

Bioretention Facility Construction Checklist

This checklist has been developed for BMPs designed in accordance with the Delaware Sediment and Stormwater Program's Post Construction Stormwater BMP Standards and Specifications. Submit interim versions of this construction checklist to the approval agency weekly with the Certified Construction Reviewer report. Submit the final completed checklist with the PCVD.

PROJECT INFORMATION

Project Name/BMP Name: _____

Project Approval Number: _____ NOI number: _____

Location: _____

Contractor: _____

Construction Reviewer: _____

Supervising P.E.: _____

Bioretention Variant

- | | |
|--|--|
| <input type="checkbox"/> 2-A Traditional Bioretention | <input type="checkbox"/> 2-D Engineered Tree Boxes |
| <input type="checkbox"/> 2-B In-Situ Bioretention including Rain Gardens | <input type="checkbox"/> 2-E Stormwater Planter |
| <input type="checkbox"/> 2-C Streetscape Bioretention | <input type="checkbox"/> 2-F Advanced Bioretention |

For each checklist item, enter in the blank the date (MM/DD/YY) the item is completed and verified by the construction reviewer. If an item is not applicable, enter "N/A" in the blank for that checklist item.

I. Pre-Construction

A. _____ Bioretention field meeting with responsible person and person completing construction checklist.

B. _____ Extents of bioretention (to include pretreatment area) delineated and access by equipment prohibited with Sensitive Area Protection (SAP) to prevent compaction of existing soils.

C. _____ Equipment on the site large enough to excavate bioretention from the sides of the facility.

D. _____ Pervious areas draining to the bioretention stabilized in accordance with the approved plans.

E. _____ Pipe and appurtenances on-site and dimensions and properties checked and confirmed to be in accordance with the approved plan.

i. _____ Discharge pipe

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- ii. _____ Overflow catch basin
- iii. _____ Inspection port(s)/Cleanout(s)
- iv. _____ Underdrain pipe
- v. _____ Other; list: _____

F. _____ Materials on-site and dimensions and properties checked and confirmed to be in accordance with the approved plan. **Submit materials invoice or delivery tickets to approval agency as part of PCVD for the following items:**

- i. _____ Clean, washed gravel (nominal 0.25” max 2.0% passing #200 sieve)
- ii. _____ Biosoil (60% concrete sand, 30% triple-shredded hardwood mulch, 10% aged STA certified compost) from Department approved vendor. If not used upon delivery, store it on an adjacent impervious area or plastic sheeting.
- iii. _____ Mulch (Triple shredded hardwood aged for a min of 6 months) *if applicable*
- iv. _____ Impermeable liner (Thirty mil (minimum) PVC Geomembrane liner covered by 8 to 12 oz./sq. yd. non-woven) *for Variant 2C*
- v. _____ Geotextile fabric (Flow rate > 110 gal/min/sf) *for Variant 2C*
- vi. _____ Other; list: _____

II. Excavation and Grading

- A. _____ Bioretention excavated to dimensions and at location as per the approved plan.
- B. _____ Bioretention excavated to design bottom elevation.
- C. _____ Bioretention excavated from the sides to not compact the existing soil.
- D. _____ Groundwater not encountered during excavation. (Note: If groundwater is encountered during the excavation process, construction of the facility must cease, and the designer notified that a plan modification is necessary)
- E. _____ Sides of bioretention below biosoil surface excavated vertically.
- F. _____ Side slopes above biosoil surface in accordance with the approved plan.
- G. _____ Bottom of excavation in accordance with the approved plan.
- H. _____ Bottom of bioretention excavation scarified prior to placement of stone/biosoil
- I. _____ Impermeable liner placed as specified on the approved plan. *For variant 2C*
- J. _____ Top of berm, curbing or tree box constructed to design elevation and width.

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K. _____ For bioretention with no underdrain, confirmatory testing performed in native soil at design bottom elevation in accordance with Soil Investigation Procedures for Stormwater BMPs. **Submit confirmatory infiltration testing report to approval agency as part of PCVD.**

- Confirmatory infiltration testing
 - Confirmatory rate is at least 150% of the approved design rate
 - Confirmatory rate is less than 150% of approved design rate; designer notified to provide plan revision
- Hand augers to a minimum depth of 3 feet below the bottom of the facility
 - Limiting layer not present
 - Limiting layer present; designer notified to provide plan revision

III. Structural Components

- A. _____ Pretreatment and energy dissipation provided at bioretention inlets as specified on the approved plan.
- B. _____ Discharge pipe installed from overflow catch basin to discharge point.
- C. _____ Rock outlet protection provided at all points of discharge and riprap stone size and dimension confirmed.
- D. _____ Overflow catch basin installed at elevations as specified on the approved plan.
- E. _____ Inspection port(s) installed.
- F. _____ Underground storage stone (clean gravel) placed with the depth of stone in accordance with the approved plan.
- G. _____ Photo documentation of construction of structural components taken. **Submit photo documentation to approval agency as part of PCVD.** (Photo #: _____)
- H. _____ Underdrain piping laid flat or with positive slope toward outlet.
- I. _____ Placement of minimum 3” of stone over underdrain piping.
- J. _____ 2’ stone sump.

IV. Bioretention Soil Media (Biosoil)

- A. _____ Biosoil (24” min depth) placed in max 1 ft lifts and spread using excavator from the side of excavation to minimize compaction. Wet biosoil between lifts.
- B. _____ Biosoil placed when moist (not wet or dry) and there is no precipitation.
- C. _____ After at least one storm event, check final biosoil elevation and add biosoil if needed.

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- D. _____ Placement of surface cover as required by the approved plan.
- E. _____ Photo documentation of placement of stone and biosoil components taken. **Submit photo documentation to approval agency as part of PCVD.** (Photo #: _____)

V. Vegetative Stabilization

- A. _____ Vegetated side slope areas have completed the following items. **Submit soil test report, lime, fertilizer, and seed tickets to approval agency as part of PCVD.**
 - i. _____ Soil testing.
 - ii. _____ Side slopes scarified to a minimum depth of 3 inches prior to placing topsoil
 - iii. _____ Application of topsoil to a minimum depth of 4 inches.
 - iv. _____ Application of soil amendments including lime and fertilizer in accordance with the recommendations of the soil test or the approved plan.
 - v. _____ Application of seed to the soil surface using approved methods.
 - vi. _____ Mulch applied in accordance with the approved plan.
- B. _____ Application of soil stabilization matting used on side slopes in accordance with approved plan.
- C. _____ Turf cover established on side slopes if called for on the approved plan.
- D. _____ Areas to be vegetated inside of the bioretention surface have been completed in accordance with the approved plans. **Submit planting tags to approval agency as part of PCVD.**
- E. _____ Photo documentation of landscaping components taken. **Submit photo documentation to approval agency as part of PCVD.** (Photo #: _____)

VI. Erosion and Sediment Control

- A. _____ Sediment prevented from entering bioretention by keeping it off-line or using perimeter controls as specified on the approved plan.
- B. _____ Drainage area and side slopes stabilized in accordance with the approved plan.
- C. _____ If drainage area includes newly installed asphalt, maintain inlet and curb cut blockage into bioretention until three storm events have passed.
- D. _____ Sediment controls removed once drainage area meets final stabilization standard

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VII. Maintenance Access

- A. _____ Maintenance access to the perimeter of the bioretention (including outlet structure) has minimum width of 15 feet.
- B. _____ Profile grade of maintenance access does not exceed 10H:1V.
- C. _____ Minimum 10H:1V cross slope on maintenance access.

VIII. Post Construction Verification

Owner shall submit post construction verification documents to demonstrate that the bioretention practice has been constructed within allowable tolerances in accordance with the Approved Sediment and Stormwater Management Plan and accepted by the approving agency.

- A. _____ Constructed top bank elevation at or above design elevation confirmed after ESC controls are removed.
- B. _____ Constructed bioretention surface area confirmed equal to or greater than 90% of the design surface area once ESC controls are removed.
- C. _____ Constructed volume of the bioretention storage confirmed equal to or greater than 90% of the of the design after IV.C above.
- D. _____ Constructed elevation of all structures confirmed to be within 0.15 foot of the design elevation for:
 - i. _____ Discharge pipe
 - ii. _____ Overflow catch basin
 - iii. _____ Inspection port(s)/cleanout(s)
 - iv. _____ Underdrain pipe
 - v. _____ Other; list: _____

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IX. BMP Acceptance

- A. _____ Final BMP construction review complete.
- B. _____ All BMP punch list items addressed.
- C. _____ Bioretention is online (stabilized drainage area is entering bioretention)
- D. _____ As-built survey.
- E. _____ PCVD submitted to approval agency for review and approval. Submit the following pieces of PCVD documentation to the approval agency:
 - Materials invoice or delivery tickets
 - Confirmatory infiltration testing report
 - Photo documentation
 - Soil test report
 - Lime, fertilizer, and seed tickets
 - As-built survey
 - Final, completed BMP Construction Checklist