# PROJECT SPECIFICATIONS
# RIPARIAN BANK LIVE STAKES

## 1. GENERAL

### 1.1. Related Documents

The provisions of the contract apply to the work specified in this section.

### 1.2. Description of Work

This work shall consist of harvesting, transporting, installing, and maintaining live stake materials into the backfill along the river bank, as specified on the plans or as directed by the ENGINEER.

### 1.3. Warranty

The CONTRACTOR shall maintain a 1 year, 85 percent care and replacement warranty for all live stakes. The period of care and replacement shall begin after inspection and approval of the initial installation of all live stakes and continue for 1 year, with one potential replacement period. The CONTRACTOR will not be responsible for live stakes that have been damaged by vandalism, fire, flooding or other activities beyond the Contractor's control.

## 2. PRODUCTS

### 2.1 Live Stakes

#### 2.1.1 Condition

Live cuttings for live stakes shall be ½ to 1½ inches in diameter and 3 feet in length. Side branches shall be removed and the bark left intact prior to installation. Buds on the stakes shall be oriented in an upward position. The basal ends shall be tapered to a point for easy insertion into the soil. The top shall be cut smooth and square.

#### 2.1.2 Species

Live stakes shall consist of a mix of three or more of the following species, with each species comprising no more than 50 percent and no less than 20 percent of the mix.

| | |
|---|---|
| Cornus amomum | Silky dogwood |
| Salix interior | Sandbar willow |
| Sambucus canadensis | American elderberry |

## 3. EXECUTION

3.1 General

All materials and construction techniques shall be inspected and approved by the ENGINEER prior to installation.

3.2 Harvesting

The source of all live cuttings shall be from purchased stock or located on-site or within 25 miles of the project site. The CONTRACTOR shall locate, flag, and code the live cutting sites. The CONTRACTOR shall notify the ENGINEER 72 hours prior to harvesting to review and approve all harvesting sites. Upon approval by the ENGINEER, the CONTRACTOR shall be responsible for harvesting and transporting the cuttings to the job site.

3.3 Purchasing

If the CONTRACTOR is unable to locate sufficient harvesting sites for the live stakes, upon approval from the ENGINEER, the CONTRACTOR may purchase live branch material from a State certified nursery. The material shall meet all of the specifications found in this section.

3.4 Live Material Preparation

3.4.1 Cutting Shrubs and young trees used in preparation of live stakes shall be cut directly above the ground. All cuts shall be smooth and the cut surface kept small. The use of large pruning shears or power saws may be required. Trees that are more than 3 inches in diameter shall be topped. The live materials shall be transported to the construction site within 8 hours of harvesting and then cut to size, as specified above and on the details.

3.4.2 Storage Live materials must be protected against drying out and overheating before/during transport (e.g., they shall be covered, transported in unheated vehicles, moistened, kept in soak pits) and on-site prior to installation (e.g., by storing in controlled conditions, storing in shade, covering with evergreen branches or plastic, placing in moist soil, or spraying with anti-transparent chemicals). Live materials shall receive continuous shade, shall be sheltered from the wind, and shall be continuously protected from drying by being heeled into moist soils. Where water is available, live cuttings shall be sprayed or immersed. Warm water (over 150 degrees C) stimulates growth and should be used only upon the approval of the ENGINEER. Any costs associated with such storage are incidental to the overall unit costs. Live materials shall be installed the same day that the cuttings are harvested. If installation of live materials cannot be accomplished on the same day and storage is required, live materials shall be stored for a period no longer than two (2) days. Any storage of live materials must be approved by the ENGINEER prior to storing.

3.5 Live Stake Installation

3.5.1 Installation Drive live stakes through the erosion control fabric and into the ground so that 67 percent of the stake is below the ground surface. The CONTRACTOR shall use a dead-pan hammer for driving the stake directly into the ground or drive a pilot hole, smaller in diameter then the live stake, and then driving the live stake into the pilot hole. Stagger the live stakes in a random pattern throughout the specified planting area at a density of 3 live stakes per square yard. Live stakes shall be installed above low flow water surface and below bankfull elevation.

3.5.2 Placement Placement of the live stakes shall be indicated on the drawings and details. Live stake buds shall be facing upward.

3.5.3 Replacement of Split Stakes All live stakes split during installation may be left in place but must be supplemented with a new live stake that remains un-split after installation.

3.6 Maintenance

The CONTRACTOR shall maintain a 1 year, 85 percent care and replacement warranty for live stakes. The CONTRACTOR shall perform maintenance as follows: a) Replace all diseased and dead vegetation caused by factors other than stream erosion; b) Keep vegetation cleared of debris after all storm events; and c) Prune all dead wood and vegetation as needed. It will be the Contractor's responsibility to supply water if there is none available on the site. Any costs associated with supplying water shall be the responsibility of the CONTRACTOR and shall be included in the unit cost of the live staking installation.

4. MEASUREMENT AND PAYMENT

4.1. Live stakes will be measured on a per each basis based on actual quantities installed.

4.2. Payment as described above shall be considered full compensation for all labor, equipment and materials required to complete the work as required.