## SPSRW-XX: Vegetated Soil Lift

Version Date: 06/12/2023 Revision Date: XX/XX/XXXX by XXX

### Description

THIS WARRANTY SECTION IS BASED ON A PLANTING SEASON BEING DEFINED.

The work covered by this section consists of preparation, excavation and installation of all materials required for proper installation of Soil Lifts, as specified in the Contract Documents, or as directed by the Engineer. Vegetated Soil Lifts, which are also referred to as soil lifts, are bank revetment structures composed of compacted soil wrapped in erosion control matting (TYPE TO BE SPECIFIED BY ENGINEER), and live brush and/or live stakes.

The quantity of Soil Lift to be constructed will be affected by actual conditions that occur during the construction of the project. The type and quantity of Soil Lift may be increased or decreased at the direction of the Engineer. Such variations in quantity will not be considered as alterations in the details of construction or a change in the character of the work.

### Materials

ENGINEER TO UPDATE IF THEY FEEL THAT THIS SPECIFICATION IS INADEQUATE FOR SITE CONDITIONS.

Matting shall be per the Contract Documents and in accordance with specification Erosion Control Matting (coir matting).

All stakes should be untreated hardwood, with a size and length, as specified in the Contract Documents.

Live stakes shall meet the material requirements for “Live Stakes”. Soil placed in the lifts shall be free of debris, invasive species, and suitable for planting.

Soil Lift backfill material shall be a mix of onsite native material (70 percent) excavated from the channel bank, where available, imported topsoil (25 percent), and compost (five percent). Where onsite native material is not available, appropriate imported material shall be used. Soil mixing can be completed onsite where excavated material is generated. Topsoil shall be delivered to the stockpile areas adjacent to each work area where Soil Lifts will be installed. Material excavated from the channel slopes that is not immediately re-used may be stockpiled onsite for use in areas where soil lifts will be installed on eroded banks that may require additional fill to attain grade. Material excavated from the channel slopes that is not re-used in Soil Lift construction shall be removed from the project site and disposed of properly at no additional cost to the City.

Topsoil and Compost used in Soil Lifts must meet the requirements of the Topsoil and Planting Mix specifications herein or as required in the Contract Documents.

Live cuttings, live branches cut from fresh, green, healthy, dormant parent plants that are adapted to the site conditions shall meet the following guidelines:

Woody branches up to one inch in diameter and not less than five feet and not more than ten feet in length shall be used.

Live cuttings shall be kept covered and moist at all times. A mixture as listed below shall be used.

|  |  |  |
| --- | --- | --- |
| Scientific Name | Common Name | Percentage of Total (+/- 5%) |
| *Cornus amomum* | Silky Dogwood | 35%  |
| *Salix sericea* | Silky Willow | 35% |
| *Sambucus canadensis* | Elderberry | 15% |
| *Physocarpus opulifolius* | Nine Bark | 15% |

Products should be handled in a manner that prevents damage prior to and during installation. Fabric (erosion control matting) should be stored with suitable wrapping for protection against moisture and ultraviolet exposure prior to installation.

Live cuttings shall be installed the same day as prepared or stored in a refrigerated area and kept moist for no longer than two weeks. Bundles of harvested live material should be kept with cut ends submerged in water to keep cut ends moist at all times.

Filter fabric for shall meet the Type 2 material requirements of NCDOT Section 1056 Geosynthetics.

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 Engineer.

### Methods

ENGINEER TO UPDATE IF THEY FEEL THAT THIS SPECIFICATION IS INADEQUATE FOR SITE CONDITIONS.

Installation should follow the procedure below:

* 1. Install toe protection in accordance with the Contract Documents. Toe protection may include boulder toe, rock toe, and/or other specified technique, as approved by the Engineer.
	2. Grade/excavate the soil above the installed toe protection to provide a smooth and even surface prior to application of the matting. The surface shall be reviewed by the Engineer prior to proceeding with the work.
	3. The matting shall be placed in the graded area and extend over the toe protection to the face of the existing slope and/or back of the undisturbed soil.
	4. Secure the matting with dead stout stakes. Place clean Planting Mix in six-inch lifts, compacting each lift to 85-90 percent standard Proctor density (ASTM D698) to the desired lift height. Wrap the fabric over the surface of the soil lift and extend the fabric to the face of the existing slope. The first lift shall be graded to allow the first layer of live dormant woody cuttings to be placed perpendicular to the proposed stream bank slope.
	5. The matting shall be laid over the stream bank surface in tension and be placed neatly and with no gaps or wrinkles. Any matting overlaps necessary shall be as specified in the Contract Documents. The matting shall be staked at the face of the existing slope to a depth as specified in the Contract Documents.
	6. If specified (see below regarding planting season), install a layer of live dormant cuttings perpendicular to the proposed stream bank slope. Cuttings shall be placed to a specified thickness, in a crisscross or alternative configuration, with the growing tips generally oriented toward the proposed stream bank slope. The length of the live cuttings shall be sufficient to touch the back of the existing slope face or as specified by the Engineer. Site conditions may require a slight deviation in design length to maintain bank of scour contact. Trim the basal ends of the live cuttings as the length needed to properly install the live cuttings changes with each additional layer and the proposed design slope.
	7. Place the soil between the branches to provide a soil to cuttings interface. The matting shall be placed over a layer of installed live dormant cuttings.
	8. Repeat steps d) through g) alternating lifts and live cuttings until the Soil Lift reaches the last lift per the Contract Documents and/or based on site conditions.
	9. Upon reaching the top of the proposed design slope the matting shall be brought up and over the top of the stream bank and secured into a trench located as shown on the plans. The trench width and depth shall be per the Contract Documents.
	10. The matting shall be placed into the trench, secured with a dead stout stake, and backfilled with clean soil.
	11. Install field stakes of a size, type, in a pattern, and with spacing dimensions as specified by the Manufacturer or as otherwise specified in the Contract Documents.
	12. Erosion control matting shall be neatly secured around any project elements, undisturbed trees/shrubs, and existing structures to prevent any loose or frayed edges. There shall be no loose ends or unsecured erosion control fabric on the completed work.
	13. Repeat steps a) through l) until the Soil Lift installation area is in compliance with the Contract Documents.

Site conditions may require slight deviation from the planting plan and shall be approved by the Engineer.

The face of the completed Soil Lift shall match the design bank slope.

If constructed outside of the months November 15- March 15 (dormant season and planting season), the soil lifts shall be constructed without the live cuttings. Brush material and/or live stakes shall be installed at a later time after the dormant season has begun per the direction of the Engineer.

### Warranty

All Soil Lifts with live cuttings or 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 cuttings or 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 end of that planting season. At the end of one full growing season following planting, each Soil Lift installed by the Contractor will be assessed by the Engineer or representative thereof again. The Soil Lift must have at least 70 percent of the surface area covered with healthy, established (green) live cuttings. If a Soil Lift does not meet this requirement, as determined by the Engineer, the Contractor shall remove the existing materials necessary to install new live cuttings or live stakes at the Contractor’s expense. The new Soil Lift will also be under warranty and be assessed under the same conditions at the conclusion of the next full growing season.

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 construction contract and warranty period.

### Measurement

The quantity of Soil Lift measured shall be the actual number of square yards measured horizontally along the surface of the ground over which the Soil Lift is properly installed and accepted by the Engineer. Material not properly installed shall not be paid.

There shall be no separate measurement for stakes, grading, coir matting, live cuttings, and the placement and compaction of soil or amendments to the soil.

There shall be no separate measurement for Planting Mix, Topsoil and Compost required for the Soil Lift.

### Payment

The quantity of toe protection will be measured and paid for separately under “Rock Toe or Boulder Toe” Specifications.

The quantity of Live Stakes will be measured and paid for separately under “Live Stakes”.

The Soil Lift measured as provided above will be paid for at the contract unit price per square yard of Soil Lift installed and accepted by the City. Such payment will be full compensation for all work covered in this special provision, including, but not limited to grading, compaction, stockpiling, mixing, installation, harvesting, preparation, hauling, staking, repair, replacements, maintenance, and for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work as specified in the Contract Documents or as directed by the Engineer.

Payment will be made under:

VEGETATED SOIL LIFT SY