## SPL-XX, LIVE STAKES

Version Date: 5/14/2021 Revision Date: XX/XX/XXXX by XXX

### **DESCRIPTION**

The work covered in this special provision includes preparation, furnishing equipment, materials, and labor necessary to install and maintain live stakes on “finished” stream banks as shown on the plans and/or as directed by the City.

Live stakes shall be installed in accordance with the various stream bank stabilization techniques described in the Contract Documents.

All planting shall be executed during the dormant season for each species (generally November 15 thru March 15).

### **MATERIALS**

Live stake materials shall consist of materials specified in the Contract Documents, or if not specified, then shall be made up of the species and percentages in the table below.

Live stakes shall measure one-half inches to two inches (1/2” – 2”) diameter, two to three feet (2’ – 3’) in length, angled on the bottom and cut flush on the top, with buds oriented upwards. Live stakes shall be living based on the presence of young buds and green cambium. All side branches shall be cleanly trimmed, so the cutting is a single stem. They shall be cut at a 45° angle on the basal end and cut flat on the other end. The basal end is intended as the end to take root and shall be the end installed in the ground. Live stakes shall not be harvested after March 15 or before November 15.

| **BOTANICAL NAME** | **COMMON NAME** | **PERCENTAGE** |
| --- | --- | --- |
| *Cephalanthus occidentalis* | Buttonbush |  |
| *Cornus**amomum* | Silky dogwood |  |
| *Physocarpus opulifolius* | Nine bark |  |
| *Salix sericea* | Silky willow |  |
| *Sambucus canadensis* | Elderberry |  |
| *Rosa Palusrtris* | Swamp Rose |  |
| *Viburnum dentatum* | Arrowwood Viburnum |  |
| *Alnus serrulata* | Tag Alder |  |
| *Salix nigra* | Black Willow  |  |
|  |  |  |
|  |  |  |

Apply the Live Stakes as shown on the Planting Plan and Details or as directed by the Engineer.

### **SUBMITTALS**

Furnish a copy of tags used to identify cuttings after harvest and during transport or any tickets, tags, or manifests for purchased materials, as applicable based on the Contractor’s method of live stake procurement/ harvesting. Provide the following documentation:

1. The Contractor may decide to harvest live cuttings or purchase live cuttings and/or pre-made live stakes. If the Contractor decides to harvest their own material:
	1. A list of live cutting harvest sites shall be provided ten days prior to beginning the Work.
	2. A copy of the signed written agreement and applicable correspondence between the harvest site property owner and Contractor shall be provided ten days prior to beginning the Work. At minimum, the signed agreement shall:
		1. Grant permission to harvest.
		2. Specify the requirements of access/egress.
		3. Specify the use of and condition in which the harvesting site is to be left.
		4. Acknowledge that the Contractor shall be solely responsible for activities on the harvesting site and shall hold the Owner and any other parties harmless.
		5. Certify that the proposed cutting material is insect and disease free.
	3. Provide a copy of any applicable permits from regulatory agencies for the harvest site.
2. If the Contractor decides to purchase live cuttings and/or pre-made live stakes, provide the name and location of and contact information for the supplier. Suppliers must provide all of the written information required of the Contractor.

### **METHODS**

Live stakes shall be installed by a professional certified by the NC Landscape Contractors’ Registration Board or an individual with a B.S. in Biology or a closely related field with successful planting experience. Live stakes shall be installed into the ground using a dead blow hammer. They shall be installed so that approximately one-fifth of the stake protrudes with at least two buds exposed from the finished ground elevation. On the sloped areas, they shall be placed at right angles to the slope face. In cases where the ground is hard, a pilot hole may be made to assist in inserting the live stake. The Contractor may use a half-inch metal rod or other means acceptable to the Engineer for this purpose. The intent of this requirement is to maintain firm soil/stake contact after the live stake is installed. The rod must be removed carefully and may not be rotated to enlarge the hole.

Species selection may be adjusted depending on availability. Substitute species must be approved by the Engineer prior to installation. All final locations and configurations shall be determined in the field by the Engineer.

The stakes shall be installed per the spacing requirements shown on the plans. Live stake applications shall follow application rates shown in details.

No planting shall be done in soil that, in the opinion of the City, is too wet, too dry or not properly conditioned as provided in these specifications. No planting shall be done on channel banks that have not been seeded and stabilized with erosion control matting, unless otherwise directed by the City.

Materials shall be installed the same day as prepared or stored in a refrigerated area that has been kept moist for no longer than ten (10) calendar days.

Protect plants at all times from sun, drying winds, and frost. Plants that cannot be planted immediately on delivery shall be kept well protected from winds and frost. Bundles of harvested live material should be kept with cut ends submerged in water to keep cut ends moist at all times. Care shall be taken to keep bundles moist during transportation from the harvest site to the planting site. Live cuttings that appear to be dried out or damaged during transportation will not be accepted. Rejected live cuttings may be marked by the City.

### **WARRANTY**

All live stakes installed by the Contractor shall be assessed by the Engineer or representative thereof at the end of the same planting season they were installed. One hundred percent of the live stakes must be installed correctly and still be alive at the time this assessment is completed. If dead plant material is found, the Contractor is responsible for replacing that material before the completion of that planting season (March 15). At the completion of one full growing season following planting, all live stakes installed by the Contractor shall be assessed by the Engineer. Eighty percent (80%) of the live stakes must survive after one full growing season. If the Contractor does not meet this requirement then all dead plant material shall be removed and replanted during the next planting season. The new replacement live stakes shall have the distal end marked with yellow paint and will also be under warranty and be assessed at the conclusion of the next full growing season. Replacement of live stakes under warranty is required to have 80% survival of the original planting at the end of any new warranty period. The Engineer, or representative thereof, shall have the option to do a 100% count or to substitute a method of random systematic sampling that counts survival on 25% of the planted area and have these results of this sampling method represent the actual estimate of survival for warranty purposes.

The Contractor shall be responsible for furnishing equipment, materials, labor, incidentals and water to maintain plant survival in accordance with these specifications during the construction contract and during the warranty period.

The Contractor shall be responsible for traffic control through the life of the project and warranty period.

### **MEASUREMENT**

This item will be measured by each unit furnished, properly installed and accepted by the Engineer, including all labor, machinery, materials, maintenance, hauling, preparing, harvesting, and installing of the item to complete the work in an acceptable manner. No payment shall be made for improperly installed stakes, i.e. mushroomed or split ends. Live stakes used for construction of “Vegetated Geo-grid with Root Wads” are considered incidental and not measure for payment under this special provision.

### **PAYMENT**

Payment will be full compensation for all work covered in this special provision, including, but not limited to installation, harvesting, preparation, hauling, staking, repair, replacements, maintenance, and for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Payment will be made under:

**LIVE STAKES EA**