

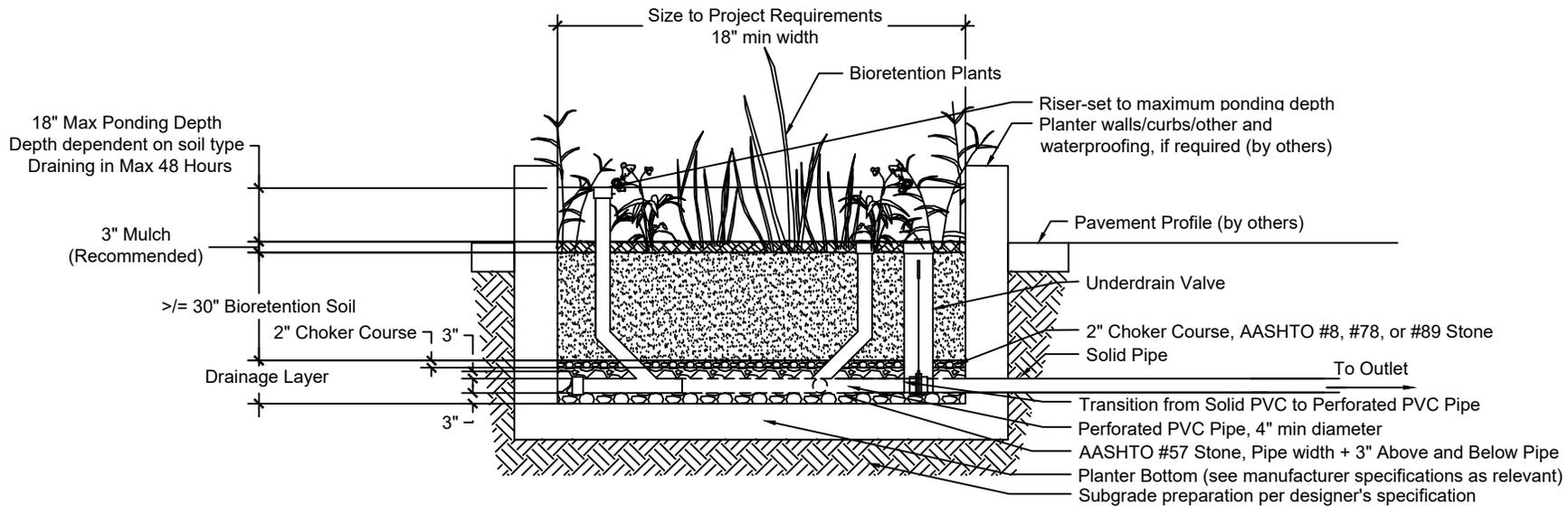
Edit all notes as needed to meet project requirements

NOTES TO DESIGNER

1. Provide adequate pretreatment for all filtration practices. See guidance in the Minnesota (MN) Stormwater Manual for pretreatment options and sizing.
2. For projects subject to regulation under Permit MNR100001, the Construction Stormwater General Permit, ensure that the design meets all requirements stated in Section 17, Filtration Systems, of the permit.
3. For practices that include an underdrain, see recommendations in the MN Stormwater Manual for underdrains.
4. *It is recommended that the following items be included in construction plans for biofiltration planters:*
  - 4.1. Identify emergency overflow pathways for planters on stormwater management plans. Ensure that overflows are directed to an appropriate drainage structure.
  - 4.2. Delineate all biofiltration areas on site, grading, utility, stormwater management, erosion and sediment control, or other relevant plan sheets to minimize mismanagement during construction.
  - 4.3. Develop a post-construction maintenance plan summarizing the type and frequency of maintenance activities recommended for stormwater facilities based on the type of practice and applicable site conditions.

CONSTRUCTION SEQUENCING

1. Construction of the BMP shall not begin until after all upstream drainage areas have been fully stabilized.
2. Review as-built elevations of installed utilities to confirm that required connections, clearances, and overflows for the biofiltration practices will be met. Adjust final grade of the practice as necessary.
3. Install appropriate temporary erosion control devices per MnDOT specifications 2573 and 3885 to prevent sediment from leaving or entering the practice during construction.
4. Perform continuous inspections of erosion control practices, especially after each rainfall event.
5. Construct following stabilization of contributing drainage area. Ensure that critical elevations, such as underdrain invert, top of media, and invert of overflow structure (if present) are correct. See site grading notes for more grading guidance.
6. Install vegetation per approved/recommended planting plan (see planting notes).
7. Remove temporary erosion control devices after the contributing drainage area is adequately vegetated.



Biofiltration Planter - Section

Not To Scale

<p style="font-size: small;">I hereby certify that this plan was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota</p> <p style="font-size: x-small;">Print Name: _____ Sign Name: _____ License No. _____ Date: _____</p>							
Date	Designed By	Drawn By					
<p style="font-size: x-small;">Minnesota Pollution Control Agency 520 Lafayette Rd St. Paul, MN 55155</p>							
<p style="font-size: small;">MINNESOTA STORMWATER MANUAL</p>							
<p style="font-size: small;">BIOFILTRATION PLANTER SECTION</p>							
<p style="font-size: x-small;">Sheet No. _____ of _____ Sheets</p>							

NOT FOR CONSTRUCTION PURPOSES

**SITE GRADING**

1. Protect biofiltration areas during site grading activity.
  - 1.1. Subgrade and decompaction measures shall be performed in accordance with MnDOT specification 2574 throughout the duration of construction.
  - 1.2. Do not excavate below the proposed media surface of biofiltration facilities prior to starting BMP construction to prevent clogging of parent soils at the proposed subgrade.
  - 1.3. Maintain perimeter controls around biofiltration area following rough grading to keep heavy equipment out of biofiltration areas.
2. If biofiltration areas are being used as temporary sediment basins during construction, leave a minimum of 1 feet of cover over the practice to protect the underlying soils from clogging.
3. See MN Stormwater Manual and planter box manufacturer's specifications for additional subgrade preparation recommendations.

**BMP CONSTRUCTION NOTES**

1. Ensure the planter bottom is impervious if placed within 10' of a structure.
2. Stormwater runoff is either piped, channeled, or directed by overland flow to the surface of the planter box.
3. The inflow must be designed to prevent erosion in the planter box. Erosion control alternatives include splash guards made of gravel or concrete, perforated pipes, and erosion control mats.
4. In the event that sediment is introduced into the bmp during or immediately following excavation, this material shall be removed from the practice prior to continuing construction.

**PLANTING**

1. It is recommended that a knowledgeable professional prepare a landscaping plan that includes both plant materials and maintenance schedules.
2. Planting should coincide with the plant's natural growth cycle to promote successful establishment.
3. Seeding is generally discouraged due to long establishment period and likelihood of being washed away with runoff.
4. It is recommended to keep the planter box offline until plants have sufficient time to grow and adequately establish.
5. Vegetation should be selected based on a specified zone of hydric tolerance, and plant species that tolerate ponding conditions should be prioritized.
6. Salt resistant vegetation should be used in locations with probable adjacent salt application.
7. Trees should not be planted directly overtop of underdrains.
8. The growth media should be 12"-36" deep and 4" deeper than the bottom of the largest root ball.
9. The following planting quantities are recommended per 100 square feet of planter box area:
  - 9.1. Four large shrubs/small trees in three-gallon containers or equivalent
  - 9.2. Six shrubs/large grass-like plants in one-gallon containers or equivalent
  - 9.3. Ground cover plants (perennials/annuals) one per 12" on center, triangular spacing. Minimum container: 4" pot. Spacing may vary according to plant type.
10. See Prairie/Native Plantings list for recommended plant species.

**UNDERDRAIN**

1. Install 2 or more underdrains for each planter box in case one clogs. At a minimum, provide one underdrain for every 1,000 square feet of filtration area.
2. It is recommended that underdrains be installed with a valve to constrain the flow of water out of the practice/reduce the need to supplement water if the planter is not holding sufficient water to support plantings.
3. Underdrain pipes should be installed with a minimum slope of 0.5%.
4. Each underdrain should have an underdrain valve, which enables the user to make adjustments to the discharge flow and control the infiltration rate.

**PLANTER BOX SPECIFICATIONS**

1. Planter box may be made of stone, concrete, brick, or pressure treated wood. Follow manufacturer's instructions and specifications for planter box installation, including required footings or subgrade preparation.
2. Depending on soil conditions, planter box materials, and planter box sizing, a geotechnical evaluation may be required.
3. Waterproofing of planter box sides may be necessary depending on project requirements.
4. See MN Stormwater Manual for recommended specifications for biofiltration soil, mulch, underdrains, etc.

**MAINTENANCE**

1. Following final inspection of biofiltration planter, BMP owner shall be responsible for all maintenance.
2. Recommended post-construction maintenance for this practice includes:
  - 2.1. Maintain the healthy vegetation.
  - 2.2. Clear debris from inlets and outlets to prevent clogging.
  - 2.3. Inspect underdrains periodically and remove accumulated sediment to maintain flow.

I hereby certify that this plan was prepared by me or under my direct supervision and I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.		NO.		REVISION DESCRIPTION		DATE BY	
Print Name: _____		Date: _____		Sign Name: _____		License No. _____	
Date	Designed By	Drawn By		 Minnesota Pollution Control Agency 520 Lafayette Rd St. Paul, MN 55155			
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<b>MINNESOTA STORMWATER MANUAL</b>				<b>BIOFILTRATION PLANTER NOTES</b>			
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