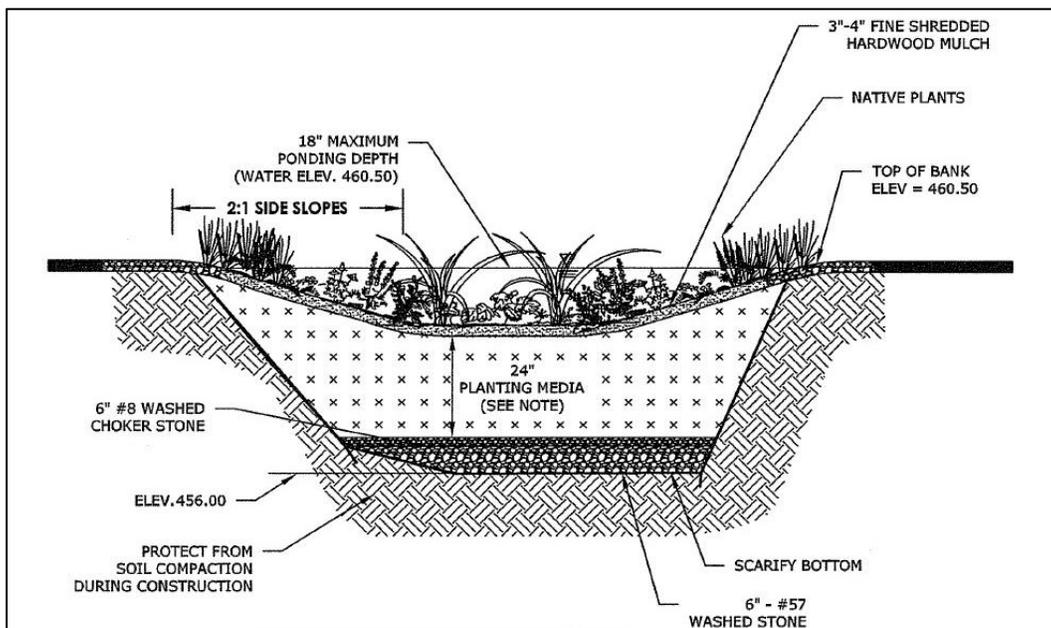


GREEN INFRASTRUCTURE INSPECTION GUIDANCE

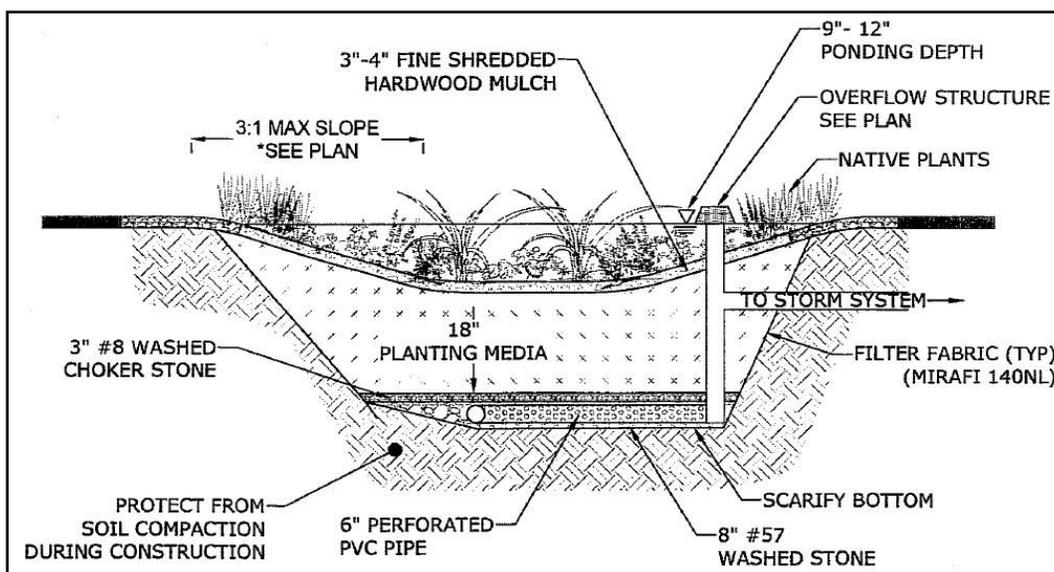
Green infrastructure practices need to be inspected during installation to make certain that the design and all materials used are to the approved plan's specifications. This will ensure the integrity and functionality of the green infrastructure practice.

The most common green infrastructure practices that have been used on construction plans in Columbia County are bioretention cells and enhanced dry swales. Below are examples of a bioretention cell detail, one with an underdrain and one without an underdrain, from an engineered plan. These details will help discuss the installation as well as the inspections associated with each components of these practices.

If you have any questions about the detail or associated notes on the approved plan or the installation process, please contact your engineer.



Picture 1: Bioretention Cell detail without an underdrain.



Picture 2: Bioretention cell detail with an underdrain.

Columbia County Stormwater Compliance Department

Mail: P.O. Box 498, Evans, GA 30809 ♦ Street: 630 Ronald Reagan Drive, Bldg. A, East Wing, Evans, GA 30809
 Questions? Call: (706)447-7645[SOIL] / Email: LDP@columbiacountyga.gov

****INSPECTOR MUST BE PRESENT - CALL INSPECTOR 24 HOURS PRIOR TO INSTALLATION******1. Dimensions of Practice**

The dimensions are a critical part of the design and installation process. Each practice is designed to handle a certain amount of runoff from the impervious surfaces constructed on a newly developed site. These dimensions can generally be found on the detail or the general grading plan sheet in the approved plan. If the practice is used as a temporary sediment trap (SD4) during construction, the practice must be excavated to the correct bottom elevation per the approved plan.

Soil has structure which allows for water and air exchange. When soil structure is damaged by construction activities, water cannot infiltrate the compacted soil. In order to rectify this issue, the area in which the practice will be installed needs to be protected to prevent compaction. Also, before the next phase of installation, the bottom of the practice needs to be scarified to promote infiltration.

If called out on the plan, the filter fabric needs to be installed per plan. This will prevent the migration of soil particles from the surrounding soils into the practice.

The inspector will be looking at the following to be installed per plan:

- Dimensions (Depth & Area)
- Top Bank Elevation
- Scarification of the bottom of the practice
- Filter fabric installation, if applicable

2. **Underdrain Installation

Depending on the soil testing results done during the design phase of the plan, an underdrain may or may not be necessary. An underdrain is incorporated into a design if the native soils, or substrate underneath a practice, does not have the percolation rate necessary for proper drainage. An underdrain with an upturned elbow (See Picture 2) can also allow for more contact time within the practice resulting in more pollution remediation, more time for infiltration and less runoff into the Stormwater system.

The inspector will be looking at the following to be installed per plan:

- Pipe type, radius, length, & position within the practice
- Connection to Stormwater system
- Overflow structure

3. **Verification of Approved Back-Fill Materials

The individual components of these practices work together to treatment and infiltrate stormwater runoff onsite. The rock and sand used in this practice must be washed thoroughly to remove any contaminants, like fines, from going inside the practice. These fine particles can clog up the practice and inhibit the flow of water. The planting media mix is specific to the site and will help achieve the infiltration rate. If you need assistance with locating the proper materials for your practice, please contact your engineer.

The inspector will be verifying the following materials are per plan:

- Type & size of stone layer(s)
- Verification that stone is washed

Columbia County Stormwater Compliance Department

- Planting media label verification (Proper mix of sand, compost, & soil)

4. ****Rock &/or Engineered Soil Installation**

The planting media and stone(s) layers form a filter that helps to remove pollutants and improve drainage to allow for infiltration. The rock installed at the bottom of the practice help increase permeability and help separate the planting media from the native soils as well as help protect an underdrain if present. The planting media and mulch layers can work together to trap or bind pollutants like heavy metals. It also helps to support the growth of the plants and the beneficial microbial communities within the practice. If you need assistance with installing the materials properly, please contact your engineer.

The inspector will be looking at the following to be installed per plan:

- Depth of Layers
- Order of Layers
- Ponding Depth
- Side Slope Ratio

5. **Vegetation Verification & Planting**

Plants play a vital role in mitigating pollution within the practice while adding to the aesthetics of the project site. The chosen plants are adapted to survive and thrive in both wet and dry conditions. These plants will remove nutrients from the soil and help break them down. These nutrients help the plant grow and thrive while removing the excess nutrients from the stormwater runoff. The number and placement of plants should be designated on the plan per your engineer or landscape architect.

The inspector will be looking at the following to be installed per plan:

- Types of plants (please leave plant ID tag on)
- Amount of plants
- Placement of plants

6. ****Infiltration Observation or Test**

These practices allow for water to infiltrate and is not designed to hold water. A bioretention practice, for example, should not have standing water in it 24 hours after a 1 inch or greater rain event. If standing water is still present, this could be due to: (1) clogged underdrain if applicable, (2) clogged media layer, or (3) incorrect bioretention media installed (clay content too high). This is also why it is important to work with our department to ensure inspections 1-5 are completed. Failure to pass this inspection can mean costly repairs as well as loss of time and money.

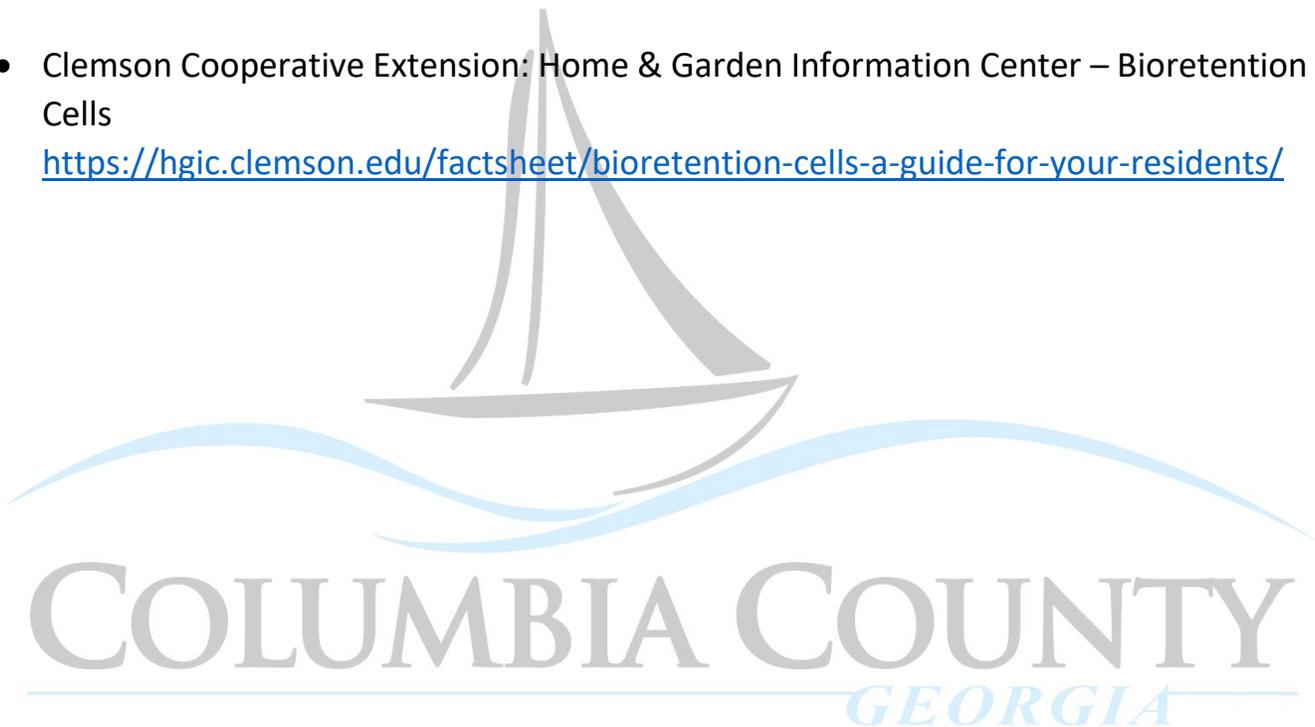
The inspector will be looking at the following at the end of a rain event and 24 hours after rain event:

- End of qualifying rain event:
 - Runoff reaching bioretention cell
 - Ponding zone reaching capacity
 - Overflow/bypass structures are functional
- 24 hours later
 - Ponding surface drawn down
 - Little to no standing water

Columbia County Stormwater Compliance Department

Resources

- United States Environmental Protection Agency (EPA) <https://www.epa.gov/green-infrastructure/green-infrastructure-design-and-implementation>
- Georgia Stormwater Management Manual
<https://cdn.atlantaregional.org/wp-content/uploads/gsmm-2016-final.pdf>
 - Appendix D: Planting & Soil Guidance (Pg.: 627 – 653)
 - Appendix E: Best Management Practice Operations & Maintenance (Pg.: 654)
- Clemson Cooperative Extension: Home & Garden Information Center – Bioretention Cells
<https://hgic.clemson.edu/factsheet/bioretention-cells-a-guide-for-your-residents/>



Columbia County Stormwater Compliance Department

Mail: P.O. Box 498, Evans, GA 30809 ♦ Street: 630 Ronald Reagan Drive, Bldg. A, East Wing, Evans, GA 30809
Questions? Call: (706)447-7645[SOIL] / Email: LDP@columbiacountyga.gov