality Standards	
2. Town of Brighton Master Tree List	
B. Landscape Materials	1
1. Topsoil	
2. Grass Seed	
3. Mulch	
4. Staking	
5. Geotextile Fabric	
6. Fertilizer	
C. Hardscape Materials	2
1. Brick	
2. Stone	
3. Cushion Sand	
Section II: Tree Planting	3
A. Street Tree Planting Site Standards	3
B. Planting Specifications	4
1. Quality Assurance Inspection	
2. Tree lawn or lawn area	
3. Tree pit	
4. Transplanting	
5. Tree Staking	
6. Warranty	
7. Pre- and Post Planting Care	
Section III: Hardscape Restoration Specifications	7
A. Setting a Tree Grate	7
B. Brick or Stone Setting	7
C. Saw Cutting a Sidewalk Area for a Tree Pit Installation	7
Section IV: Tree Pruning	8
A. Standard	8
B. Specifications	8
1. General	
2. Safety Prune	
3. Maintenance Prune	
4. Train Prune	

Section V: Tree & Stump Removal	12
A. Standard	12
B. Specifications	12
Section VI: Tree Protection	13
A. Standard	13
B. Tree Protection Specifications	14
Section VII: Tree Fertilization	16
A. Standard	16
B. Specification	16

Section I: Materials

A. Trees

1. Quality Standards

a. General

Trees species, cultivar or variety, caliper and restrictions for use are detailed in the current Town of Brighton, NY Master Tree List (Appendix 1). No tree species substitutions shall be made without the written authorization of the Commissioner of Public Works. Trees shall be true to the botanical name. Trees shall be grown in nurseries Zone 6 or colder as described by the USDA Plant Hardiness Zones. Trees shall meet the most current edition of the "American Standard for Nursery Stock"; ANSI Standard Z60.1, American Association of Nurserymen 1250 I St. NW, Suite 500, Washington, D.C. 20005 (205)789-2900.

b. Form

All trees are to be grown for street tree use with strong center lead for a minimum of 3/4 overall tree height. Trees shall be single stemmed unless otherwise approved. Type 1 & 2 Shade Trees shall have a branching height of six (6) feet for shade trees. Type 3 & 4 Ornamental street trees 2.5" to 3" caliper shall have a branching height of four and a half (4 1/2) feet; trees 3" to 3.5" caliper shall have a branching height shall be five (5) feet.

2. Town of Brighton Master Tree List

A list of acceptable trees for planting on town of Brighton property is provided in Appendix 1. Substitutions to this list and final tree selections must be approved by the Commissioner of Public Works or designated Town representative.

B. Landscape Materials

1. Topsoil

Topsoil shall be natural, fertile agricultural soil, capable of sustaining vigorous plant growth. It shall be of uniform composition throughout and without admixtures of subsoil. The topsoil shall be screened free of stones, lumps, plants, roots, sticks or other extraneous matter. The topsoil shall have a ph of 6.5 to 7.2, it shall have an organic content of not less than 2%, nor more than 20%, and the texture shall be sand/loam composition. In most situations, native soil may be used when available.

2. Grass Seed

a. General

Seed shall be of current crop year with a germination rate of no less than 85%, must be certified, and have a purity of no less than 95%. Certified seed tags shall be available for inspection on site.

b. Composition

Seed composition and types shall be in the following mixture: 60% Fine Fescue, 20% Perennial Ryegrass, 20% Kentucky Bluegrass Blend. Acceptable varieties of Fine Fescue include: Spartan, Bilgart, Aurora, Ensylva, Reliant, Shadow, JamestownII, SR3100, and SR5000. Acceptable varieties of Perennial Ryegrass include: Palmer II, PreludeII, Repell II, Affinity, Manhattan II, and SR4200. Acceptable varieties of Kentucky Bluegrass Blend include: Midnight, Touchdown, Ram I, Adlphi, Rugby, Glade, Eclipse, Challenger, and Merit.

3. Mulch

Mulch shall be seasoned shredded hardwood or bark mulch, and it shall be free of leaves, twigs and branches.

4. Staking

Stakes – Steel T-posts shall be used for staking. Stakes shall be 7 feet long for shade trees, and 6 feet long for ornamental trees.

Tree Straps – 3/4" wide 'seatbelt' webbing, with eyelets.

Wire – 14 gauge galvanized wire.

5. Geotextile Fabric

Geotextile fabric shall be appropriate for the intended use. The fabric shall be manufactured by: Marifi Incorporated, Charlotte, NC; Geotech Services, Inc., Brookfield, CT; Amoco Fabrics Co., Atlanta, GA; or approved supplier.

6. Fertilizer

Trees - Subsurface liquid fertilizer, slow release nitrogen, 30-10-7, salt index of less than 50.

C. Hardscape Materials

1. Brick

New brick pavers shall be vitrified paving brick, hard, tough, evenly burned, thoroughly annealed, regular in size and shape. When broken they shall show uniformity of texture and structure and shall be free from open or market laminations. Bricks shall conform to the current Town of Brighton specifications.

2. Stone

Stone paving blocks shall conform to the current NYSDOT Standard Specifications for granite curbs. The stone shall be bluestone, sandstone or granite. The stone shall be sound and durable, free from seams that impair its structural integrity and of a smooth splitting and machining character. Natural color variations that are characteristic of the deposit will be permitted. The exposed face of the blocks shall have no projection greater the 1/4 inch, or depression greater the 1/2 inch beyond a horizontal face plane. Blocks shall be rectangular in cross section with substantially straight edges and square corners. Stone shall conform to the current Town of Brighton specifications.

3. Cushion Sand

Cushion sand shall conform to the current NYSDOT Standard Specifications. The sand shall be clean, hard, durable uncoated particles, free from lumps of clay and all deleterious substances.

4. Stone Dust

Stone dust shall conform to the current NYSDOT Standard Specifications, material designation, and size designation. The stone dust shall be a clean durable, sharp-angled rock fragment of uniform quality.

Section II: Tree Planting

A. Street Tree Planting Site Standards

1. Residential Tree Lawn

- A. Suitable planting site must meet the following minimum distances and requirements:
 - a. Tree lawn greater than 3'.
 - b. 30' from an intersection or stop sign
 - c. 10' from driveway or fire hydrant
 - d. 5' from underground service or utility box
 - e. 10' from drip line of private tree overhanging the tree lawn
 - f. 15' from a streetlight or utility pole
- B. Sites passing the minimum requirements are evaluated using the following standards to identify acceptable planting site and determine acceptable tree size. Distances shall be measured from the most limiting site restriction.
 - a. Large trees (greater than 50' at maturity)
 - 10' or larger tree lawn
 - No overhead primary or secondary utilities unless tree can be offset at least 8'
 - 40' spacing between trees
 - 30' building offset
 - b. Medium sized trees (30' to 50' height at maturity)
 - 5.1' to 9.9' tree lawn
 - No overhead primary or secondary utilities unless tree can be offset at least 8'
 - 30' spacing between trees
 - c. Small sized trees (less than 30' height at maturity)
 - 3' to 5' tree lawns
 - 20' spacing between trees on residential streets

2. Arterial Tree Lawn

- A. Suitable planting site must meet the following minimum distances from itemized infrastructure:
 - a. Tree lawn greater than 3'
 - b. 30' from an intersection or stop sign
 - c. 10' from driveway or fire hydrant
 - d. 5' from underground service or utility box
 - e. 10' from drip line of private tree overhanging the tree lawn
 - f. 15' from a streetlight or utility pole
- B. Sites passing the minimum requirements are examined using the following guide to determine acceptable tree size. Distances shall be measured from the most limiting site restriction.
 - a. Large trees (greater than 50' height at maturity)
 - 10' or larger tree lawn
 - No overhead primary or secondary utilities unless tree can be offset at least 8'
 - 40' spacing between trees
 - 15' building offset for suitable root space
 - b. Medium sized trees (30' to 50' height at maturity)
 - 5.1' to 9.9' tree lawn
 - No overhead primary or secondary utilities unless tree can be offset at least 8'
 - 40' spacing between trees

- c. Small sized trees (less than 30' height at maturity)
40' spacing between trees on arterial streets
- 3. Arterial Tree Pits
 - A. Tree pits must meet minimum placement requirements from infrastructure.
 - B. Minimum 40' spacing between sites.
 - C. Minimum pit dimensions
 - a. New pit location projects - 4' by 4' (length x width, parallel with street)
 - b. Existing - 4' by 3' (length x width, parallel with street)
 - c. Trees selection for planting
 - Medium planting site - one story building or 30' building offset
 - Small planting site - multi-story buildings, less than 30' building offset
 - Upright planting site - requires upright tree form due to building offset.

B. Planting Specifications

1. Quality Assurance Inspection

Trees shall be inspected by the Town prior to planting. The Town must be notified at least two (2) days prior to inspection. Documentation, stating the origin of each tree must be submitted at the time of inspection. A tag, stating the species and variety, shall be attached to each tree. Trees will be inspected for general health, strong center lead, branch height, apparent shipping damage, root ball moisture content, wind burn, caliper and root ball size. Accepted trees will be tagged at inspection with non-removable tags at the Town's expense.

2. Lawn Locations (see drawing 1)

The Town shall mark street site locations with a white line on the curb or pavement and sidewalk. The tree is to be centered in the tree lawn area on an imaginary line between the two (2) marks unless the Town authorizes a change. Non-street sites shall be marked either with stakes or marking paint to designate the center of the planting site.

All rock, soil, fill or underground obstruction, shall be removed to a depth and width, as necessary to permit planting. All debris shall be removed. The area under the root ball shall hand tamped to avoid settling.

Trees shall be set plumb and the root crown three inches above pre-existing grade. All cloth and ropes shall be removed from the tops of root balls and around the stem, but not pulled out from under the root balls. Wire baskets and containers shall be removed at the time of planting. All synthetic burlap shall be removed at the time of planting.

Native soil may be used as backfill. All large earth clumps shall be broken to a diameter no greater than one (1) inch before use as backfill. All rock greater than one (1) inch in diameter shall be removed from the native soil prior to use as backfill. All foreign material shall be removed from the native soil prior to use as backfill. Backfill material shall be thoroughly settled by watering with fresh water. The cost of the water shall be born by the contractor. Backfill shall not be placed in a frozen or muddy condition. A saucer capable of holding water shall be formed about each tree.

Mulch shall be placed to a depth of three (3) inches. Mulch shall be placed to within six (6) inches of the tree trunk. Mulch shall cover the saucer dike.

3. Pit Locations

Trees and stumps smaller than 6.00 inches may be grubbed out during planting. Stumps, where present, shall be removed. Bricks, stones or grates must be removed and may be stored for reuse. The contractor is responsible for any loss or damage caused by the removal.

All rock, soil, fill or underground obstruction, shall be removed to a depth and width, as necessary to permit planting. All debris shall be removed. The area under the root ball shall hand tamped to avoid settling.

Trees shall be set plumb and the root crown three inches above pre-existing grade. All cloth and ropes shall be removed from the tops of root balls and around the stem, but not pulled out from under the root balls. Wire baskets and containers shall be removed at the time of planting. All synthetic burlap shall be removed at the time of planting.

Native soil may be used as backfill for unimproved pit locations. All large earth clumps shall be broken to a diameter no greater than one (1) inch before use as backfill. All rock greater than one (1) inch in diameter shall be removed from the native soil prior to use as backfill. All foreign material shall be removed from the native soil prior to use as backfill. Backfill material shall be thoroughly settled by watering with fresh water. The cost of the water shall be born by the contractor. Backfill shall not be placed in a frozen or muddy condition.

Mulch shall be placed around the trunk at brick and stone sites. Mulch shall be placed to a depth of two (2) inches under the grate at grate sites.

4. Transplanting

Transplanting shall be performed using a tree spade of proper dimension. Transplanting shall comply with the current ANSI Standard Z-60.1, Section 1.3.

5. Tree Staking

Stakes are required at all locations. Stakes shall be plumb. Stakes shall be placed to a depth 1 foot greater than the depth of the plant pit. At Lawn Locations, stakes shall be placed one (1) foot from the outermost portion of the root ball. At Pit Locations, stakes shall be placed outside the root ball at the outer margin of the pit, parallel to the street, or as directed by the Commissioner of Public Works or designated representative. Webbing shall be placed below the first branching. Webbing shall be interlocked. Wire shall be placed perpendicular to the tree and stakes. Wire shall be placed as to snug the webbing allowing tree trunk sway of four (4) inches.

6. Warranty

The Contractor shall provide to the Town a Guarantee Bond in the amount of 25% of the contract price. The bond shall have a Surety thereon; such Surety Company shall be acceptable to the Town, and authorized to transact business in New York State. The length of the warranty period shall be for a period as specified in the respective contract(s). All trees in an unhealthy condition, as determined by the Commissioner of Public Works, shall be removed and replaced. The Commissioner of Public Works shall provide a list of trees to be replaced in the late summer of each year. Upon notification by the Commissioner of Public Works, the contractor shall have 30 days to inspect trees scheduled for replacement. After those 30 days, the Town reserves the right to remove the rejected tree and the contractor loses all rights to protest the replacement. The replacements shall be completed by the conclusion of the following spring planting season. Trees, as determined by the Commissioner of Public Works, which have been vandalized, or lost, shall not be covered by the warranty.

7. Pre- and Post Planting Care**a. Pre - Planting Care**

Trees shall be placed standing upright with crowns untied for storage and inspection. Adequate watering and mulching shall be provided during storage. Trees shall be covered with a horticultural transport tarp during transport.

b. Post - Planting Care

A contractor shall provide supplemental care including watering after planting until final acceptance by the Town. The contractor may provide continued care at their discretion to minimize transplant losses through the warranty period.

Section III: Hardscape Restoration Specifications

A. Setting a Tree Grate

Broken or missing grates shall be replaced. The Town shall supply grates, when available. When replacement grates are not available, the site shall be bricked. The grate shall be reinstalled per the current Town specifications.

B. Brick or Stone Setting

A three (3) inch bed of sand or stone dust shall be placed. The sand or stone dust shall be evenly graded, moistened and compacted using a hand tamper. The bricks or stones shall be set in a running bond pattern, hand tight. The exposed face of the bricks or stones shall have a projection of 1/4 to 1/2 inch above horizontal plane on line with the finished grade. Sand or stone dust shall be placed within the joint until the joints are full, and any excess material shall be removed. Additional bricks or stones shall be placed as necessary to form a complete surface. The contractor shall supply additional bricks or stones.

C. Saw Cutting

Saw cutting shall comply with the current Town of Brighton specification.

Section IV: Tree Pruning

A. Standard

All pruning work on Town trees shall be completed by qualified personnel in accordance with the most current editions of the International Society of Arboriculture's; "Tree Pruning Guidelines", the American National Standards Institute's; "Tree, Shrub and Other Woody Plant Maintenance - Standard Practices", ANSI A300 and "Pruning, Trimming, Repairing, Maintaining, and Removing Trees, and Cutting Brush - Safety Requirements", ANSI Z133.1 and the following specifications.

B. Specifications

1. General

Complete a walk around inspection of the tree prior to beginning work. If a tree is in poor or stressed condition do not complete a maintenance prune. This could cause further stress to the tree and worsen its condition. Decide which limbs will be removed to remove hazards and to meet clearance standards during your walk around inspection. Evaluate the percentage of live crown you will be removing to remove hazards and meet clearance standards. If that percentage is 25% or 1/4th or more of the live crown, do not complete additional pruning. If it is less, let your percentage estimate dictate the amount of additional pruning you will complete based on the priorities listed below.

- a. No more than 25% or one-fourth (1/4) of the live crown shall be removed unless limbs present a hazard.
- b. All cuts shall be made with sharp pruning tools as close as possible to the trunk or parent limb, without cutting into the branch collar or leaving a protruding stub.
- c. All branches too large to support by one hand shall be pre-cut to avoid splitting or ripping of the bark. When necessary, ropes or other equipment shall be used to lower large branches or stubs to the ground.
- d. The use of climbing spurs or hooks is prohibited.
- e. Drop crotch pruning should be avoided. Removing the entire limb is preferable. Where drop crotching may be considered, the whole limb or leader shall be removed to the parent leader or limb, unless the ratio of the live wood to leaf area of the limb or leader is sufficient to support that limb or leader. If more than 1/4 leaf surface area of the limb or leader needs to be removed, remove the whole limb.
- f. When removing a parent leader or limb to a lateral (drop crotching), the lateral shall be one-third (1/3) to one-half (1/2) the diameter of the parent leader or limb.
- g. Priorities for pruning. The following priorities shall be followed to assist in the decision process for limb removal relative to adhering to item #1:

Crown Cleaning

Crown Raising

Crown Restoration

Structural

Crown Thinning

h. **Crown Raising.** Crown raising is specified in two diameter ranges. These are guidelines. Crown raising shall be completed to provide adequate clearance based on the site conditions and location of the tree. Limb removal decisions should be based on the goal of reaching clearance standards through whole limb removal and the health of the tree. Generally, lateral branches should not be removed below one-third the total height of the tree.

i. **Private Trees**

Trees located on private property that have hazardous limbs that may fail into the right-of-way, are blocking traffic control devices or do not meet the clearance standards as detailed below shall be pruned to correct these problems. The safety prune specification shall be used in these cases and work completed shall be restricted to pruning the portions of the tree that present a risk to the Village right-of-way.

2. Safety Prune

Policy It is Town of Brighton policy to complete a safety prune at each visit to a tree unless directed by the Commissioner of Public Works or designated representative.

Objective The purpose of this pruning is to remove hazards, prune storm damage, provide adequate clearance for permanent structures and elevate for under canopy clearance.

a. **Crown Cleaning – Hazardous limbs to be removed.**

Broken limbs lodged in the tree.

Broken hanging limbs in the tree

Dead branches one (1) inch in diameter or greater.

Split branches one (1) inch in diameter or greater.

Decaying branches with less than 65% sound wood one (1) inch in diameter or greater.

b. **Crown Restoration - Storm Damaged Branches to be removed.**

Broken lateral branches living or dead one (1) inch or greater in diameter.

Broken leaders living or dead.

c. **Crown Raising - Clearance over right-of-way, buildings, traffic control devices, signs and streetlights.**
Trees 6.01 to 12.00 in diameter breast height.

Limbs shall be removed to provide five (5) feet of clearance over permanent structures.

Limbs shall be removed to provide five (5) feet of clearance from the side of permanent structures.

Limbs shall be removed from the lower one third of the total height of the tree to provide an overhead clearance under the canopy of the tree.

Trees greater than 12.01 in diameter breast height.

Limbs shall be removed to provide ten (10) feet of clearance over permanent structures.

Limbs shall be removed to provide ten (10) feet of clearance from the side of permanent structures.

Limbs shall be removed to provide ten (10) feet of overhead clearance under the tree canopy

Limbs shall be removed to provide 10 feet of clearance from less dominant ornamental trees under the tree canopy

Limbs shall be removed to provide an overhead clearance of fifteen (15) feet over the street.

Limbs shall be removed to provide an overhead clearance of twelve (12) feet over the sidewalk.

3. Maintenance Prune

Objective The purpose of this pruning is to remove hazards, improve structural integrity, thin to improve light distribution and decrease wind resistance, and improve tree health.

a. **Crown Cleaning - Hazardous limbs to be removed.**

Broken limbs lodged in the tree.

Broken hanging limbs in the tree.

Dead branches one (1) inch in diameter or greater.

Split branches one (1) inch in diameter or greater.

Decaying branches with less than 65% sound wood one (1) inch in diameter or greater.

b. Crown Restoration - Storm Damaged Branches to be removed.

Broken lateral branches living or dead one (1) inch or greater in diameter.

Broken leaders living or dead.

c. Crown Raising - Clearance over right-of-way, buildings, traffic control devices and streetlights

Trees 6.01 to 12.00 in diameter breast height.

Limbs shall be removed to provide five (5) feet of clearance over permanent structures.

Limbs shall be removed to provide five (5) feet of clearance from the side of permanent structures.

Limbs shall be removed from the lower one third of the total height of the tree to provide an overhead clearance under the canopy of the tree.

Trees greater than 12.01 in diameter breast height.

Limbs shall be removed to provide ten (10) feet of clearance over permanent structures.

Limbs shall be removed to provide ten (10) feet of clearance from the side of permanent structures.

Limbs shall be removed to provide ten (10) feet of overhead clearance under the tree canopy.

Limbs shall be removed to provide 10 feet of clearance from less dominant ornamental trees under the tree canopy.

Limbs shall be removed to provide an overhead clearance of fifteen (15) feet over the street.

Limbs shall be removed to provide an overhead clearance of twelve (12) feet over the sidewalk.

d. Structural

Branches that rub, abase or cross a more important limb shall be removed.

Branches forming multiple leaders in a single leader type tree shall be removed.

Branches with included bark shall be removed.

e. Crown Thinning

Selective branches two (2) inches or greater in diameter shall be removed throughout the crown creating a scaffold effect moving up or out the main stem(s), leaders, and limbs.

4. Train Prune

Objective To promote a single central leader, strong scaffold branch structure and suitable permanent branch selection for clearance requirements at maturity.

a. Trunk Development – One Central Leader

Branches forming multiple leaders in a single leader type tree shall be removed. Leave the most dominant lead.

If you cannot remove a leader make a proper thinning cut to reduce the height of the less dominant lead.

b. Crown Raising

At least 1/2 the foliage should be on branches (temporary or permanent) arising from the lower 2/3's of the tree.

Branches should have similar distribution along their lengths.

c. Permanent Branch Selection - a branch that will be allowed to grow throughout the life span of the tree.

The lowest permanent branches should be selected to provide specified clearances at maturity.

Permanent branches should be spaced 6-12 inches apart by thinning for the first 5 years after

planting. After 5 years, 18 inches apart if the tree will grow larger than 12 inches at maturity.

Permanent branches directly above each other should be selected to maintain 15-36 inch spacing for small to medium sized trees and 60 inches for large trees.

A permanent branch should be less than 1/2 the diameter of the parent branch or trunk.

d. Temporary Branches - a branch that will be left at this pruning, however, will be pruned at a later pruning.

Temporary branches should be left at a spacing of 4-6 inches between permanent branches however none within 6 inches of a permanent branch.

Select the least vigorous branches as temporary branches.

If larger than desired branches need to be kept as temporaries, head them 2 or 3 buds back.

Leave several trunk sprouts if present evenly spaced and the least vigorous heading 2 to 3 buds back.

e. Structural

Branches that rub, abase or cross a more important limb shall be removed.

Branches with included bark shall be removed.

Section V: Tree & Stump Removal

A. Standard

A Town tree may only be removed provided the removal has been authorized in accordance with the Town Code Chapter 175, Trees. A tree and stump removal work shall be completed with qualified personnel and in accordance with the most current edition of the American National Standards Institute's; "Pruning, Trimming, Repairing, Maintaining, and Removing Trees, and Cutting Brush - Safety Requirements", ANSI Z133.1 and the following specifications.

B. Specifications

1. Tree Removal

a. General

Contact the Town of Brighton prior to proceeding with the removal.

b. Removal

Trees or limbs being removed that are large enough to cause hardscape or infrastructure damage on impact with the ground or infrastructure are to be lowered with roping and rigging techniques. If the tree stump is in the three-inch diameter range, chop out stump with an axe and restore the site with pitchfork, soil and seed. Otherwise, the stump shall be flush cut as close as possible to existing tree lawn grade. All wood, limbs or brush to be removed and area cleaned up daily. Brush will not be allowed to accumulate so to create a hazard.

c. Pullout

Examine the site around the pullout to ensure pulling out tree will not cause any damage to hardscape or underground utilities. Pullout tree with winch or chain and truck. Break up pullout site with pitchfork and finish grade pullout site and seed. Top soil and seed as required.

2. Stump Removal

Stumps to be ground to a minimum of 12" depth below normal ground level of tree lawn area. All adjoining roots and surface roots to be ground to 12" depth or chopped out with an axe. (See Drawing #2) Stump to be ground to a depth of 6" within 2' of an identified underground utility. All grindings must be placed back in the stump hole if site restoration is not completed at the same time as grinding. Adjacent to sidewalk, roots are to be removed to edge of sidewalk without damaging the sidewalk. No grinding when lawn area has snow cover.

3. Site Restoration

Tree Removal

All lawn damage created as a result of the tree removal operation shall be restored with specified topsoil and grass seed.

Stump Removal

Site restoration shall be completed immediately. Area to be restored shall match existing lawn area as if a tree was never in the location. Area to be restored shall be graded such that the entire area is perfectly level with adjacent ground elevation. Irregularities that form low places that will hold water or high places, such as created by root crowns, shall be eliminated and graded as above. Area requiring backfill shall be completely tamped using a mechanical or hand tamper.

Section VI: Tree Protection

General

Careless underground utility work and poor construction practices which result in root damage or cutting can lead to reduced growth rates, branch death, invasion by insects and disease, death and the possibility of tree being blown over (wind throw). It is a contractors responsibility to work responsibility in proximity to trees and a contractor will be held liable for tree damages and claims for damages against the Town which are found to be the result of a contractors malicious acts.

Tree roots provide mechanical support for the trees in addition to providing the tree with water and nutrients. Roots grow to where soil conditions provide nutrients, moisture and oxygen. About 85% of trees roots are within the top 18" of soil. Roots typically spread out 1/2 to 2 times the height of a tree. However, the tree protection zone shall be defined as the area within the tree's "dripline" (this is the area directly underneath a tree's branches).

Root cutting or damage effects tree health. The closer to the tree trunk, or the larger the root damaged or cut, the greater the damage to the tree. When roots must be cut, use a sharp implement. A clean smooth cut will produce a flush a new roots; a torn jagged cut leads to decay and little new root growth.

Prevent soil compaction whenever possible. Air and oxygen cannot reach roots when the tiny air pockets are squeezed shut by heavy equipment, construction materials or debris.

The following standards apply to work within the Town of Brighton right-of-way. Failure to abide by these standards will lead to fines and restitution fees.

Tree Protection Specifications

A. General

Exposed tree roots shall be covered with mulch and watered from a period immediately after exposure until the area is backfilled following construction.

Tree Diameter (DBH)	Distance of Tunnel from Tree Trunk (Both Sides)	Minimum Depth of Tunnel
less than 10 inches	6 feet	2 1/2 feet
10 – 14 inches	10 feet	3 feet
15 – 19 inches	12 feet	3 1/2 feet
20 inches and over	15 feet	4 feet

All cutting for the removal of sod and soil in order to establish a finished grade within 4 feet of existing trees shall be done manually.

Tree roots less than 2" are to be cut cleanly. The Town is to be notified to set up inspection and authorization to cut roots greater than 2" are in conflict with construction.

B. Tree Protection

It is the responsibility of the Permit Holder to protect all trees that are located within the work area to minimize any possible damage due to construction activities. The permit Holder shall comply with Town of Brighton Tree Protection Specification.

- a. Equipment and Material Storage - Equipment, materials or excavated spoils shall not be placed within the canopy of any tree to prevent smothering of the tree root system, or damage from construction equipment. Vehicles and construction equipment shall not be parked or left idling within the tree protection zone of a tree.
- b. Fencing - When directed in the Supplementary Conditions of the Permit Documents, the Permit Holder is to provide tree protection in the form of fencing to protect all trees within the Work Area against any cutting, breaking, skinning, or bruising of tree roots, bark and branches. Protective fencing is to be installed before any construction activities commence, and is to remain in place until the Permit Holder performs the final grading and seeding operation.

Fencing material may be either fluorescent orange construction/safety fencing, or wood rail and post. All fencing is to be at least four (4) feet high, firmly anchored and plumb. Fencing shall be installed per the Town Tree Protection fencing Specification (Drawing #3).

- c. Tree Root Cutting - Where tree root cutting is conducted, it shall be with sharp cutting tools. Exposed tree roots are to be immediately covered with wet burlap and re-buried as soon as possible.

Where extensive cutting of the tree root system has occurred, the Permit Holder is to insure the tree root system receives between one half (1/2) inch and one (1) inch of water over the tree canopy area on a weekly basis for the duration of the Permit Work.

- d. Sidewalk construction

Trees root less than 2 inches in diameter located on the walk side of a tree shall be cut no deeper than 6" below the finished grade of the new walks, and no closer than 5" from the edge of the new walk. Roots less than 2 inches in diameter in the walk area shall be removed only to a depth of 6" below finished grade of the new walk.

The contractor shall remove walks before cutting roots, and root should be cut not more than two inches beyond the edge of the proposed new sidewalk.

Occasionally, when replacing walks adjacent to trees, a thin form walk shall be poured over roots that are greater than 2 inches in diameter unless authorized by the Commissioner of Public Works or designated representative.

Sidewalks are to be removed, and roots cut, by use of hand implements only within 2 sidewalk flags of the center of street trees.

- e. Utility Installation

The least disruptive means of installing underground utilities is a combination of trenching and tunneling. Where there is insufficient space to bypass the canopy of the tree by trenching, tunneling is to be used. Tunneling requirements are as follows:

C. Tree Damage

If a tree is damaged or branches broken by construction activities, the Permit Holder shall notify the Department of Public Works. The Permit Holder may be held liable for damages for those trees that the Department of Public Works determines are damaged beyond repair.

Section VII Tree Fertilization

A. Standard

Tree fertilization shall be completed with qualified personnel and in accordance with the most current edition of the American National Standards Institute's; "Tree, Shrub and Other Woody Plant Maintenance Standard Practices (Fertilization)", ANSI A300, Federal and State requirements and the following specifications.

B. Specification

1. Timing

- Fall – post leaf drop
- Early Spring – pre leaf out

2. Fertilizer Ratio

- 3:1:1 or 3:1:2

3. Application Rate

- 2- 4 pounds actual slow release nitrogen per 1000 sq.ft. annually
- Injection pressure should not exceed 200 pounds per sq. inch

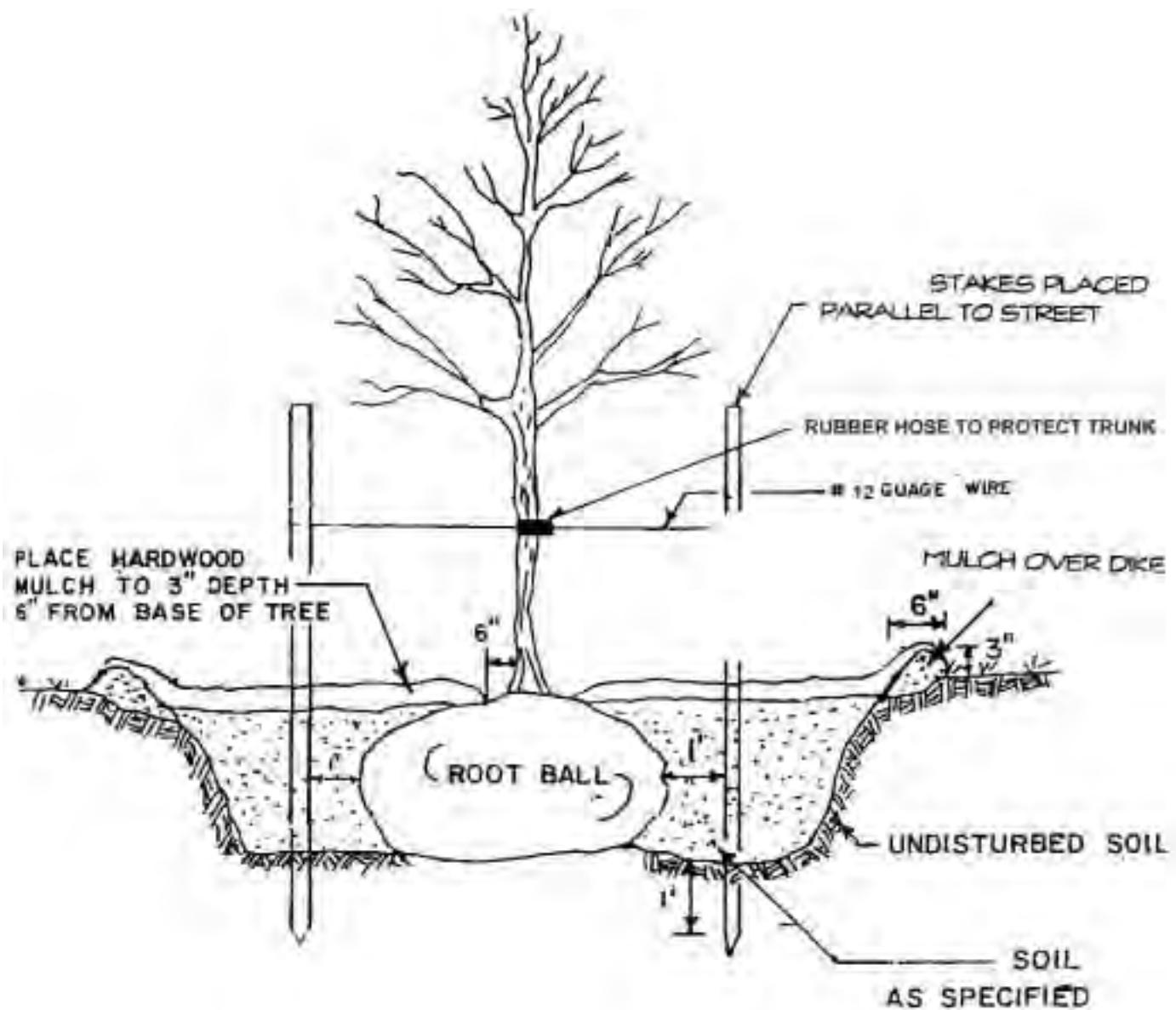
4. Application

- Sub-surface liquid injection method
- Injection sites should start near from near the trunk and radiate to near or beyond the dripline
- Damage to buttress roots should be avoided
- Injection sites should be 12 to 36 inches apart and 4 to 12 inches deep
- Fertilizer should be evenly distributed among injection sites

Appendix
Town of Brighton Master Tree List

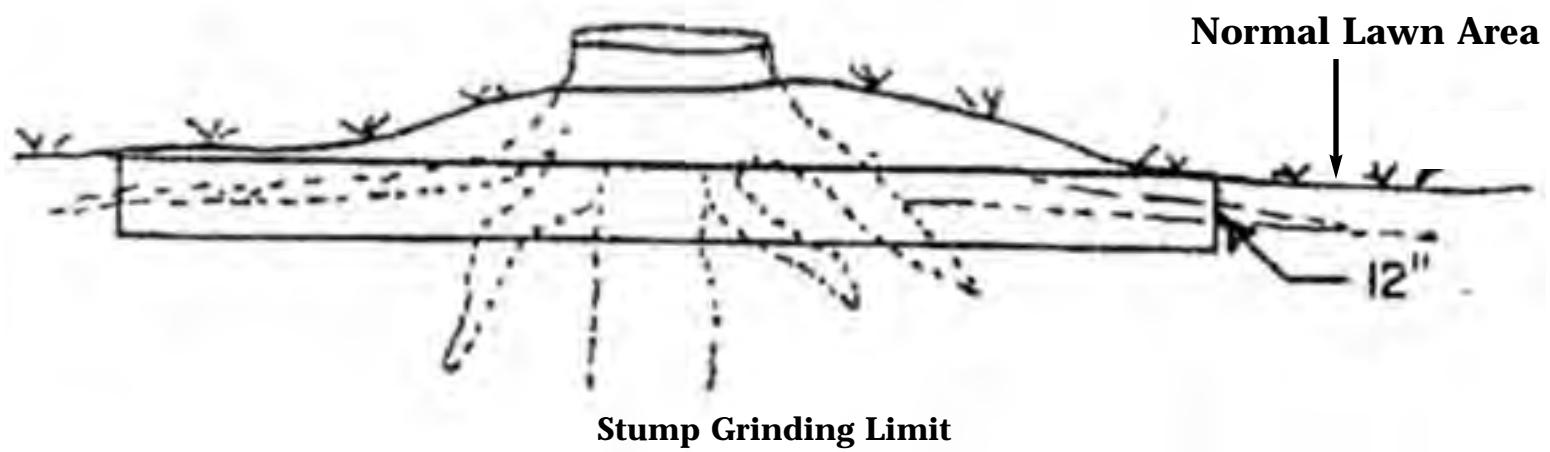
Drawings

1. Tree Planting - Tree Lawn Area

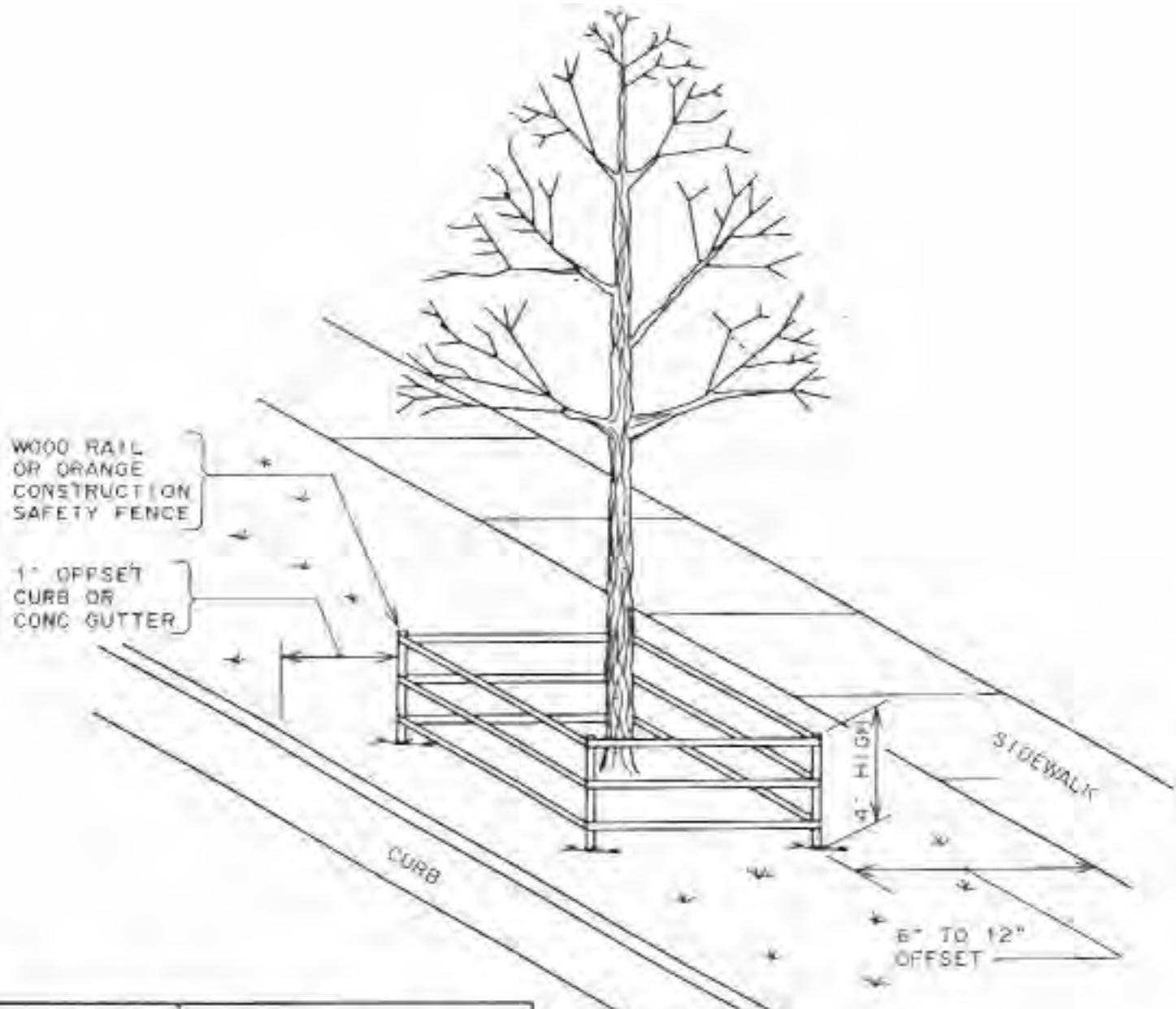


Loosen and blend the soil in the entire planting area as diagramed. The planting pit shall be 2 times the ball diameter.

2. Stump Grinding



3. Tree Protection



TREE DIAMETER (DBH)	DISTANCE OF FENCING FROM FACE OF TREE TRUNK
LESS THAN 10"	6"
10" - 14"	10"
15" - 19"	12"
20" OR MORE	15"

NOTE:

1. ALL TREES WITHIN THE PROJECT LIMITS THAT ARE TO REMAIN, ARE TO RECEIVE THIS TREATMENT.
2. DO NOT LEAVE CONSTRUCTION EQUIPMENT RUNNING (IDLING) UNDER TREE CANOPY.

TREE PROTECTION
ZONE
FENCING