## SPSRW-XX: Rock Drop Structure

Version Date: 08/03/2023 Revision Date: XX/XX/XXXX by XXX

### Description

The work covered by this section consists of furnishing, stockpiling, placing, and maintaining approved stone and boulders, and filter fabric to be utilized to construct the rock drop structure, as specified in the Contract Document or as directed by the Engineer.

The quantity of structures to be constructed will be affected by actual conditions that occur during the construction of the project. The type and quantity of this structure 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.

Backfill Material shall consist of a well-mixed gradation of, stone aggregate, rip rap, and earth. Earth material shall be sourced on site from stockpiled materials resulting from bank and/or channel bed excavations from channel construction activities. Earth material from channel bed excavation is preferable for well-mixed gradation placed in the channel and bank(s).

The type, size and gradation of the Backfill Material shall be specified by the Engineer to be mobile or non-mobile as the conditions in the channel warrant, and in accordance with the construction documents.

Stone aggregate and rip rap backfill material shall meet the material requirements of NCDOT section 1005 General Requirements for Aggregate and NCDOT section 1042 Rip Rap Materials.

Stone Backfill Material shall consist of durable field or quarry stone that is sound, hard, dense, slightly rounded, resistant to the action of air and water, and free of seams, cracks, or other structural defects. **The Contractor cannot use limestone or concrete waste for stone.**

Boulders shall consist of flat-sided, durable field or quarry stone that is sound, hard, dense, angular, and resistant to the action of air and water, and free of seams, cracks, or other structural defects. The Contractor shall use stone pieces with a “shape factor” greater than two (length and width more than twice the thickness). The Contractor cannot use limestone or concrete waste for stone. Stone shall be approved by the Engineer.

The size (length, width and depth (thickness)) of the boulder material shall as specified by the Engineer. Stone shall be approved by the Engineer.

Boulders for in-stream structures shall conform to the specifications for boulders shall conform to their respective specifications as shown on the plans.

Filter fabric for sealing structures shall meet the material requirements of NCDOT Section 1056 Geosynthetics.

### Methods

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

Structure installation and channel grading sequences may vary based on structure function and design. Grade control structures such as step-pool structures shall be installed as grading operations progress downstream.

* 1. Establish elevation control points of the proposed structure steps. The Contractor may install additional survey control, as needed, to complete the work in accordance with the Contract Documents. The step-pool structure stakeout shall be reviewed by the Engineer prior to proceeding with the work.
	2. Begin construction of the step-pool structure from the proposed downstream end of the structure and progress upstream with the increase in elevation until the structure is completed and tied into the specified upstream elevation.
	3. Place backfill at the elevation and/or depth specified on the plans. The backfill placement shall be reviewed by the Engineer prior to proceeding with the work.
	4. Place the control point “structure step” and construct the ring of boulders within the channel width as shown on the plans. Place boulders such that adjacent boulders have surface contact with minimal gaps.
	5. Bucket, rake and/or otherwise adjust placed backfill material, as needed, to create pools within the ring of boulders. backfill material shall be placed and graded in a manner that fills any gaps between the boulders and creates bed variability including, small pools, turbulent areas, and “high spots”.
	6. Repeat steps 4) through 6) for each drop until the Rock Drop Structure is completed as specified by the Engineer.
	7. Finish grade the adjacent streambed, channel banks, and/or floodplain to provide a smooth even grade transition between project structure components (arms, sills, inverts, etc.) and the existing and/or proposed ground surface.

In locations where exposed bedrock and/or other existing feature extends to and/or within the limits of the proposed work, the rock drop structure installation shall be field adjusted to incorporate the bedrock/existing feature, into the finished work. The Engineer shall be contacted as soon as the presence of bedrock and/or other existing feature is field identified, to determine the appropriate method of incorporation. Site conditions may require slight deviation from the plan and shall be approved by the Engineer.

### Measurement

The quantity of rock drop structure to be paid for shall be the actual number of square feet of “Rock Drop Structure” completed and accepted into the final work, as measured along the surface of the structure (control points, pools, and backfill bottom width).

No separate measurement of materials shall be made under this item for backfill, boulders, backfill material, logs/woody debris and/or other incidental items.

All coir matting will be measured separately.

### Payment

The work covered by this section shall be paid for at the contract per square foot price for “Rock Drop Structure”. Payment will be full compensation for all work covered in this special provision, including, but not limited to grading, installation, excavating, adjusting, placing backfill, maintaining the feature through acceptance, 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 shall be made under:

ROCK DROP STRUCTURE SF