# ITEM 102.523 TREE AND PLANT PROTECTION - VISIBILITY STAKES FOOT

*REV. 2025.07.15 (REV. DATE TO BE REMOVED BY MASSDOT CONTRACTS)*

The work under this item shall conform to the relevant provisions of Sections 644 and 771 of the Standard Specifications and the following:

Work under this item consists of furnishing, installing, removing, replacing, resetting visibility stakes, and final removal of stakes.

The purpose of the visibility stakes is to delineate a Tree and Plant Protection Zone (TPPZ), signifying a construction work-free zone, thereby preventing damage to tree roots, tree trunks, soil, and all other vegetation; as shown on the Drawings, or as required by the Engineer, and as described herein.

Protection shall be for the duration of the construction activities unless otherwise required by the Engineer.

## MATERIALS

Stakes shall be wood stakes or metal U-Channel stakes or similar as approved by the Engineer. Stakes shall be a minimum of 48 inches tall, measured from the ground, with a minimum of 12 inches embedment (total stake length of 60 inches), and painted orange for visibility. Stakes shall be set at the distance necessary to remain highly visible, but no farther than four (4) feet apart. The Engineer shall determine if closer spacing is required.

If required to establish a more effective protection zone, the Contractor shall supply and install signage to notify workers of the intended purpose of the visibility stakes and the TPPZ.

## ESTABLISHMENT OF THE TPPZ

Visibility stakes shall be used to delineate and establish the TPPZ, adjacent to construction areas, staging areas, stockpile areas, as shown on the Drawings, and/or as required by the Engineer.

The line of stakes shall be located as close to the work zone limit and as far from tree trunk(s) as possible to maximize the area to be protected. Stakes shall run parallel and adjacent to construction activity to create a visual barrier between the work zone and the root zone or designated limit of plants and soils to be protected.

When construction activities surround (or have the potential to surround) trees or plants to be protected, a circular enclosure shall be used. In these instances, the TPPZ limit shall be the Drip Line of each tree or as close as possible to the Drip Line, and as shown on the Drawings. The Drip Line is defined as the limit of tree canopy.

The Contractor shall not engage in any construction activity within the TPPZ without the approval of the Engineer, including: operating, moving or storing equipment; storing supplies or materials; locating temporary facilities including trailers or portable toilets. Accessing or traversing the TPPZ shall not be permitted.

## ****METHOD OF WORK****

Stakes shall be installed prior to any construction work or staging activities and be maintained in a vertical position. Stakes shall be repositioned or replaced where and as necessary for optimum effectiveness. Repositioning, replacement and adding additional stakes shall be incidental to this item. Delineation line shall not be moved without prior approval by the Engineer.

Stakes that are broken, no longer visible, or otherwise no longer function for the intended purpose shall be immediately replaced.

The TPPZ shall be protected from compaction of the soil; damage of any kind to trunks, bark, branches, leaves, and roots of all plants; and contamination of the soil with construction materials, debris, silt, fuels, oils, and any chemicals substance.

After construction activities are completed, or when required by the Engineer, stakes shall be removed and disposed off-site by the Contractor.

## ****REQUIRED WORK WITHIN THE TPPZ****

If grading, trenching, utility work, or storage is unavoidable within the TPPZ, the Engineer shall be notified. Measures may be required for tree protection and preservations, including air spading, the use of six-inch depth of wood chips or approved matting for root protection, pruning of branches, and/or trunk protection. These protection measures will be paid under applicable items.

Landscaping work specified within the TPPZ shall be accomplished by hand tools. Where handwork is not feasible, with permission of the Engineer, work shall be conducted with the smallest mechanized equipment necessary.

## TREE AND PLANT DAMAGES OR LOSS

If the TPPZ is encroached by construction activity without approval, at the discretion of the Engineer the Contractor may be required to provide a more durable barrier (e.g., Jersey Barriers) to secure the area. Costs of furnishing and installing additional or more durable barrier(s) shall be borne by the Contractor.

In such cases of encroachment, soils shall be considered compacted and tree root damage will be assumed. Action shall be taken as specified below.

In the event that trees designated for protection under this item are damaged, including root damage from unapproved trespassing onto the root zone, the Contractor shall, at his own expense, secure the services of an Arborist, described under Item 102.55. The Arborist shall be approved by MassDOT.

In the event of spills, compaction or damage, the Contractor shall take corrective action immediately using methods approved by the Engineer, in coordination with the Arborist.

If, based on the recommendations of the Arborist, the Engineer determines that damages can be remedied by corrective measures, such as repairing trunk or limb injury, soil compaction remediation, pruning, and/or watering; the damage shall be repaired as soon as possible, within the appropriate season for such work, and according to industry standards.

If the recommendation determines that damages are irreparable, or that the damages are such that the tree is sufficiently compromised to pose a future safety hazard, the tree shall be removed. Tree removal shall include cleanup of all wood, grinding of the stump to a depth sufficient to plant a replacement tree or plant, removal of all chips from the stump site, and filling the resulting hole with topsoil. Such tree removal(s), grinding, debris removal, and filling, shall be at the Contractor’s expense.

Tree removal from improper or inadequate protection of the TPPZ shall result in the Engineer assessing the Contractor monetary damages consistent with industry standards for assessed value and/or replacement.

Shrubs removals from improper or inadequate protection of the TPPZ shall be replaced with plants of similar species and equal size or the largest size plants reasonably available. The Engineer shall approve the size, quality, and quantity of the replacement plant(s). Each replacement shall include a minimum of one year of watering and establishment care, specified under Section 771.

## METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 102.523 Visibility Stakes will be measured and paid for payment by the linear FOOT, complete in place.

This will include all labor, materials, equipment, maintenance, resetting, final removal/disposal of the stakes, damage repaired, and all incidental cost required to complete the work.

Payment for work under this item will be scheduled as follows:

* Forty (40) percent of the value payment will be made upon installation of visibility stakes.

* Sixty (60) percent of the value payment will be made when stakes have been maintained to function as specified for the intended duration and removed and disposed off-site at the completion of protective measure requirement.

Signage and replacement stakes shall be incidental to the item. No separate payment will be made for costs of remedial actions, including addition of more durable barriers, or arborist services, but all costs in connection therewith shall be included in the Contract unit price bid.

In the event of irreparable damage due to lack of or improper protective measures being taken, no compensation shall be given, in addition to the assessed damages deducted from the contract price of the work..