

Standard Specifications for Public Works Projects (2026 Proposed Revisions)

107.13 Tree Protection Specifications.

These specifications shall be applicable to all Contractors working in the Public Right of Way, whether by permit, Public Works Contract, Developer Agreement or any other permission to work within the Public Right of Way. However, any Contractor doing work related to an emergency situation as described in Sections 10.05(13)(a) and 10.101(5) of the Madison General Ordinances are not bound by these provisions for those situations only. The term “Contractor” shall also mean ‘Permit Grantee’ or anyone given permission to work in the Public Right of Way, regardless of whether a permit is obtained or granted. For the purposes of these specifications, “Public Right of Way” shall include any property that the City of Madison has an ownership interest in, including, without limitation, highways and highway right-of-ways, public walkways and bike paths, parks, greenways and stormwater management areas. Other Sections of the Standard Specifications may repeat portions of this specification for emphasis and / or expand upon these specifications. The specifications found in those other Sections are not intended to conflict with these specifications.

The maintenance and enhancement of the urban forest, in particular the established urban forest, is a goal of the City of Madison. Preserving and protecting healthy trees, especially mature trees, is one objective towards achieving this goal. Trees vary in their ability to adapt to altered growing conditions. Trees have established stable biological systems in the pre- existing physical environment. Disruption of this environment by construction activities interrupts the tree’s physiological processes causing depletion of energy reserves and a decline in vigor, often resulting in the tree’s death. Typically, this reaction may develop from one to twelve years or more after disruption. It could take generations to replace a fully mature tree. These tree protection specifications are intended to insure that appropriate practices will be implemented in the construction phase of the project to protect a tree’s structural integrity and future health and both preserve trees and property value. Also, these specifications will reduce the likelihood of undesirable consequences that may result from uninformed or careless construction practices adjacent to trees. The most common forms of construction damage to trees are:

- Injury to roots, trunk or branches
- Bark or trunk wounding
- Soil compaction which degrades the functioning of roots and inhibits the development of new ones and restricts drainage, which desiccates roots
- Changes in existing grade which can cut or suffocate roots

Damage can be prevented or minimized by following the specifications below and properly educating construction staff of these specifications and use of care when working around trees during the construction process within the Tree Protection Zone. If the City Forester or City Engineer determines that a tree has been damaged due to

failure to follow these specifications, or negligence of the Contractor or Subcontractor, a fine or liquidated damages shall be assessed to the Contractor or permit holder.

For the purposes of this Section 107.13, the definitions set forth in MGO Sec. 10.105(2) apply, including:

DBH or Diameter at Breast Height. which means the diameter of the trunk of the tree measured in inches at a point four and one-half feet above the existing grade at the base of the tree or the Aggregate Diameter of a Multiple Stemmed Tree, rounded down to the nearest inch. This point of measurement is used for measuring mature and established trees.

The Tree Protection Zone is the area around a tree that is the greater of either 5 feet, or 1 foot for each DBH. The Tree Protection Zone may be increased or decreased by the City Forester based upon the unique characteristics of the tree in question.

The City Engineer or City Forester may elect to specify the use of a protective fencing and/or barricades by the Contractor to mark the Tree Protection Zones or Zones of no disturbance for protected trees, street trees or designated trees. The fenced and/or barricaded enclosure shall achieve three-four primary goals, (1) to keep the foliage of tree crowns and branching structure clear from contact by equipment, materials and activities; (2) to preserve roots and soil conditions in an intact and non-compacted state and; (3) to identify the Tree Protection Zone in which no soil disturbance is permitted and activities are restricted, unless otherwise approved; and (4) to protect a tree trunk, roots and limbs from direct contact during work. The fences and/or barricades shall enclose the entire area designated by City Engineer or City Forester of the trees to be saved throughout the life of the project, or until final improvement work within the area is required, typically near the end of the project. The fences s and/or barricades shall be erected before the demolition, grading or construction begins. Do not remove Tree Protection Zone fencing/barricades to allow for deliveries or equipment access through the protection zone. Whenever construction fencing and/or barricades are-is used, a bid item shall be included in the contract, unless specified as incidental.

107.13(a) Underground Utility Excavation & Installation.

The Contractor shall not grade, excavate, full depth saw cut sidewalk or otherwise disturb the area within the Tree Protection Zone five (5) feet of any tree as measured from the outside edge of the tree trunk or visible aboveground portion of the root system along the length of the terrace, without prior consultation with and permission from the City Forestry Representative.

For laterals or utilities located in close proximity to terrace trees, the situation shall be reviewed on a case by case basis by the Engineer and City Forestry Representative. The contractor shall use construction methods to minimize tree damage as directed by the Engineer. The Engineer may elect to terminate lateral installation prior to conflict with tree (normally terminate at the curb). Most laterals shall have their locations verified and on the plan set in advance of bidding. Laterals that have not had their locations verified, shall be so noted on the plans.

Boring under or within the 5-foot Tree Protection Zone may be allowable, and is recommended compared to open trenching.

All roots over one (1) inch in diameter that are damaged shall be cleanly cut immediately in back of the damaged section on the same day of the excavation. Cuts may be made with lopping shears, chainsaw, stump grinder, sawzall or other means which will produce a clean cut. Exposed roots should be covered as soon as excavation and installation are complete.

The Contractor shall not rip or pull roots out towards the trunk of a tree while excavating with a backhoe. The use of a backhoe to clean cut roots is NOT acceptable.

107.13(b) Curb Excavation and Installation.

Root masses that grow very close to, up to or over curb will require extra care during excavation. Curb modifications may be necessary as determined by the Engineer or City Forester, such as curving into the direction of the street to avoid damage to the root system or hand formed curb.

All roots over one (1) inch in diameter that are damaged shall be cleanly cut immediately back of the damaged section on the same day of the excavation. Cuts may be made with lopping shears, chainsaw, stump grinder, sawzall or other means which will produce a clean cut. Exposed roots should be covered as soon as excavation and installation are complete.

The City Forester will review curb and gutter that is marked for removal and adjacent to street trees. Forestry will mark curb and gutter with "NRC" (No Root Cutting) next to trees that curb and gutter removal and replacement has a greater potential to damage tree roots. The Contractor shall proceed in the following sequence to repair sidewalk marked with NRC as follows:

1. Place a yellow ribbon around the tree marked NRC at approximately 4-feet from the ground in order to highlight these trees for the equipment operator removing the concrete;
2. Ribbon shall remain until forms have been removed;
3. Carefully remove the concrete curb and gutter so marked and those adjacent curb and gutter sections six (6) feet on either side of the visible root flair without excavating into the terrace or without damaging roots;

4. At the City's discretion, install a type II barricade;
5. Await inspection by Forester, who shall determine which roots can or cannot be cut or shaved, how much excavation can be safely allowed and communicate their findings to the Contractor and the Engineering Construction Inspector. After the Contractor notifies the City Forestry staff that the removals are complete and ready for their determination, the City Forestry staff shall respond by the end of the following work day. Rain days, weekends and holidays do not count as a work day for this purpose.
6. Proceed to cut or shave roots in the presence and under the direction of the Forester.

At locations where the curb and gutter is to be removed and replaced that are adjacent to street trees that are not marked "NRC", the Contractor can remove the concrete and underlying soil to sub-grade without notification to the City Forestry Representative.

Curb excavations shall be limited to one (1) foot behind the proposed curb for trees less than 10" in DBH (Diameter at Breast Height), for a distance of ten (10) feet each way from a tree trunk to reduce damage to the root system.

Curb excavations shall be limited to six (6) inches behind proposed curb for trees greater than 10" DBH, or street terrace widths less than six (6) feet for a distance of ten (10) feet each way from a tree trunk to reduce damage to the root system.

When excavation behind the curb is limited to less than 6 inches, the new curb must be a 'hand- formed' replacement for a minimum length as directed by the engineer.

Contractor shall not cut any roots that are 3" or larger in diameter without prior permission from the City Forestry Representative for curb and gutter installation.

In situations where root severing has to occur, the root cutting will be clean cuts – not jagged or ripped. The use of a Backhoe to clean cut tree roots is NOT acceptable.

All roots over one (1) inch in diameter that are damaged shall be cleanly cut immediately back of the damaged section on the same day of the excavation. Cuts may be made with lopping shears, chainsaw, stump grinder, sawzall or other means which will produce a clean cut. Exposed roots should be covered as soon as excavation and installation are complete.

107.13(c) Sidewalk Excavation and Installation.

The City Forester will review sidewalk that is marked for removal and adjacent to street trees. Forestry will mark sidewalk with “NRC” (No Root Cutting) next to trees that sidewalk removal and replacement has a greater potential to damage tree roots. The Contractor shall proceed in the following sequence to repair sidewalk marked with NRC as follows:

1. Place a yellow ribbon around the tree marked NRC at approximately 4-feet from the ground in order to highlight these trees for the equipment operator removing the concrete;
2. Ribbon shall remain until forms have been removed;
3. Carefully remove the concrete sidewalk so marked and those adjacent sidewalk sections six (6) feet on either side of the visible root flair without damaging roots;
4. At the City’s discretion, install a type II barricade;
5. Await inspection by Forester, who shall determine which roots can or cannot be cut or shaved and communicate their findings to the Contractor and the Engineering Construction Inspector. After the Contractor notifies the City Forestry staff that the removals are complete and ready for their determination, the City Forestry staff shall respond by then end of next work day. Rain days, weekends and holidays do not count as a work day for this purpose.
6. Proceed to cut or shave roots in the presence and under the direction of the Forester;
7. Install the granular sub-base, 3-inch minimum depth if the sub-grade is not acceptable, and new concrete sidewalk, 5-inch minimum depth;
8. Remove ribbon.

At locations where the sidewalk is to be removed and replaced that are adjacent to street trees that are not marked “NRC”, the Contractor can remove the concrete and underlying soil to sub-grade without notification to the City Forestry Representative. The Contractor and the City shall review the construction site for privately owned trees (on private property, but near the sidewalk to be removed) that could require the above process. In those cases, the trees shall be reviewed on a case-by-case basis with the property owner.

Contractor shall not cut any roots that are 3” or larger in diameter without prior permission from the City Forestry Representative for sidewalk installation or repair

within five (5) feet of any tree located in the terrace as measured from the outside edge of the tree trunk or visible aboveground portion of the root system. In situations where root severing has to occur, the root cutting will be clean cuts – not jagged or ripped. The use of a Backhoe to clean cut tree roots is NOT acceptable. All roots over one (1) inch in diameter that are damaged shall be cleanly cut immediately back of the damaged section on the same day of excavation. Exposed roots should be covered as soon as excavation and installation are complete.

107.13(d) Root Cutting / Root Grinding.

Roots shall be cut or ground as specified by the City Forestry Representative. This cutting or grinding shall require the use of tools such as: stump grinders; lopping shears; root saws; sawzall; front mounted stump or wheel grinders; and chainsaws. Unless otherwise specified the Contractor shall be paid per linear foot for Root Cutting for the length of the NRC Curb or NRC sidewalk, with a maximum length of fifteen (15) linear feet per NRC location, more specifically as follows:

Root Cutting – Curb & Gutter

Description

This item shall include all root cutting and / or root grinding as determined by the City Forestry Representative for roots under removed curb & gutter that has been marked with “NRC” for No Root Cut until further inspection. Work under this item shall include all work, materials, labor and incidentals necessary to cut or grind the root, using proper tools as prescribed by the City Forestry Representative.

Method of Measurement

Root Cutting – Curb & Gutter shall be measured per linear foot of curb & gutter that is marked with “NRC” in the field, with a maximum measurement of 15 linear feet per tree location.

Basis of Payment

Root Cutting – Curb & Gutter shall be measured as described above which shall be full compensation for all work, materials and incidentals to complete the work as described above regardless of the degree of difficulty per given location.

Root Cutting – Sidewalk

Description

This item shall include all root cutting and / or root grinding as determined by the City Forestry Representative for roots under removed sidewalk that has been marked with "NRC" for No Root Cut until further inspection. Work under this item shall include all work, materials, labor and incidentals necessary to cut or grind the root, using proper tools as prescribed by the City Forestry Representative.

Method of Measurement

Root Cutting – Sidewalk shall be measured per linear foot of sidewalk that is marked with "NRC" in the field, with a maximum measurement of 15 linear feet per tree location.

Basis of Payment

Root Cutting – Sidewalk shall be measured as described above which shall be full compensation for all work, materials and incidentals to complete the work as described above regardless of the degree of difficulty per given location.

107.13(e) Terrace Restoration.

All mechanical grading, including sod installation within five (5) feet of any tree as measured from the outside edge of the tree trunk or visible aboveground portion of the root system shall be prohibited unless directed by the City Engineer or City Forester.

107.13(f) Bark Abrasions and Limb Damage.

Contractor shall take precautions during construction not to disfigure, scar, or impair the health of any tree on public or private property.

Pre-construction pruning – Street trees will be pruned by City Forestry. All pruning shall be done according to ANSI A300 tree pruning specifications. No more than one-fourth (25 percent) of the functioning leaf and stem area may be removed within one calendar year. It must be recognized that trees are individual in form and structure, and that pruning needs may not always fit strict rules. Occasionally a limb may have to remain at a height less than fourteen (14) feet above the roadway. These instances shall be noted during the 'walk thru' and the Contractor shall employ methods to protect said limb. Pruning shall not be attempted by contractor unless approved by City Engineer or City Forester.

Contractor shall operate equipment in a manner as to not damage the branches of a tree. This may require using smaller equipment and loading or unloading materials in a designated space away from trees on the construction site.

Contractor shall notify City Forestry the same day of any damage to trees resulting from construction activities.

107.13(g) Soil Compaction.

The storage of parked vehicles, construction equipment, building materials, refuse, excavated spoils or dumping of poisonous materials on or around trees and roots within five (5) feet from the face of the tree measured in any direction or within the **Tree Protection Zone** is prohibited. Poisonous materials include, but are not limited to, paint, concrete or stucco mix, dirty water or any other material which may be deleterious to tree health. This not only prevents compaction, but also prevents damage to the trunks of trees and branches through scraping or scuffing the bark.

107.13(h) Contractor / Foreperson Acknowledgement.

The Tree Protection Specification and known conflicts and concerns shall be reviewed at the Pre- Construction meeting with the Contractor. This review shall include review of a one page educational informational sheet that details the procedures for avoiding damage to the tree and tree roots.

Utilities or others working in the Public Right of Way shall be required to sign this acknowledgement on a case by case basis.

107.13(i) Cost Recovery Charges and Liquidated Damages.

The Contractor's failure to follow the proper safeguards of these specifications shall result in the following cost recovery charges and liquidated damages to be assessed against the Contractor:

Where construction damage occurs causing or resulting in removal of the tree of 3 inch diameter or less (as measured **or estimated** at 4 1/2 feet above the ground **and rounded down to the nearest inch**):

1. The costs associated with removing the tree including wood disposal.
2. The costs associated with removing the stump to a depth of at least 24 inches below the ground, **and roots greater than 1 inch in diameter**.
3. The costs associated with replanting a replacement tree that is **either** balled & burlapped **or in a container** and shall have a minimum caliper of two (2) inches. The species and replanting location shall be determined by City Forestry.

Where construction damage occurs causing or resulting in removal of the tree of greater than 3 inch diameter (as measured **or estimated** at 4 1/2 feet above the ground **and rounded down to the nearest inch**):

1. The costs associated with removing the tree including wood disposal.
2. The costs associated with removing the stump to a depth of at least 24 inches below the ground, and roots greater than 1 inch in diameter.
3. The costs associated with replanting a replacement tree that is either balled & burlapped or in a container and shall have a minimum caliper of two (2) inches. The species and replanting location shall be determined by City Forestry.
4. The value of the existing tree which shall equal \$125.150.00 per trunk diameter inch, as measured or estimated at 4 1/2 feet above the ground and rounded down to the nearest inch.

For bark scraping, trunk wounding and broken branches:

1. The costs associated with pruning broken branches, including wood disposal.
2. Loss of limb or broken branch larger than three (3) inches in diameter: \$500.00 for each occurrence. Breakage of limbs that are less than fourteen (14) feet above the roadway shall be reviewed on a case by case basis.
3. Any damage to trunk or bark for trees measuring less than 8 inches as measured at 4 1/2 feet: \$500.00 for each area.
4. Damage (measuring 8 square inches) to trunk or bark for trees measuring 8 inches - 12 inches as measured at 4 1/2 feet: \$500.00 for each area.
5. Damage (measuring 16 square inches) to trees measuring greater than 12 inches as measured at 4 1/2 feet: \$500.00 each area.

For root cutting or excavation within the Tree Protection Zone:

1. For mechanical excavation within five (5) feet of a tree as measured from the outside edge of the tree trunk or visible aboveground portion of the root system or within the designated Tree Protection Zone, whichever is larger, including ripping of roots back towards the trunk, without prior permission from City Forestry Representative: \$500.00 for each occurrence
2. For mechanical excavation beyond six (6) inches or one (1) foot of the proposed curb installation, as determined by the size of existing tree and terrace width, including ripping of roots back towards the trunk: \$500.00 for each occurrence (see Curb excavation and installation specifications)
3. For failure to cleanly cut damaged roots greater than one (1) inch on the same day as the excavation: \$500.00 for each occurrence.

Soil Compaction. The storage of parked vehicles, construction equipment, building materials, refuse, excavated spoils or dumping of poisonous materials on or around trees and roots within five (5) feet from the face of the tree measured in any direction or within the designated ~~Tree~~ Protection Zone, whichever is larger:

1. Initial fine of \$500.00 will be applied.
2. For each additional day that materials, parking of vehicles or construction equipment remains within five feet of the tree or within the designated Tree Protection Zone, whichever is larger, a \$500.00 fine will be applied.

For Public Works Contracts these charges and liquidated damages shall be assessed as Liquidated Damages. For Private Contracts, Permit work, or others, these charges and liquidated damages shall be assessed as City imposed forfeitures or private contract forfeitures.

107.13(j) Private Development, Tree Removal.

If a private development shall require the removal of a public street tree to facilitate the construction of a site, adding a driveway, installing underground utilities, or any other improvement or site revision, the Developer shall obtain approval from City Forestry in advance of the proposed work.