# ITEM 102.523 TREE AND PLANT PROTECTION - VISIBILITY STAKES FOOT

*REV. 2022.01.01 (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, and resetting visibility stakes, and final removal of stakes.

The purpose of the visibility stakes is to delineate a Tree and Plant Protection Zone (TPPZ) to prevent damage to tree roots, tree trunks, soil, and all other vegetation as shown on the plans, as directed by the Engineer, and as described herein.

Protection shall be maintained as effective delineation and remain for the duration of the construction activities unless otherwise directed.

## 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 and painted orange for visibility. Stakes shall be set at the distance necessary to remain effective, but no farther than 4 feet apart.

If required to establishment a more effective protected zone, the Contractor shall supply and install signage to notify workers of the intent.

## ESTABLISHMENT OF TPPZ

Stakes shall be used to delineate and establish a Tree and Plant Protection Zone (TPPZ) for construction areas, staging areas, and stockpile areas as shown on the plans and as directed by the Engineer.

Line of stakes shall be located as close to the work zone limit and as far from the trunk as possible to maximize the area to be protected. Stakes shall run parallel and adjacent to construction activity to create a 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 plans and details. 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; and shall not permit employees to traverse the area to access adjacent areas of the project or use the area for lunch or any other work breaks.

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

Stakes shall be installed prior to any construction work or staging activities and be maintained in a vertical and effective 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 directed by the Engineer, stakes, and other materials 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 hand work 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 intruded upon, at the discretion of the Engineer, the Contractor will be required to provide a more durable barrier (e.g., fencing or Jersey barriers) to secure the area. Cost of furnishing and installing additional or more durable barrier shall be borne by the Contractor.

If the Contractor intrudes into a TPPZ without approval, soil will be considered compacted and tree root damage will be assumed. Action will be taken as specified below.

If 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 obtain an Arborist. 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 will be repaired as soon as possible within the appropriate season for such work and according to industry standards.

If the Engineer determines that damages are irreparable, the Contractor shall pay for the damages in the amount of $500.00 per diameter inch at breast height (DBH) per tree.

Additionally, if the Engineer determines that the damages are such that the tree is sufficiently compromised as to pose a future safety hazard, the tree shall be removed. Tree removal will include cleanup of all wood parts, 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.

Shrubs will be replaced with a plant of similar species and equal size or the largest size plants reasonably available. The Engineer will approve the size and quality of the replacement plant. Replacement will include a minimum of one year of watering and care.

## METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 102.523 will be measured and paid for payment by the foot complete in place. This includes all labor, materials, equipment, maintenance, final removal and disposal of the protective materials, damages repaired, and all incidental cost required to complete the work.

Payment of 40 percent of value will be made upon installation of stakes. The remaining 60 percent will be made when protection materials have been removed and disposed off-site and provided stakes were maintained to function as intended.

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 proper protective measures being take there will be no compensation in addition to the $500.00 per diameter inch penalty.