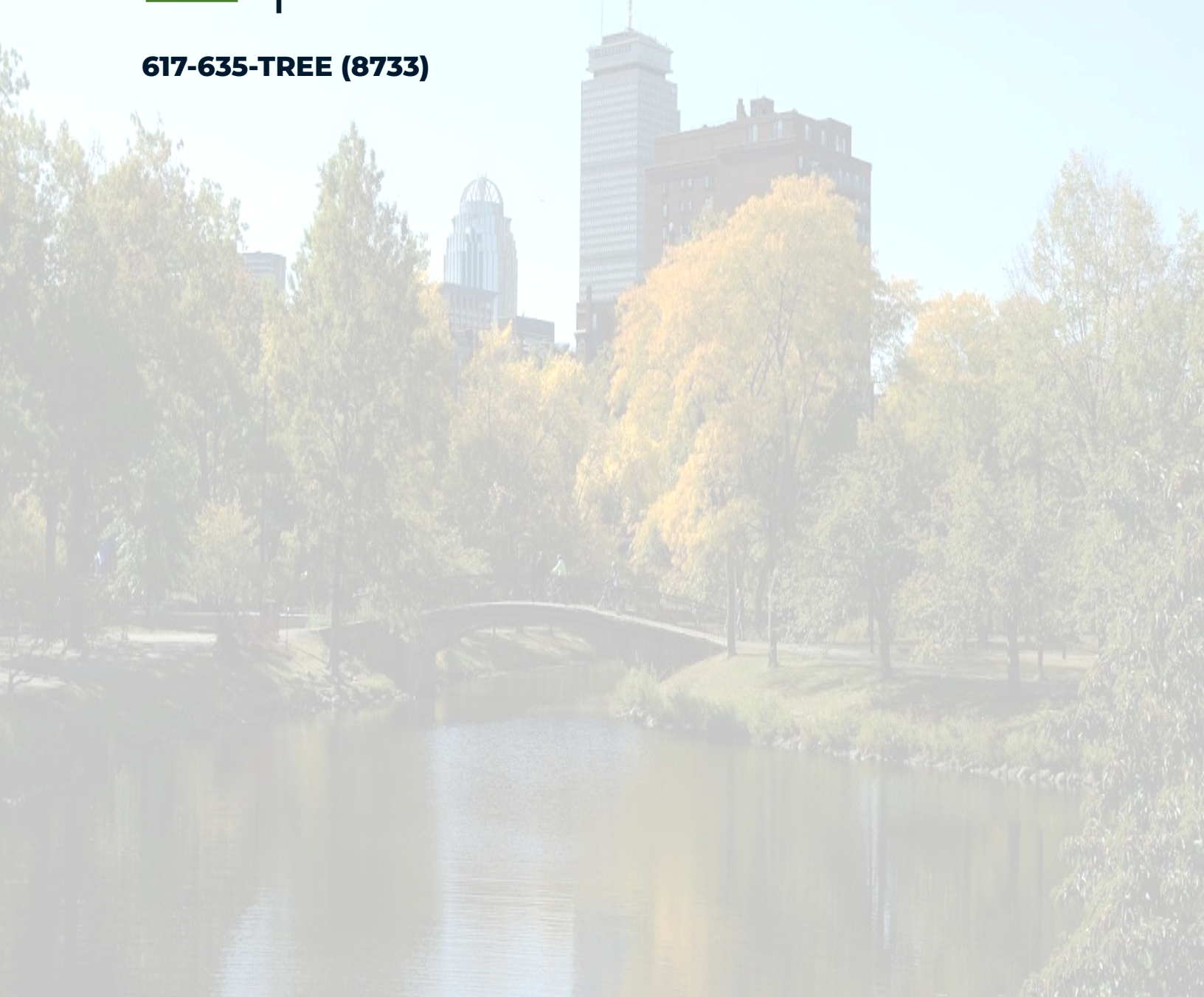
CITY of BOSTON

TREE PROTECTION STANDARDS

Parks and Recreation
Urban Forestry Division

617-635-TREE (8733)



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(617) 635-TREE (8733)
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1 GENERAL OVERVIEW

This manual establishes the tree protection standards that shall be followed when performing work near public shade trees and City property trees in the City of Boston. Trees located within the public right-of-way are protected under Massachusetts General Law Chapter 87 throughout the Commonwealth of Massachusetts. Effective March 2024, trees located on property owned by the City of Boston and its agents that are greater than three (3) inches in diameter are protected under the City of Boston Public Tree Ordinance.

Tree protection practices shall be determined based on the type and extent of work:

- **Construction activity within the Critical Root Zone (CRZ)** requires installation of tree protection fencing and trunk protection in accordance with this manual. Fencing is required in all instances where construction occurs within the CRZ unless the specific conditions outlined in the City's Street Tree Field Guide for surface sidewalk work are fully met.

- **Surface sidewalk work only** (e.g., panel replacement without excavation or grade changes) shall follow the Street Tree Field Guide requirements when applicable. If Field Guide criteria cannot be met, full tree protection fencing and CRZ protection standards described in this manual shall apply.

For project specific requirements, refer to the approved project plan set and all reference documents included in this standard.

1.1. DEFINITIONS

Aeration: The introduction of air into a material, like soil.

Arborist: A person with demonstrated knowledge in the field of arboriculture who has an active certification from the International Society of Arboriculture (ISA), or Massachusetts Arborist Association (MAA).

City Arborist: An arborist currently employed by the City of Boston Parks and Recreation Department within the Urban Forestry Division.

City of Boston Tree Ordinance: An ordinance adopted by City Council and signed by Mayor Wu in December of 2023, having taken effect in March of 2024. This ordinance added protections to all trees greater than three inches in diameter which are located on property owned by the City of Boston and its agents. For further information, please reference the full Public Tree Ordinance.

City of Boston Agents: Includes, but is not limited to, the Boston Housing Authority, Boston Public Schools, Boston Public Library, Boston Public Facilities, Boston Water & Sewer Commission, and additional City departments/agencies.

Contractor: The company hired to manage, administer, and perform the contracted construction work on City of Boston property.

Contract Arborist: A private contractor meeting the aforementioned Arborist definition who has been hired by the Project Manager or Contractor with the intent of inventorying, protecting, maintaining and monitoring public trees during the construction process.

City Property Tree: A tree located on property owned by the City of Boston, including trees in City parks, trees on land under the ownership or jurisdiction of the Boston Water and Sewer Commission, the Boston Housing Authority, Boston Public Schools, or the Boston Redevelopment Authority d/b/a the Boston Planning and Development Agency and any of their successors, and trees on the grounds of other City buildings. City Property Trees do not include Public Shade Trees as defined by M.G.L. c. 87 sec. 1, which are governed under M.G.L. c. 87, trees that are located on City-owned properties subject to a ground lease held by a non-City entity other than the Boston Housing Authority, or trees on the grounds of buildings leased by the City over which the City has authority under the terms of the lease

Critical Root Zone (CRZ): The CRZ is the area of soil immediately surrounding the tree trunk containing roots with the greatest significance to tree health. The Critical Root Zone (CRZ) extends outward from the trunk in all directions, equal to 1 foot for every inch of trunk diameter measured at breast height (DBH). Contractors must notify and coordinate with the City Arborist 2 weeks prior to performing excavation or construction work within the CRZ. *Also see: Diameter at Breast Height (DBH) and Tree Protection Zone (TPZ).*

> *Example: A 20" DBH tree shall have a TPZ of 20' in radius surrounding the tree trunk (20" DBH x 1' Tree Protection Factor = 20' radius CRZ).*

Diameter at Breast Height (DBH): A standardized measure of a tree trunk's diameter measured at 4.5 feet above grade, alternatively referenced as Diameter at Standard Height (DSH).

Field Engineer: The primary civil engineer designated by the City of Boston Public Works Department who is in charge of the day-to-day oversight, inspection and implementation of a public infrastructure project.

Massachusetts General Law Chapter 87 (MGL CH 87): A section of the Massachusetts General law which regulates any work on public shade trees. For more information, see the full Massachusetts General Law, Chapter 87.

Planting Strip: An unpaved, permeable area located in the public right-of-way which is suitable for planting trees or contains existing trees.

Project Area: The physical extent of a construction project site, as determined by the Project Manager, established for the duration of construction, undertaken by the City of Boston or its agents.

Project Manager: The person in overall charge of the planning and execution of a particular project who is typically employed by the City of Boston.

Protected Tree: Any public right-of-way tree or any tree greater than 3 inches DBH on City of Boston property within the Project Area, or that may be affected by the Project Area construction, which has not been designated for removal, and for which precautions must be taken to ensure its existing health and survival throughout the course of a construction project.

Pruning: The process of cutting and removing any material from a tree, such as branches and roots, performed by an Arborist with the proper approval from a City Arborist.

Public Right-Of-Way (ROW) Tree: *Also referenced as: Public Shade Tree.* Any tree regardless of diameter that is located within the boundaries of the public right-of-way is subject to

both Massachusetts General Law Chapter 87 as well as the City of Boston Public Tree Ordinance and Tree Protection Standards.

Root flare: The area at the base of a tree where the trunk expands and transitions into the roots. It is the part of the tree that should be visible above ground, where the trunk starts to spread out into the root system.

Structural Root Zone (SRZ): The SRZ is the area of soil immediately surrounding the tree trunk containing roots with the greatest significance to the tree's structural stability. The SRZ extends outward from the trunk in all directions, equal to 1/2 foot for every inch of trunk diameter measured at breast height (DBH). Disturbance, cutting of roots or excavation causing root loss within this zone, can severely compromise a trees stability and drastically increases the potential of whole tree failure. No tree roots shall be removed from within the SRZ without written approval from the Tree Warden or City Arborist.

Tree Pit: A designated area of soil, typically surrounded by pavement or concrete, where a street tree is planted, or could be planted, which provides the space for the tree's root system to develop and access essential nutrients and water.

Tree Protection Zone (TPZ): The designated area around a tree where all parts of the tree and its soil must be protected during construction. It is defined as 1.5 feet from the trunk for every inch of trunk diameter at breast height (DBH). See also: DBH and Critical Root Zone (CRZ).

> *Example*: A 20" *DBH tree must have a TPZ of* 30' *in radius surrounding the tree trunk (*20" *DBH x* 1.5' *Tree Protection Factor* = 30' *TPZ).*

Tree Damage: Physical injury and/or tissue loss to a Protected Tree, or damage to the soil profile inside a Protected Tree's TPZ resulting from any action that did not have prior approval from a City Arborist.

Tree Hearing: A required public hearing process under MGL Chapter 87 before removing any live, healthy public shade tree, regardless of size..

Tree Community Meeting (or Tree Meeting): A process followed in accordance with the City of Boston Public Tree Ordinance, which requires that trees located on City of Boston owned property greater than 3 inches DBH that are alive and healthy as determined by an Arborist, have a public meeting held prior to their removal.

Tree Removal (Public ROW Tree): Any Public ROW Tree that has been designated and approved for removal through a Tree Hearing, or by the Tree Warden or their designee. The Tree Warden may designate a Public ROW Tree for removal without a Tree Hearing due to the tree being dead, dying, or diseased; posing a risk to persons and/or property; determined to be an invasive tree species; or for the suppression of pests.

Tree Removal (City Property Tree): Any tree on City Property that has been designated and approved for removal through a Tree Community Meeting, by the Tree Warden, by a City Arborist, or by a Contract Arborist. A City Arborist or Contract Arborist may designate a tree on city property for removal without a Tree Community Meeting if the tree in question is dead, dying, diseased; posing a risk to persons and/or property; determined to be an invasive tree species; or for the suppression of pests.

Tree Warden: The primary City Arborist designated by the Boston Parks and Recreation Department Commissioner who is in charge of all trees located within the public right-of-way and tasked with enforcing and ruling on issues related to Protected Trees, Massachusetts General Law Chapter 87 and the City of Boston Public Tree Ordinance.

1.02 TREE PROTECTION INTENT

The purpose of providing detailed best management practices for Protected Trees is to comply with local and state requirements, and to ensure Contractors minimize the negative impacts of construction to existing Protected Trees.

The City of Boston Tree Ordinance took effect in March of 2024. This ordinance added protections to all trees greater than three inches in diameter which are located on property owned by the City of Boston and its agents. For further information, please reference the full Public Tree Ordinance.

Additionally, Massachusetts General Law Chapter 87 (MGL CH 87) is a section of the Massachusetts General law which regulates any work on public shade trees. For more information, see the full Massachusetts General Law, Chapter 87.

Examples of Tree Damage to prevent, limit and/or mitigate include:

A. Physical injury to the trunk and/or crown from construction equipment, material storage, or vehicles.

B. Damage to leaves and twigs from exposure to heat and fumes due to construction equipment and exhaust running in close proximity to the canopy of trees.

C. Soil compaction in the root zone from storage of materials and machinery/vehicles traveling or parking over root systems inside the TPZ.

D. Severing and/or damaging of roots with excavation equipment inside of the TPZ and/or pulling feeder roots at excavation edge with backhoe or excavator.

E. Smothering roots with added soil and/or fill by increasing grades over the TPZ which was not previously reviewed and approved.

F. Reduction or loss of tree stability due to grade reduction, root loss or root damage which have not been previously reviewed and approved.

G. Split or broken branches caused by construction vehicles or excavation equipment.

H. Dust/debris on leaves remaining for more than two weeks in the absence of significant rainfall.

I. Construction debris or pollutants being dumped, spilled, or stored inside the TPZ.

2. TREE PROTECTION STRATEGIES

This section provides guidance on general tree protection strategies for projects which have the potential to impact Public ROW Trees and trees on Public Property. Depending upon the specific scope of work for the project, more requirements may be necessary.

2.1. TREE PROTECTION FENCING

2.1.1. SPECIFICATIONS

1. General Requirements

Tree protection fencing is required whenever construction activities occur within the Tree Protection Zone (TPZ). Fencing must fully encapsulate the TPZ whenever site conditions allow. When construction or existing infrastructure prevents full TPZ fencing, the Critical Root Zone (CRZ) must be protected. Fencing should be positioned as close to the CRZ edge as possible and approved by a City Arborist.

2. Fencing Specifications

- Minimum six (6) foot tall chain link fencing mounted on two-inch diameter galvanized steel poles, driven at least two (2) feet into the ground.
- Maximum spacing between posts: eight (8) feet.
- Alternative mounting methods, such as prefabricated panels on temporary movable bases, may be used if driving posts is not feasible and must be approved by the City Arborist.
- Orange plastic fencing is not permitted.

3. Installation and Approval

- Locations of tree protection fencing must be reviewed and approved in the field by the Project Manager/Field Engineer, City Arborist, and Landscape Architect before installation.
- Trees to remain, be removed, or pruned must be clearly flagged before fencing is erected.
- Approved fencing must be installed before any construction activity begins or any materials are brought on site. Fencing must remain vertical and intact throughout the project. Any temporary removal or relocation requires prior approval from the Project Manager and Contract Arborist.
- An accessible path of travel must be maintained throughout all construction/maintenance activities.

4. Trunk Protection
See section 2.1.2. Trunk protection is supplemental and does not replace TPZ fencing unless explicitly approved by the City Arborist.

5. Construction Restrictions

- No material storage, construction, or demolition may occur within the TPZ without approval of a City Arborist.
- Tree protection fencing must be removed and properly disposed of at the end of construction. The protected area will be reviewed for final acceptance by the Project Manager and City Arborist.

6. Reference
See Appendix A for additional guidance and illustrations (Figures TP 1.1 and TP 1.2) showing proper fencing placement relative to the TPZ and CRZ.

Tree protection should be installed whenever construction is within the CRZ.

2.1.2. TRUNK PROTECTION

Trunk protection is always required when working within the CRZ.

When protecting a tree you may either:

- Install vertical 2x4 boards from ground level to at least 8 feet in length with a maximum spacing of 2” between each board without nails or fasteners penetrating the tree; or
- Install corrugated PVC tubing encompassing the tree's circumference.

Trunk Protection shall be one of two materials:

A. Type 1: Corrugated plastic tubing that is 4" greater in diameter than the tree's DBH, cut in half and placed on either side of the tree trunk so that the trunk is fully enclosed within the tubing. The two halves of the pipe shall be secured with metal strapping to prevent injury from construction equipment and activities. See Figure TP 1.1 in Appendix A.

B. Type 2: 2" (two inch) by 4" (four inch) #1 grade natural pine or spruce boards spaced no more than two inches apart secured with metal strapping.Trunk protection must include two inch (2") by 4"four inch 4" first (1) grade natural pine or spruce boards, spaced no more than two (2) inches apart, and secured with metal strapping. The boards must be laid vertically over the trunk to prevent injury from construction equipment and activities. Care must be taken to ensure that no damage is incurred to the tree trunk. Trunk protection fasteners shall not be attached into the trunk of the tree that is being protected. See Figure TP 1.1 in Appendix A.

Trunk protection must remain and be maintained as approved until final acceptance and permission to remove is granted by the Project Manager and Contract Arborist.

See Appendix A for further information.

2.1.3. ROOT PROTECTION

If standard tree protection cannot be installed due to site conditions, as determined by the City Arborist or their designee, a temporary 6" layer of wood chips shall be applied with ¾" steel plates or road mats on top of chips to mitigate soil compaction to the TPZ. Wood chips from trees removed due to disease must not be permitted to be spread on site.

AirSpade equipment (or an equivalent air excavation tool) must be used to expose tree roots in excavation areas within the CRZ. A vacuum truck (vac truck) can be used in conjunction with the airspade to expose tree roots. The air excavation tool must be equipped with a toggle switch and wand specifically designed to excavate gently enough to aerate and expose roots, locate roots, and perform root collar excavation, but tough enough for trenching and digging safely around plantings and tree root systems. The air excavation tool must utilize a nozzle and extra-long hose with 45-degree angled adapter that generates 150 CFM of air, moving at 90 PSI, connected to a compressor rated to 150 CFM and 100 PSI.

Exposed roots shall not remain uncovered for longer than twenty-four (24) hours without treatment. Do not allow roots to dry out in heat or sun, or freeze in cold weather. To prevent exposed tree roots from becoming dehydrated, projects must apply fine-grade hydrogel to tree roots that are exposed by air excavation or hand digging within 24 hours of exposure. To prepare the hydrogel, mix 15 ounces of fine-grade powder with 25 gallons of clean, drinkable water. Stir thoroughly, then let the mixture sit in clean buckets for one hour until it forms a slurry. Apply the slurry directly to the exposed roots.

If hydrogel is not available, the contractor must cover exposed roots in heavy-duty burlap and soak with water twice daily throughout the project's duration until the tree well can be backfilled. Remove the burlap before backfilling around the roots.

2.1.4.ROOT PRUNING

Where root pruning is required and approved by the City Arborist, exposed roots will be hand cut with sanitized, sharp shears or a hand saw within 24 hours of being exposed.

If any roots two inches (2”) in diameter or greater are uncovered during demolition or excavation these roots must be reviewed by the Contract Arborist upon discovery. If the Contract Arborist deems root pruning is required to proceed, then the identified roots must be reviewed and approved for removal by a City Arborist. To schedule a root inspection, contact the Urban Forestry Division by either emailing Trees@Boston.gov or calling (617) 635-TREE (8733).

In no case shall more than 25% of a tree's Critical Root Zone (CRZ) be disturbed or cut.

3. WORKING IN THE CRZ

Any work inside the established CRZ requires prior approval from a City Arborist. The Project Manager/Field Engineer shall notify the Urban Forestry Division in advance of any proposed work within the CRZ by emailing trees@boston.gov. All approved excavation and demolition within the CRZ must exclusively be undertaken using hand tools or air excavation *only*.

Digging by backhoe or heavy machinery in the TPZ or CRZ is not permitted until all roots are exposed via air excavation and approved for cutting by a City Arborist. Backhoe digging rips and damages root systems far beyond the limit of excavation and increases the likelihood of future issues with pests, disease, and tree stability. If digging occurs before a City Arborist has approved of root pruning, then the project is subject to fines. -*The use of mechanical or hydraulic tools is not permitted within the CRZ for purposes of demolition, trenching, or excavation, unless approved in advance by a City Arborist. The storage of heavy equipment and of any materials, or parking of vehicles, shall not be permitted within the TPZ of any tree to remain during construction.*

If major roots are in the way, pipes and conduits must be placed by hand under or between the roots whenever possible to avoid cutting them. Within the Tree Protection Zone (TPZ) of a protected tree, directional boring may also be used. For more details, refer to the latest edition of Best Management Practices – Managing Trees During Construction (Matheny et al).

3.1 FILLING OVER ROOTS TO REMAIN

Exposed roots must be promptly covered as described in Section 2.1.3. Fill is not allowed within the CRZ of a Protected Tree unless it is specifically to re-cover exposed roots or has been approved by the City Arborist. If filling is permitted, apply no more than six inches of approved loam or structural soil, and never within 12 inches of the root flare.

3.2 PREVENTING INJURY FROM EXHAUST

Prolonged exposure to exhaust from construction equipment to the canopy of any Protected Tree must be prevented throughout construction. Vehicles and machinery will be positioned to prevent exhaust from blowing directly onto the canopy of a tree while being operated. Special attention should be paid to the positioning of equipment that will be stationary for prolonged periods, such as generators and vac-trucks, as well as equipment that may sit idling for extended periods of time.

3.3 PREVENTING INJURY TO TREE LIMBS FROM EQUIPMENT

Contact with tree limbs from equipment such as excavators, vac trucks, cranes, dump trucks, boom lifts and material lifts, as well as moving vehicles, can cause irreparable structural damage to a tree. Aboveground equipment contacting the canopy of a Protected Tree must be avoided throughout construction.

Site preparations to prevent injury to the canopy of Protected Trees, such as the pruning of Protected Trees for anticipated clearance needed for equipment during construction must be completed prior to the arrival of any materials or equipment on site. A request to prune any Protected Trees must be submitted to a City Arborist two weeks prior to the anticipated commencement of work on site. Once a City Arborist has approved the pruning request, the Contractor must hire a private tree care company, with a Certified Arborist on staff, to complete the pruning work approved by the City Arborist.

If a limb on a Protected Tree is too large to prune without harming the tree's health, it must be protected from potential damage. In these cases, the project must install protection around the limb using the same method as trunk protection outlined in Section 2.1.2.

4. SITE VISITS

The Contractor must arrange for site visits to review individual trees that may need special treatment as site preparation and clearing occurs. The first site visit must occur before demolition of existing features or the arrival and/or installation of any materials on site to review and approve the tree protection installed in the field.

The Contract Arborist must approve of any changes to the Tree Protection prior to it being altered. All changes to Tree Protection must be approved City Arborist.

5. DAMAGE REPORTING AND MITIGATION

Any tree damage inside the construction zone or nearby right-of-way that could create a safety hazard must be reported immediately to a City Arborist by the Contract Arborist or Project Manager.

If the damage was caused by the Contractor's work, the Contractor must fix the problem at their own expense and with City Arborist approval, ensuring no further risk to people or property. The City will not cover these costs.

The Contractor, Contract Arborist, or Project Manager must report any damage to tree branches or canopies caused by construction equipment to the City Arborist within 24 hours. The Contractor and their Contract Arborist must repair this damage within two weeks at no cost to the City. Repairs must follow ANSI A300 pruning standards—wound sealants are not allowed.

5.1. Liability for Damage to Protected Trees During Construction

The Contractor is liable for any damage to existing trees during construction that are protected or inside of tree protection fencing, and have not been designated for removal.This damage is called Tree Damage. Penalties for Tree Damage shall be in accordance with the fines defined herein.

A City Arborist will assess if the Tree Damage has or will significantly impact the stability, health and/or viability of the tree in question. If a tree has been damaged beyond repair, the Contractor will be assessed for the damage to the Protected Tree.
Fines for a damaged tree(s) which requires removal will be charged at a rate of not less than five hundred and fifty dollars ($550.00) per inch of DBH. Removal of any trees which

have been damaged beyond repair is the responsibility of the Contractor at no additional cost to the City of Boston.

If Tree Damage requires removal of a protected tree, the contractor will replace the tree at no cost to the City and will maintain a warranty for the new tree for the term of 2 years. The 2 year term will be determined by contact terms. Maintaining the replaced trees includes, but is not limited to: mulching, watering, weeding, and installing supplement tree support.

Assessed fines for replacing all trees damaged beyond repair will be the replacement value for the DBH of the tree damaged. Replacement trees must be between 2 and 4 inches in caliper (trunk diameter). The City Arborist will decide the species and planting locations for all replacement trees.

All expenses and remediation related to pruning tree branches damaged by construction are the responsibility of the Contract Arborist. Pruning must follow ANSI A300 standards and will be done at the Contractor's expense. Damage to branches of any size will be fined at $500 per instance, with the penalty paid by the Contractor.

Tree bark that is damaged by construction activities shall be repaired with wound trace cutting. Wound trace cutting requires a clean knife or chisel to live cambium (wood found below the bark) by the Contract Arborist at the Contractor's expense. Damage to the bark of any protected tree that is to remain standing will result in a $500 fine per incident, to be paid by the Contractor.

Removing or moving tree protection fencing for a protected tree—even temporarily—is not allowed without prior approval from the Project Manager and Contract Arborist, even if no tree damage occurs.

Unauthorized activities inside the Tree Protection Zone (TPZ) will result in a minimum $500 fine per instance, to be paid by the Contractor. Prohibited actions include:

- Storing construction equipment or machinery
- Storing construction materials
- Stockpiling soil
- Dumping debris
- Cleaning out concrete washouts
- Fueling vehicles or equipment

6. PROJECT MAINTENANCE AND SITE MITIGATION

6.1 TREE PRUNING

1. Approval Requirements

- Any pruning of a Public Right-of-Way (ROW) tree requires prior approval from a City Arborist.
- The Project Manager, Field Engineer, or Contract Arborist must notify the Urban Forestry Division a minimum 2 weeks in advance by emailing trees@boston.gov.
- A City Arborist will review the proposed scope of work and provide guidance before pruning begins.

2. Pruning Standards

- All pruning must comply with the current ANSI A300 standards..

3. Responsibilities

- The Contract Arborist is responsible for performing all pruning work.

4. Scope of Pruning

- Light canopy raising
- Removal of deadwood
- Removal of broken branches

5. Unscheduled Pruning

- Additional pruning may be required if trees are damaged by storms or other events during construction.
- The Field Engineer will notify the Parks Department preemptively if additional pruning is needed to maintain tree health and public safety.

6. Post-Construction Pruning

- The Contract Arborist must conduct a follow-up inspection one year after construction is completed.
- As needed, pruning may be performed to remove deadwood or address damage caused by wind or construction-related root stress.

7. Seasonal Restrictions

- Pruning of elm trees shall only be allowed from November 1 to March 1.

- Removal of dead or hazardous branches may occur outside of this window if immediate safety concerns exist.

8. Disposal of Pruned Material

- All pruned material must be legally disposed of offsite by the Contractor or Contract Arborist.

6.2 TREE PIT AND ROOT PROTECTIONS

Existing tree pits of protected trees to remain must be mulched with three inches of approved, shredded bark mulch before construction/demolition commences. Tree pits that once included granite cobbles or bricks must have approved planting loam spread over exposed roots to original finished grade, to be adjusted to final grades.

In areas where tree protection fencing cannot be installed to encapsulate the full CRZ due to conflicts on site, a temporary 6" layer of wood chips shall be applied with ¾" steel plates or road mats on top of chips to mitigate soil compaction to the TPZ. Wood chips from trees removed due to disease must not be permitted to be spread on site.

Tree pits shall be deep root watered weekly with potable water, soaking the soil in the tree pit to a minimum depth of 12 inches between April 15 – October 15 unless 1 inch of rain has fallen during the preceding week. In this case, watering may not be required. Best judgement should be used.

All materials and debris from sidewalk demolition must be removed from the TPZ as soon as possible, or at a minimum within 24 hours after demolition. Concrete dust must be blown clean from top and out of the proposed tree pit and planting strip limits. This ensures that the pH is not inadvertently increased in the soil due to the concrete dust leaching into the soil around the roots. Tree pits and proposed planting strips must be watered thoroughly within 24 hours after cleanup of concrete debris and dust.

Heavy equipment, storage of any materials, or parking of vehicles shall not be permitted within the TPZ of any tree to remain during construction.

6.3 DEEP ROOT AERATION AND LOAMING OF PITS AND ROOT ZONES POST CONSTRUCTION

Proposed soil aeration must be reviewed by a City Arborist before aeration operations begin and must be carried out by or under the supervision of the Contract Arborist. After construction is complete, the tree pits and planting strips shall be deep root aerated to a minimum 12" depth, with holes 12" on center staying 6" - 12" inches from existing tree

trunks and lateral structural roots to remain. Aeration must occur before mulching or loaming of pits and tree ways.

Aeration holes shall be filled with approved compost and be well-watered in. Tree pits and planting strips shall then be loamed with a maximum of 6 inches of approved planting mix (loam) in order to match adjacent grade and mulched with approved mulch to the limits of the tree protection fencing. The tree's root flare shall not be buried by loam or mulch. The finished grade of loam and mulch at the edges of the treated area shall be finished cleanly after fencing is removed for final acceptance by a City Arborist.

6.4 MONTHLY WEEDING

Tree pits and park strips in the project area shall be maintained to be free of weeds and debris at all times during the construction process. A three inch layer of mulch may be applied to assist in the suppression of weeds. In no case shall trees be volcano mulched.

6.5 DUST CONTROL OF TREE CANOPIES IN LEAF

The canopies of protected trees to remain during construction that are in leaf shall be inspected by the Contract Arborist for dust accumulation every two weeks between May 15 – November 15. The Contract Arborist may require that the canopies be regularly sprayed with clean, potable water to clean off the leaves of accumulated construction dust on a regular basis.

If remaining trees display signs of water stress that is not alleviated by watering, the leaves shall be sprayed with an approved anti-desiccant and watering operations reevaluated (possibly increased). This is subject to review and approval by a City Arborist or Contract Arborist.

6.6 INSECT AND DISEASE CONTROL

A City Arborist or Contract Arborist may also recommend approved remedial insect or disease control measures that may be required for trees to remain in order to preserve their health and vigor if they are subject to infestation. Trees to remain shall be inspected for insect and disease controls before, during, and at the end of construction by the Contract Arborist as a condition of acceptance. Recommendations and measures shall be taken to remedy the problems with review and approval of a City Arborist and the Project Manager.

6.7 TREE RECORD MEMORANDUM AND DOCUMENTATION

The Contract Arborist must provide a detailed tree record memorandum with a keyed plan, that documents the condition of the existing trees to remain and be protected after fencing and controls are in place. This plan must include the location and condition of protective fencing during construction.

The Contract Arborist must update the memorandum as a condition of acceptance by documenting any damage, injuries, disease issues, insect problems, or problems due to trees and root reductions that occurred during construction. This will include removals, proposed and completed remedial and maintenance work specific to individual trees with photo and written documentation, dates of work, materials used, and personnel who did the work. The Contractor or Contract Arborist will provide this detailed memorandum of the trees that were protected and maintained during construction to a City Arborist and Project Manager as a condition of acceptance at the conclusion of the project.

6.8 PROJECT MAINTENANCE

Maintenance shall extend to the end of construction as a condition of final acceptance.

7. APPLICABLE STANDARDS

American National Standards Institute (ANSI). (Current Revision). Parts 1, 2, 3, 5, 6, 8, 9 & 10. ANSI A300 Tree Care Standards for Trees, Shrubs, Palms and Other Woody Landscape Plants.: treecareindustryassociation.org Tree Care Industry Association (TCIA).

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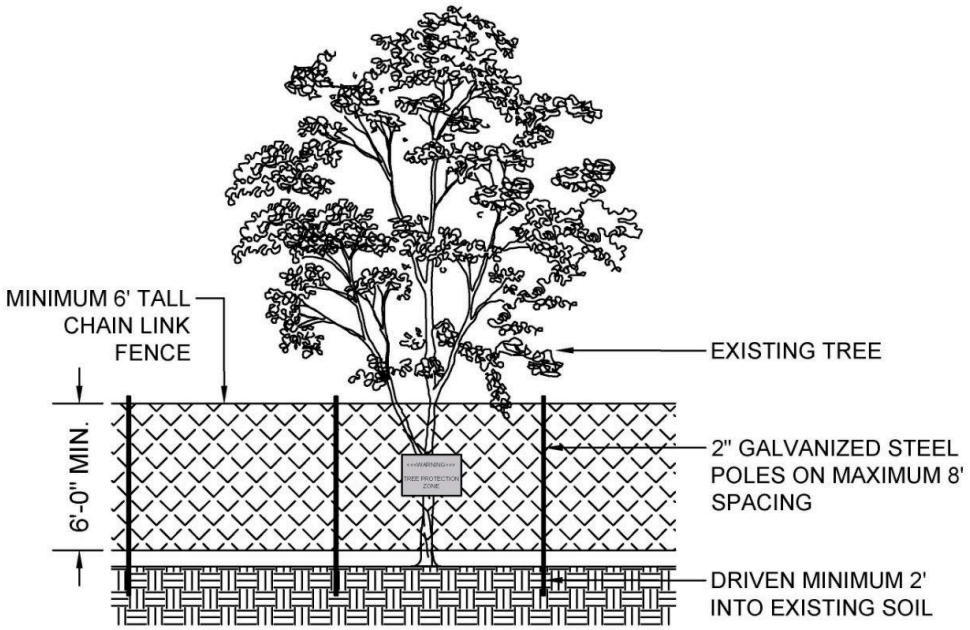
APPENDIX A: TREE PROTECTION DETAILS

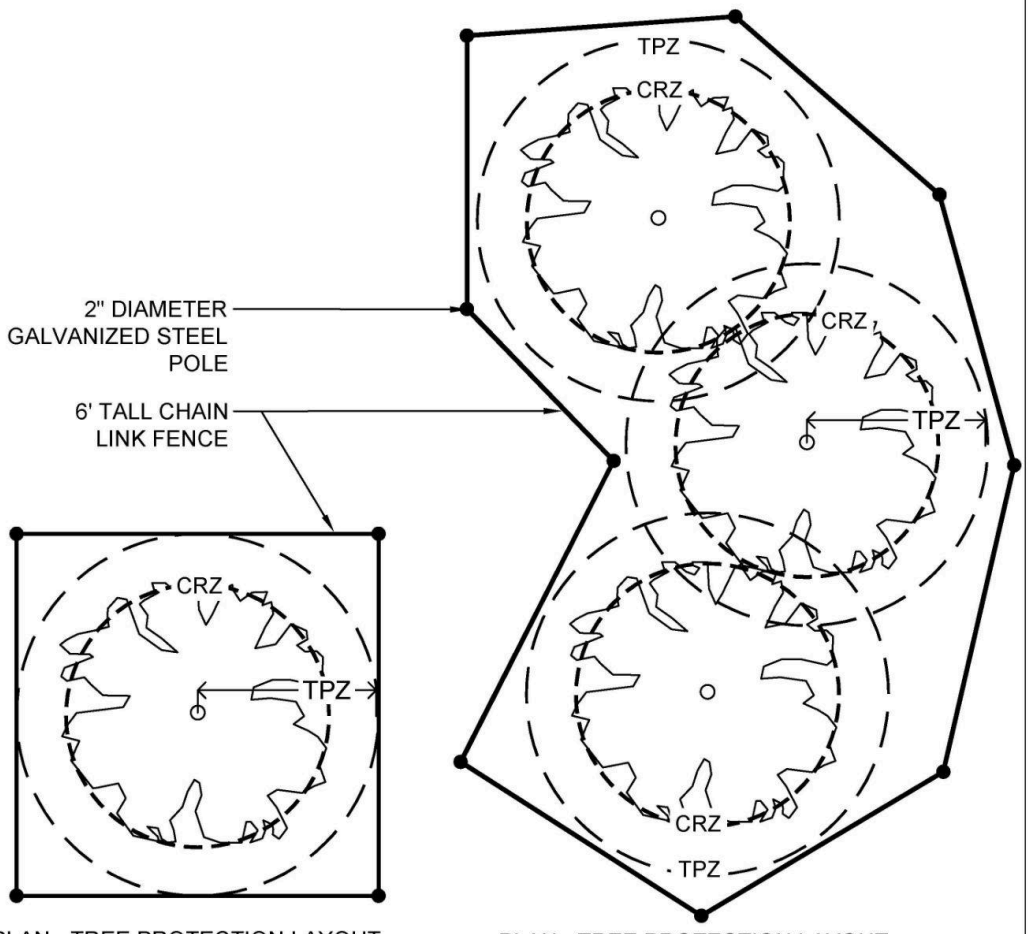


ELEVATION

NOTES:

1. TREE PROTECTION IS REQUIRED FOR ALL PUBLIC SHADE TREES AND ALL TREES LOCATED ON PUBLIC PROPERTY WHICH ARE ON OR ADJACENT TO A SITE UNDERGOING CONSTRUCTION ACTIVITIES. TREE PROTECTION SHALL BE INSTALLED PRIOR TO THE ARRIVAL OF ANY CONSTRUCTION MATERIALS OR THE COMMENCEMENT OF ANY WORK ON SITE.
2. TREE PROTECTION FENCING SHALL CONSIST OF 6' (SIX FOOT) TALL CHAIN LINK FENCING MOUNTED ON 2" (TWO INCH) GALVANIZED STEEL POLES DRIVEN 2' INTO THE EXISTING SOIL WITH A MAXIMUM OF 8' SPACING BETWEEN POLES.
3. FENCING SHALL BE PLACED AT THE EDGE OF THE TPZ OR CRZ AS DEFINED IN THE CITY OF BOSTON TREE PROTECTION STANDARDS.
4. WHEN UNABLE TO INSTALL FENCING TO THE FULL EXTENT OF THE TPZ A 4"- 6" LAYER OF MULCH SHOULD BE APPLIED WITH 3/4" PLYWOOD OR ROAD MATS LAID ON TOP TO PREVENT SOIL COMPACTION AND ROOT DAMAGE.
5. CITY OF BOSTON STANDARD TREE PROTECTION SIGNS (FIG. TP 1.5) SHALL BE SECURELY AFFIXED TO FENCING AT A MINIMUM OF EVERY 20' THROUGHOUT CONSTRUCTION.
6. WHEN UNABLE TO DRIVE STEEL POSTS INTO THE EXISTING SOIL, ALTERNATE MOUNTING OPTIONS MAY BE UTILIZED IF APPROVED BY THE PROJECT MANAGER OR CITY ARBORIST.

FIGURE: TP 1.1	**TREE PROTECTION DETAIL - ELEVATION** URBAN FORESTRY DIVISION REV. 10/23/25	City of Boston Parks and Recreation



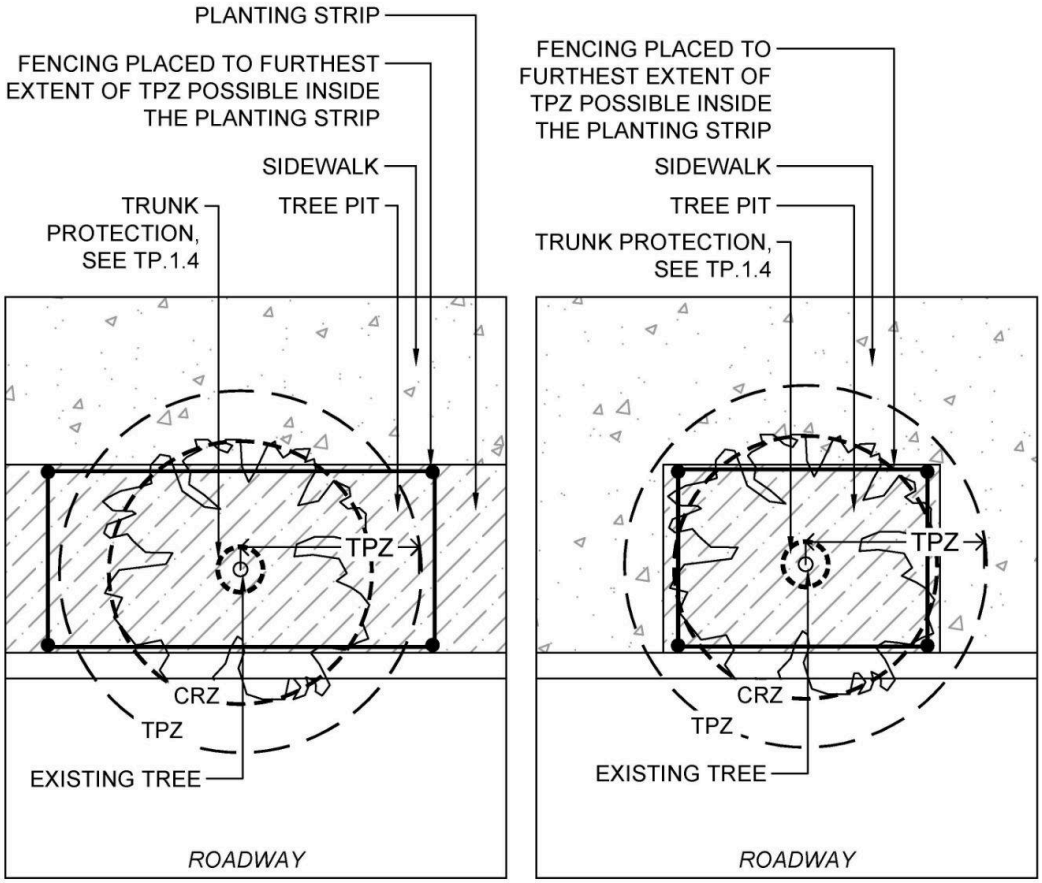
PLAN - TREE PROTECTION LAYOUT FOR SINGLE TREE

PLAN - TREE PROTECTION LAYOUT FOR MULTIPLE TREES

NOTES:

1. TREE PROTECTION FENCING SHALL BE PLACED AT OR AS CLOSE TO THE EDGE OF THE TREE PROTECTION ZONE (TPZ) OR CRITICAL ROOT ZONE (CRZ) AS POSSIBLE AS DEFINED IN THE SPECIFICATIONS.
2. ALL TREE PROTECTION FENCING SHALL MEET ALL REQUIREMENTS AS DEFINED IN FIGURE TP 1.1.
3. TREE PROTECTION FENCING SHALL BE INSTALLED TO FULLY ENCAPSULATE EITHER THE FULL TPZ OR CRZ OF A SINGLE TREE, OR THE ENTIRE TREE PROTECTION ZONE OF A CLUSTER OF MULTIPLE TREES.
4. NO TREE PROTECTION FENCING IS NEEDED IN BETWEEN INDIVIDUAL TREES WHEN PROTECTING AN ENTIRE CLUSTER OF TREES.

FIGURE: TP 1.2	**TREE PROTECTION FENCE (PLAN)** DESIGN AND CONSTRUCTION DIVISION REVISED 10/23/25	City of Boston Parks and Recreation

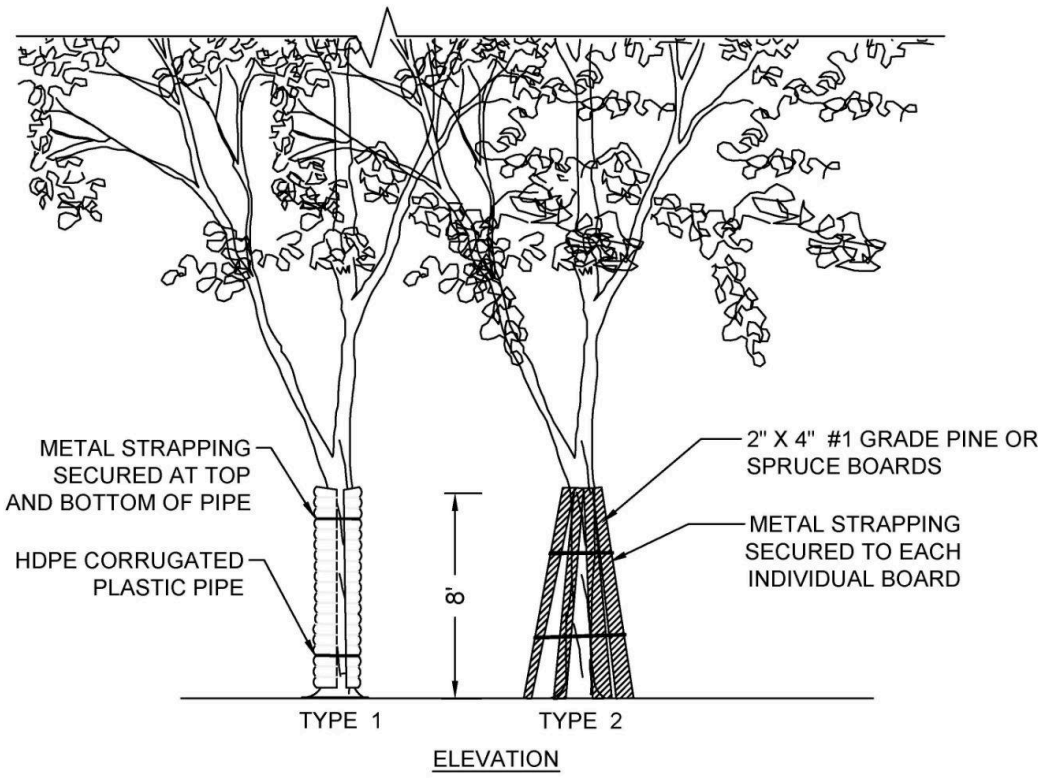


NOTES

1. ALL TREE PROTECTION FENCING SHALL MEET ALL REQUIREMENTS AS DEFINED IN FIGURE TP 1.1.
2. TREE PROTECTION FENCING SHALL BE PLACED AT THE EDGE OF THE TREE PROTECTION ZONE (TPZ) OR CRITICAL ROOT ZONE (CRZ) AS DEFINED IN THE SPECIFICATIONS.
3. WHEN NOT ABLE TO INSTALL FENCING TO FULL EXTENT OF TPZ SUCH AS IN TREE PITS AND PLANTING STRIPS, FENCING SHALL BE PLACED TO FURTHEST EXTENT POSSIBLE AND A 4-6" LAYER OF MULCH SHOULD BE APPLIED TO EXPOSED SOIL INSIDE THE TPZ, BUT OUTSIDE OF THE FENCING, WITH 3/4" PLYWOOD OR ROAD MATS LAID ON TOP TO PREVENT SOIL COMPACTION AND ROOT DAMAGE. MULCH LAYERS ARE NOT NEEDED IN AREAS WHERE THERE IS EXISTING HARDSCAPE TO REMAIN.
4. TRUNK PROTECTION IS REQUIRED. REFER TO DETAIL TP.1.4.

FIGURE: TP 1.3	**TREE PROTECTION FENCING AREA** URBAN FORESTRY DIVISION REVISED: 10/23/25	City of Boston Parks and Recreation

(617) 635-TREE (8733)
Trees@Boston.gov



ELEVATION

NOTES:
1. TRUNK PROTECTION IS REQUIRED FOR ALL EXISTING TREES TO REMAIN.
2. TRUNK PROTECTION SHALL CONSIST OF TYPE 1 OR TYPE 2 TREE PROTECTION AS SHOWN ABOVE.
3. TYPE 1 SHALL BE DUAL-WALL HDPE CORRUGATED PLASTIC PIPING CUT IN HALF AND SECURED WTIH METAL STRAPPING AT THE TOP AND BOTTOM OF THE PIPE. THE DIAMETER OF THE PIPE SHALL BE 4" GREATER THAN THE TREE'S DIAMETER AT BREAST HEIGHT.
4. TYPE 2 SHALL BE 2" X 4" #1 GRADE PINE OR SPRUCE BOARDS LAID VERTICALLY OVER THE TRUNK, SPACED NO MORE THAT TWO INCHES APART AND SECURED TOGETHER WITH METAL STRAPPING. NO FASTENERS SHALL BE ATTACHED DIRECTLY INTO THE TREE.
5. TRUNK PROTECTION SHALL BE 8' HT. IF BRANCHING PROHIBITS TRUNK PROTECTION TO FULL 8' HT, CONTRACTOR SHALL CONTACT CITY ARBORIST FOR ALTERNATE HT.

FIGURE: TP 1.4	**TRUNK PROTECTION DETAIL** URBAN FORESTRY DIVISION REVISED 10/23/25	City of Boston Parks and Recreation

1. CITY OF BOSTON STANDARD TREE PROTECTION SIGNS SHALL BE SECURELY AFFIXED TO FENCING EVERY 20' MINIMUM THROUGHOUT CONSTRUCTION.
2. TREE PROTECTION SIGNS ARE TO BE A MINIMUM OF 8.5" X 11" IN SIZE.
3. IF SIGNS BECOME DAMAGED OR DEGRADED DURING CONSTRUCTION THEY MUST BE PROMPTLY REPLACED.
4. TREE PROTECTION SIGNS ARE NOT TO BE REMOVED UNTIL PROJECT COMPLETION WHEN FENCING IS BEING REMOVED.
5. FOR FURTHER INFORMATION REFERENCE THE CITY OF BOSTON PARKS & RECREATION DEPARTMENT'S TREE PROTECTION STANDARDS.

FIGURE: TP 1.5	**TREE PROTECTION FENCING SIGN** URBAN FORESTRY DIVISION REV. 4/19/24	City of Boston Parks and Recreation