

NJ's Stormwater Management Regulations

ANJEC Commissioner Training

March 9, 2022
Virtual Class



RUTGERS
New Jersey Agricultural
Experiment Station



N.J.A.C. 7:8 - Stormwater Management Regulations

- Use nonstructural management strategies
- Protect communities from increases in stormwater volume and peak flows as a result of new development
- Maintain groundwater recharge
- Protect waterways from pollution carried in stormwater runoff



New Jersey Stormwater Management Rules

- Rules apply to any “Major Development” defined as a project disturbing more than 1 acre or increasing impervious surfaces by $\frac{1}{4}$ acre or more
- Design and Performance Standards established in NJAC 7:8-5, for:
 - Nonstructural Stormwater Management Strategies
 - Stormwater Quantity
 - Groundwater Recharge
 - Stormwater Quality
 - Stormwater Maintenance Plan



Nonstructural Strategies

- Plan the project using Low Impact Development (LID) Principles
- Collect, infiltrate, and where possible reuse stormwater near its source
- Capture runoff from small storm events in vegetated systems to protect water quality and promote recharge
- Minimize and disconnect impervious surfaces



Water Quantity Performance Standards

- Demonstrate that post-development 2, 10, and 100-year storm event hydrographs do not exceed pre-development hydrographs

or

- Demonstrate that hydrograph peaks will not increase and that increase in volume or change in timing won't increase flood damage downstream

or

- Design BMPs so that 2, 10, and 100-year pre-development hydrographs are reduced to 50%, 75%, and 80%, respectively
 - 2-year rainfall (3.3 inches)
 - 10-year rainfall (5.0 inches)
 - 100-year rainfall (8.3 inches)



Groundwater Recharge Performance Standards

- Maintain 100% of average annual groundwater recharge volume

or

- Infiltrate increase in the post development runoff volume for the 2-year storm



Water Quality Performance Standards

- Install BMPs to reduce at least 80% of total suspended solids (TSS) loads
- Install BMPs to provide nutrient removal to maximum extent feasible

<u>BMP</u>	<u>TSS Removal Rate</u>
Bioretention	90%
Constructed Wetlands	90%
Forested Buffers	70%
Extended Detention Basin	40-60%
Infiltration Structure	80%
Sand Filter	80%
Vegetative Filter Strip	50%
Wet Pond	60-90%

SOURCE: NJ Stormwater Management Rules
and BMP Manual



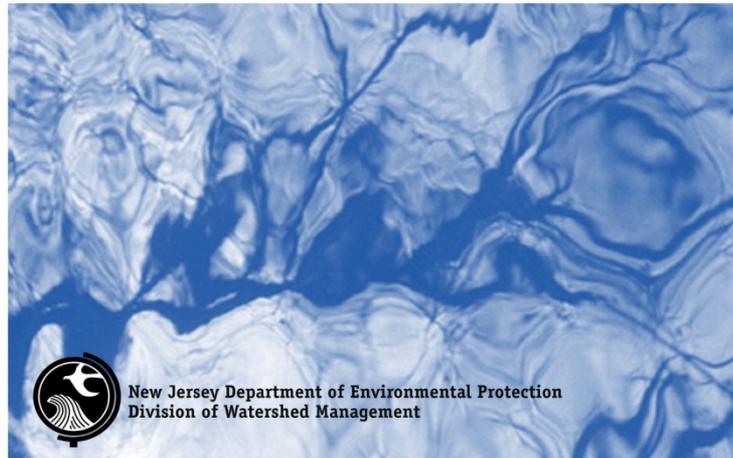
NJ Stormwater Guidance



New Jersey

Stormwater

Best Management Practices Manual



New Jersey Department of Environmental Protection
Division of Watershed Management

2019 Revisions

1. The current requirement that major developments incorporate nonstructural stormwater management strategies to the “maximum extent practical” to meet groundwater recharge standards, stormwater runoff quantity standards, and stormwater runoff quality standards, with a requirement that green infrastructure be utilized to meet these same standards.
2. Total suspended solids (TSS) removal only applies to runoff from motor vehicle surfaces



NJDEP Green Infrastructure Definition

A stormwater management measure that manages stormwater close to its source by:

1. Treating stormwater runoff through infiltration into subsoil
2. Treating stormwater runoff through filtration by vegetation or soil
3. Storing stormwater runoff for reuse



Green Infrastructure Standard

- Green infrastructure best management practices (BMP) must be used to satisfy recharge, quantity, and quality
- Three tables identifying the performance of each BMP in meeting the three standards
 - Water Quality & Recharge – BMPs in Table 1
 - Quantity – BMPs in Table 1 or Table 2
 - If received a variance – BMPs in Table 1, Table 2, or Table 3
- Maintain existing ability to propose an alternative stormwater design
 - Alternative design must meet green infrastructure definition and must meet drainage area limitation if similar to BMP with limit

Table 1

Best Management Practice	Quality TSS removal rate (%)	Quantity	Recharge	Minimum separation from seasonal high-water table (ft)
Bioretention Systems	80 or 90	Yes	Yes	2
			No	1
Cisterns	0	Yes	No	-
Dry Wells	0	No	Yes	2
Grass Swales	50 or less	No	No	2
Green Roofs	0	Yes	No	-
Infiltration Basins	80	Yes	Yes	2
Manufactured Treatment Device	50 or 80	No	No	Dependent upon the device
Pervious Paving Systems	80	Yes	Yes	2
			No	1
Sand Filters	80	Yes	Yes	2
Vegetative Filter Strips	60-80	No	No	-

Table 1 BMPs shall be used for recharge, quantity, and quality

Drainage area limitation applies to: bioretention basins, dry wells, infiltration basins, manufactured treatment devices, and sand filters.

Table 2

Best Management Practice	Quality TSS removal rate (%)	Quantity	Recharge	Minimum separation from seasonal high water table (ft)
Bioretention Systems	80 or 90	Yes	Yes	2
			No	1
Infiltration Basins	80	Yes	Yes	2
Standard Constructed Wetlands	90	Yes	No	N/A
Wet Ponds	50-90	Yes	No	N/A

Table 2 BMPs may only be used for quantity

Table 3

Best Management Practice	Quality TSS removal rate (%)	Quantity	Recharge	Minimum separation from seasonal high water table (ft)
Blue Roofs	0	Yes	No	N/A
Extended Detention Basins	40-60	Yes	No	1
Manufactured Treatment Device	50 or 80	No	No	Dependent upon the device
Sand Filters	80	Yes	No	1
Subsurface Gravel Wetlands	90	No	No	1
Wet ponds	50-90	Yes	No	N/A

Table 3 BMPs may only be used if a variance is granted

Let's talk about the practicality of these new regulations



Table 1
Water Resources Program

Best Management Practice	Quality TSS removal rate (%)	Quantity	Recharge	Minimum separation from seasonal high-water table (ft)
Bioretention Systems	80 or 90	Yes	Yes	2
			No	1
Cisterns	0	Yes	No	-
Dry Wells	0	No	Yes	2
Grass Swales	50 or less	No	No	2
Green Roofs	0	Yes	No	-
Infiltration Basins	80	Yes	Yes	2
Manufactured Treatment Device	50 or 80	No	No	Dependent upon the device
Pervious Paving Systems	80	Yes	Yes	2
			No	1
Sand Filters	80	Yes	Yes	2
Vegetative Filter Strips	60-80	No	No	-

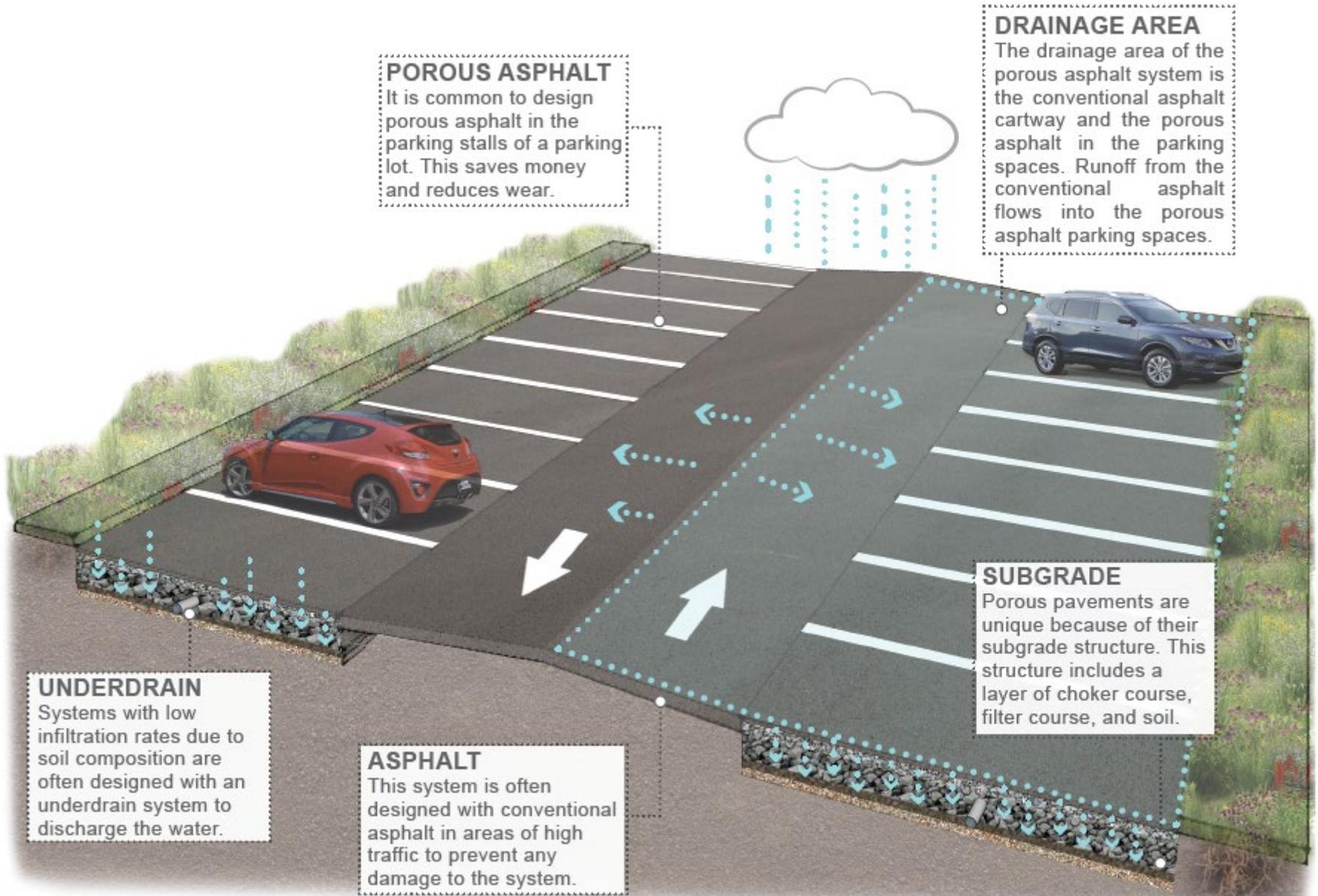
Pervious Paving Systems

POROUS ASPHALT

It is common to design porous asphalt in the parking stalls of a parking lot. This saves money and reduces wear.

DRAINAGE AREA

The drainage area of the porous asphalt system is the conventional asphalt cartway and the porous asphalt in the parking spaces. Runoff from the conventional asphalt flows into the porous asphalt parking spaces.



UNDERDRAIN

Systems with low infiltration rates due to soil composition are often designed with an underdrain system to discharge the water.

ASPHALT

This system is often designed with conventional asphalt in areas of high traffic to prevent any damage to the system.

SUBGRADE

Porous pavements are unique because of their subgrade structure. This structure includes a layer of choker course, filter course, and soil.

Permeable Pavements

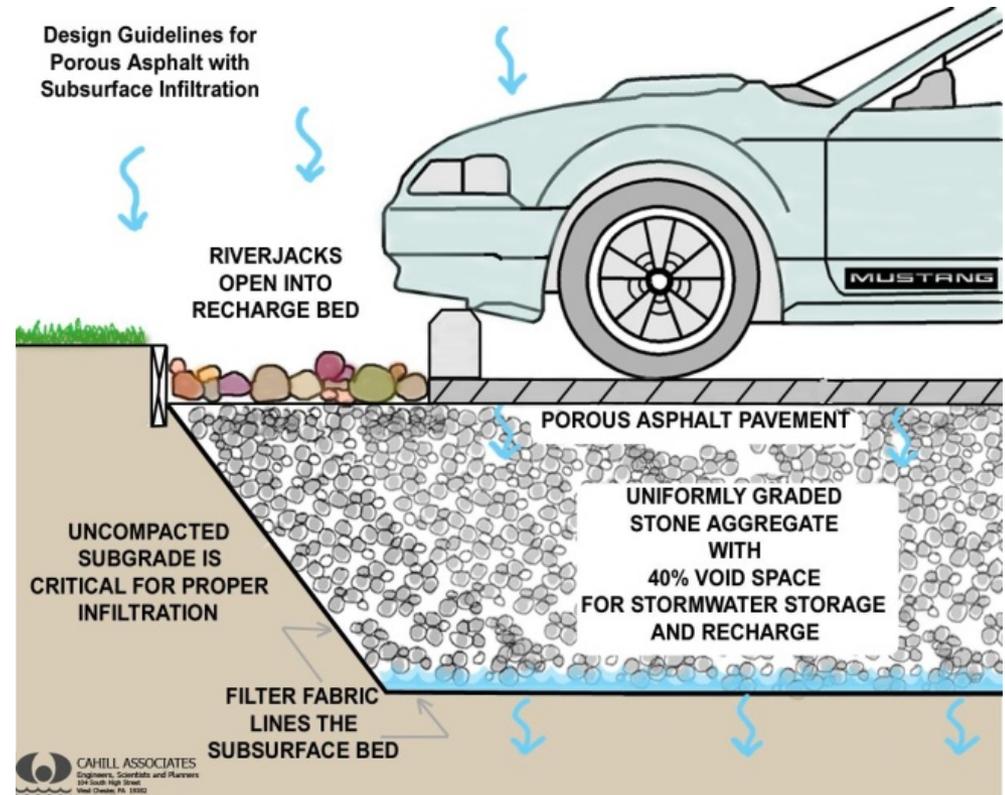
- Underlying stone reservoir
- Porous asphalt and pervious concrete are manufactured without "fine" materials to allow infiltration
- Grass pavers are concrete interlocking blocks with open areas to allow grass to grow
- Ideal application for porous pavement is to treat a low traffic or overflow parking area



ADVANTAGES

- Manage stormwater runoff
- Minimize site disturbance
- Promote groundwater recharge
- Low life cycle costs, alternative to costly traditional stormwater management methods
- Mitigation of urban heat island effect
- Contaminant removal as water moves through layers of system

COMPONENTS



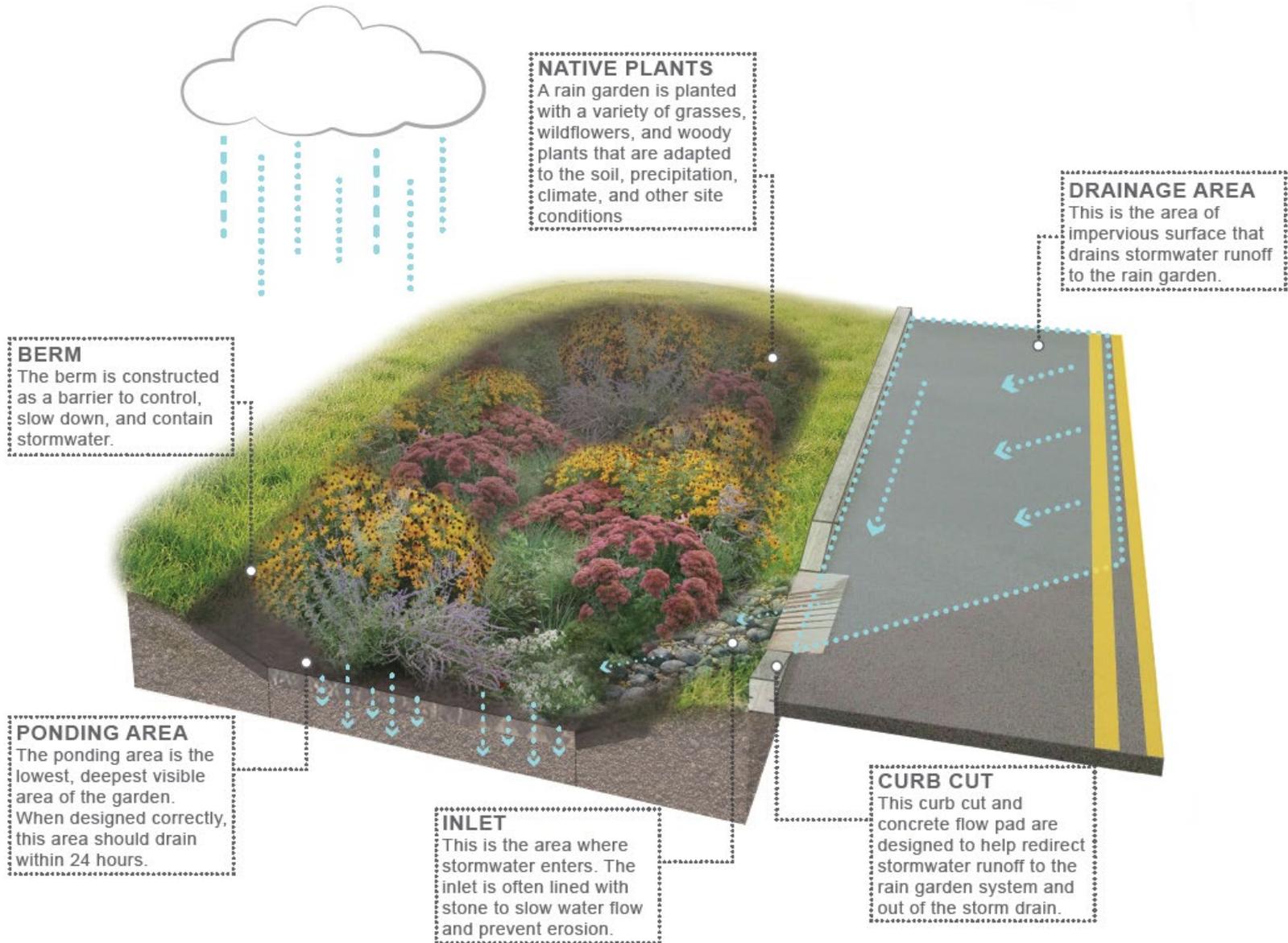
Porous Asphalt



Grass Pavers



Bioretention Systems



Lots of Bioretention Systems

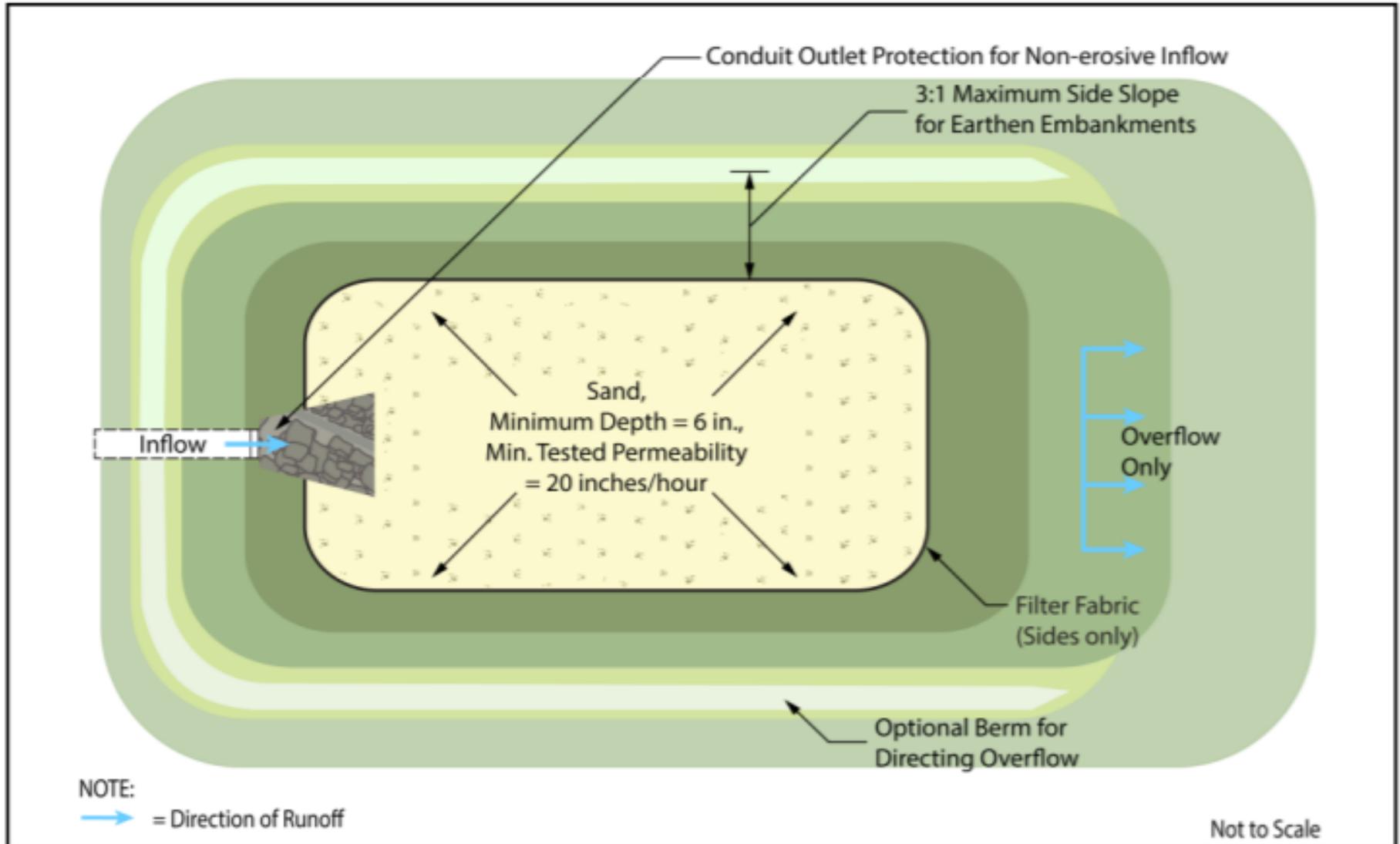




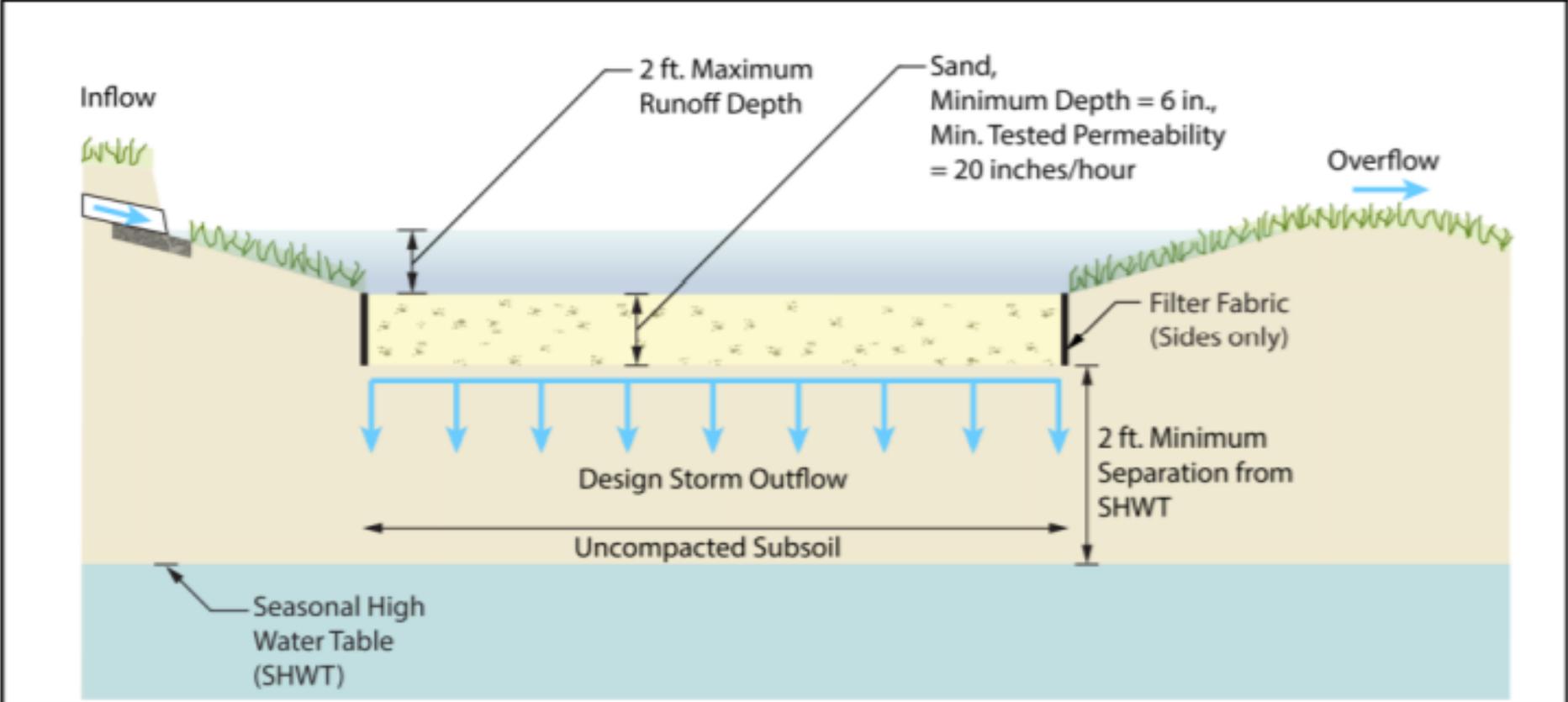


Infiltration Systems

Surface Infiltration Basin – Plan View



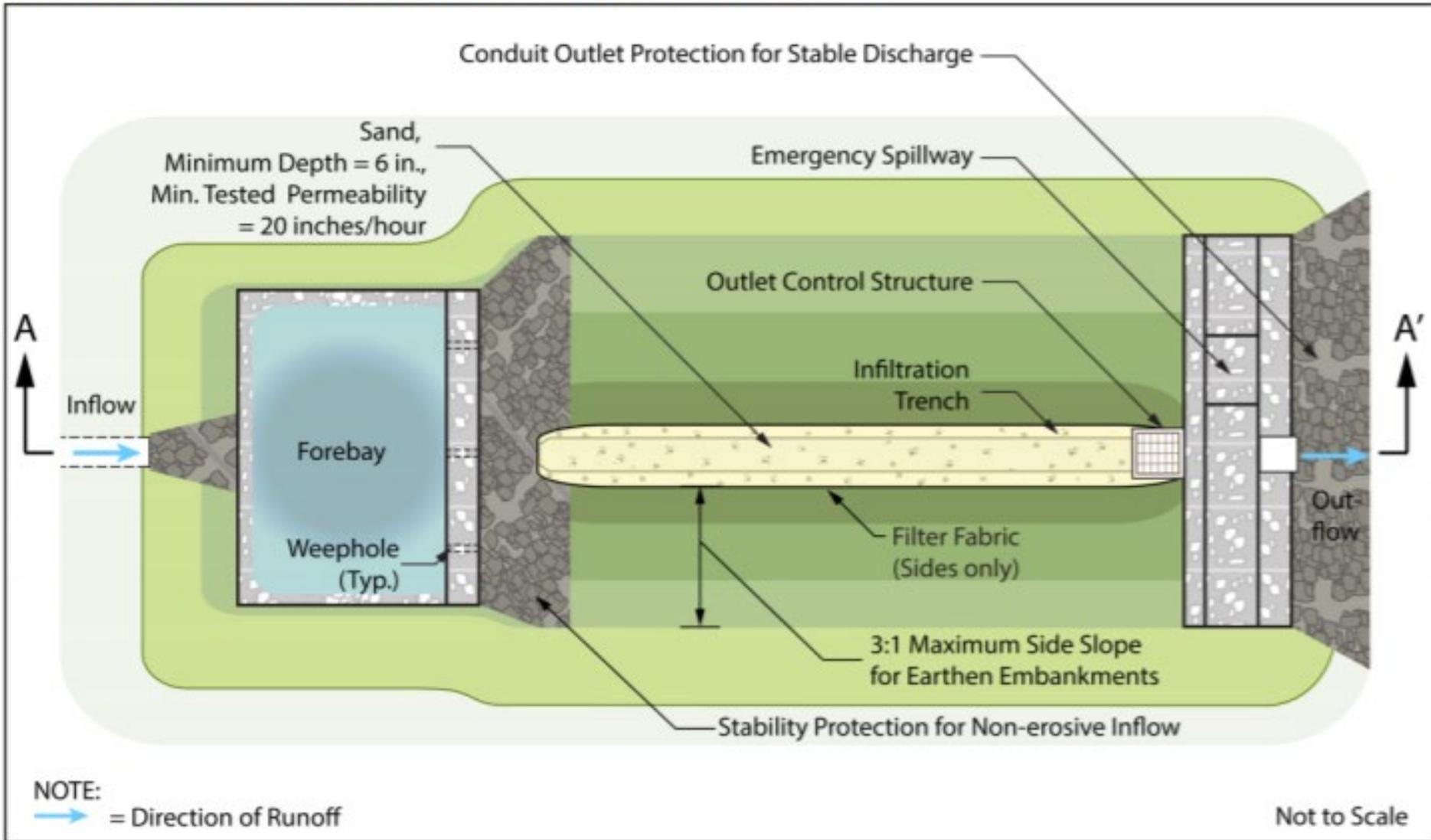
Surface Infiltration Basin – Profile View



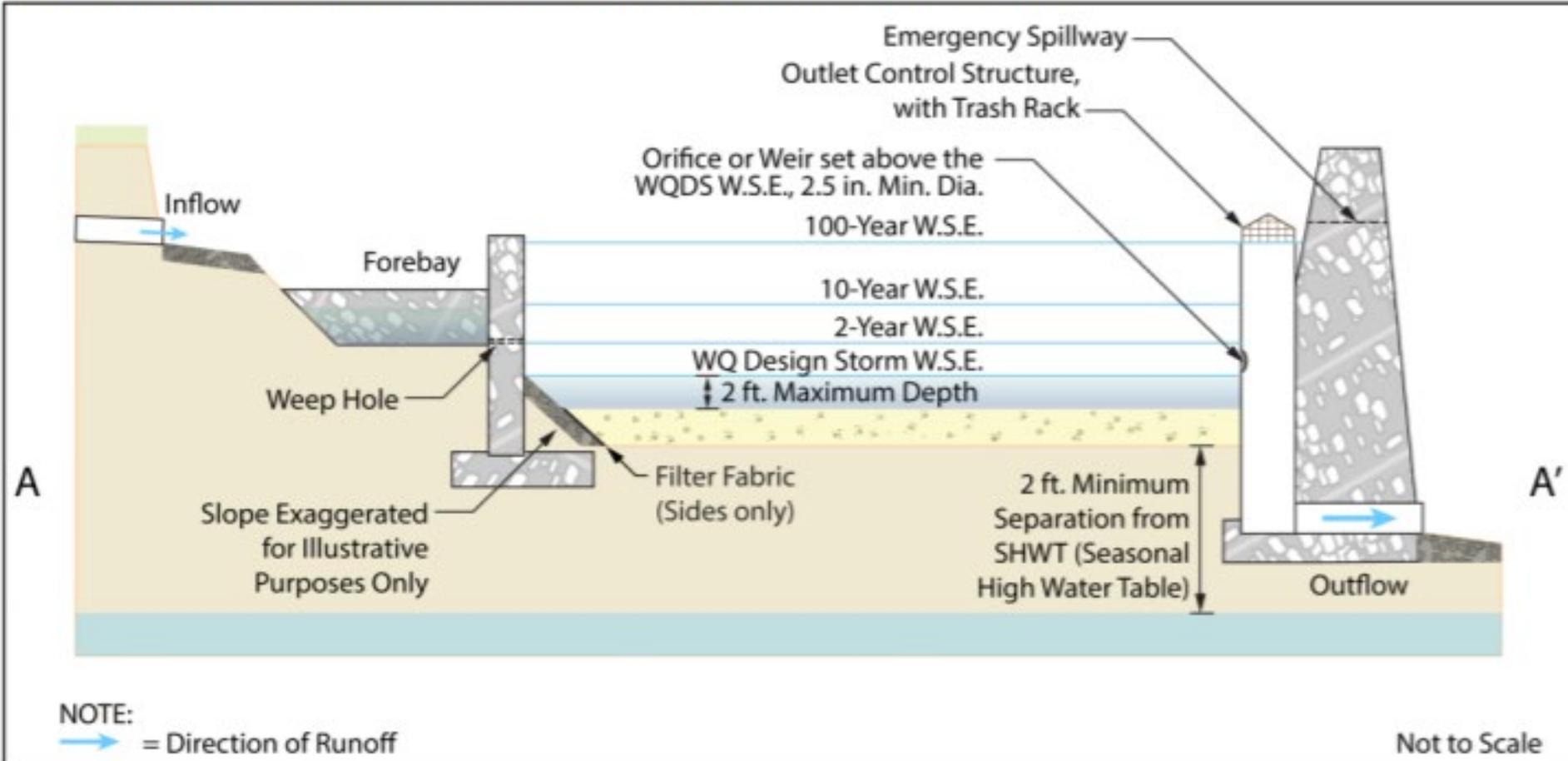
NOTE:
→ = Direction of Runoff

Not to Scale

Infiltration - Extended Detention Basin: Plan View

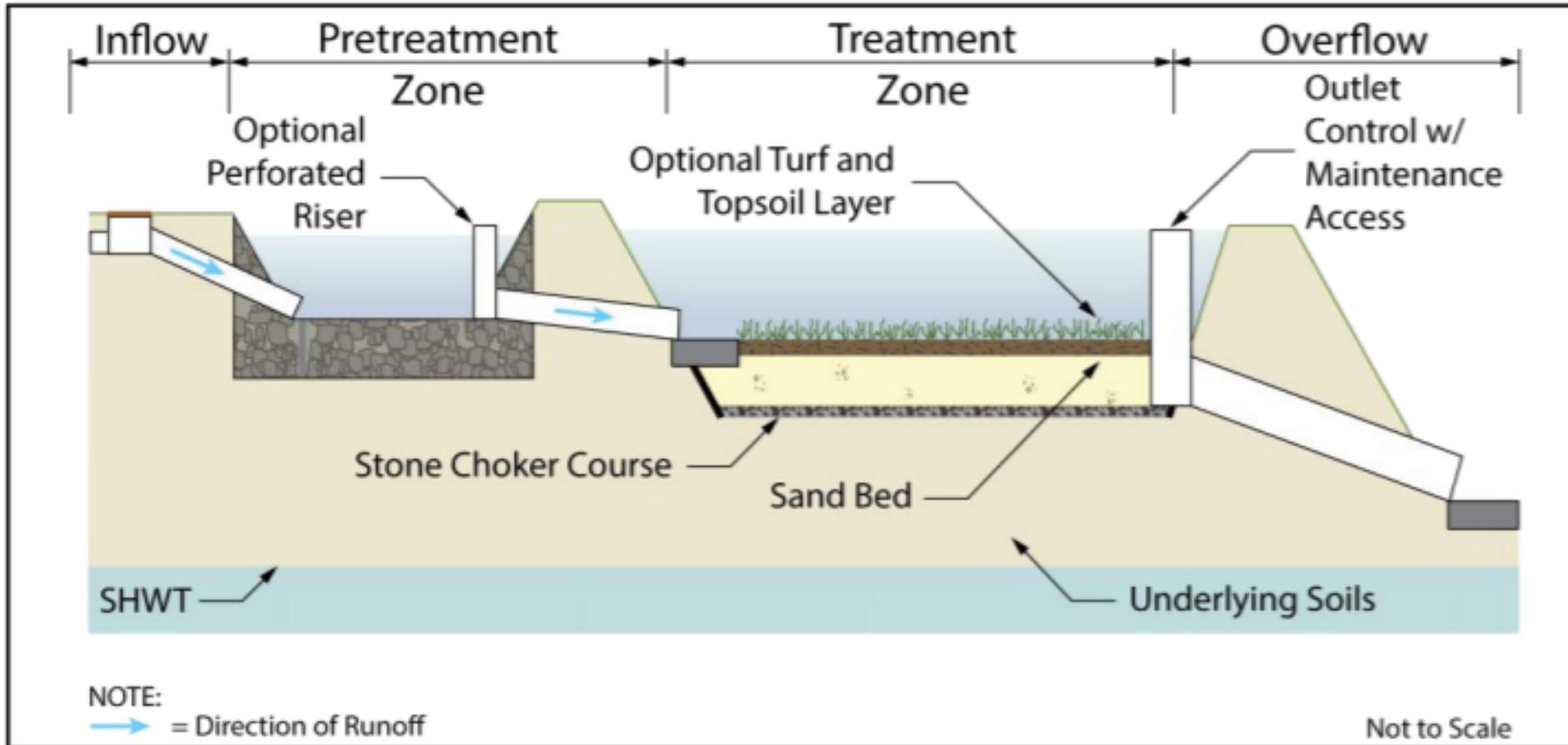


Infiltration – Extended Detention Basin: Profile View

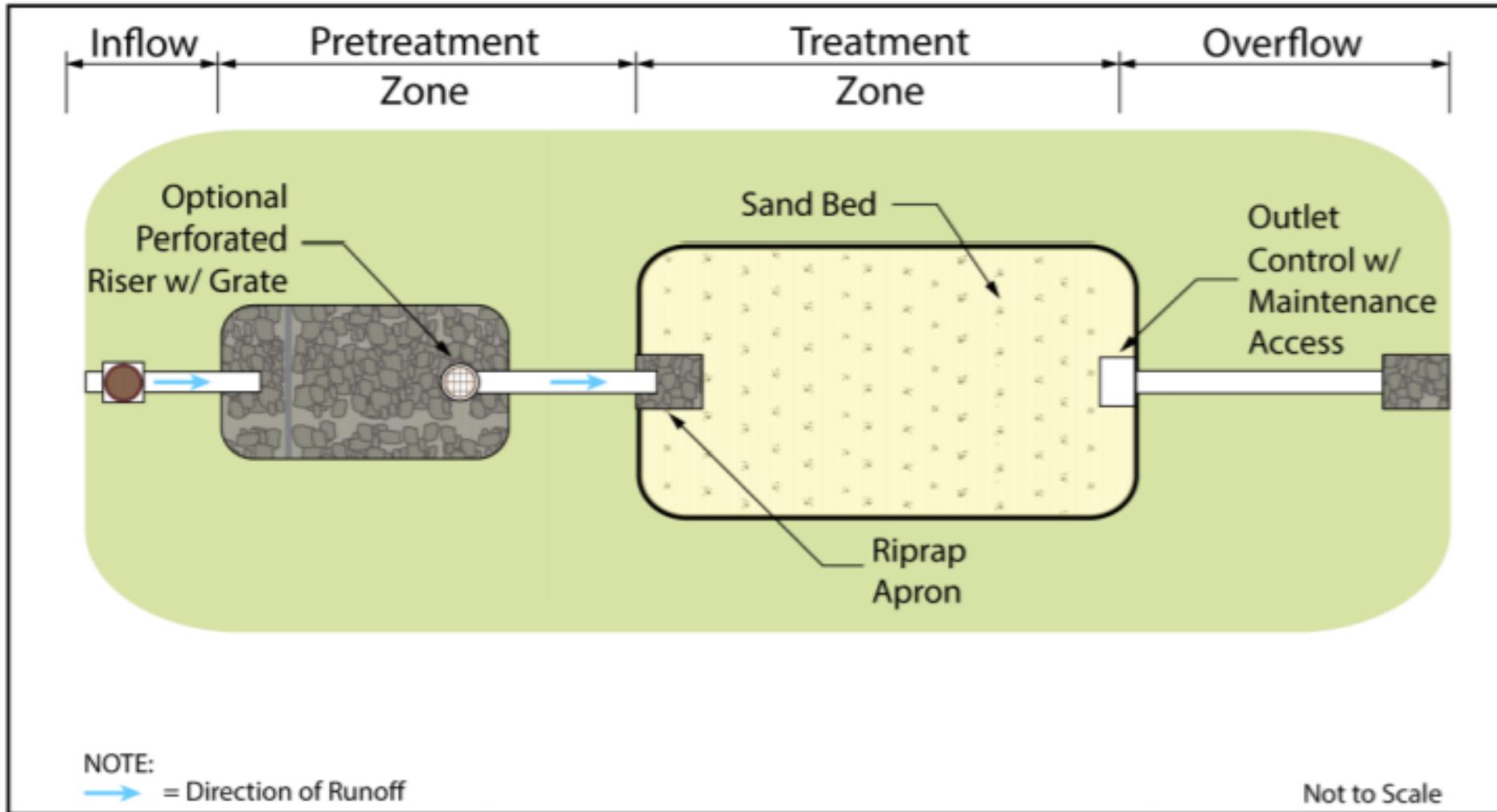


Sand Filter

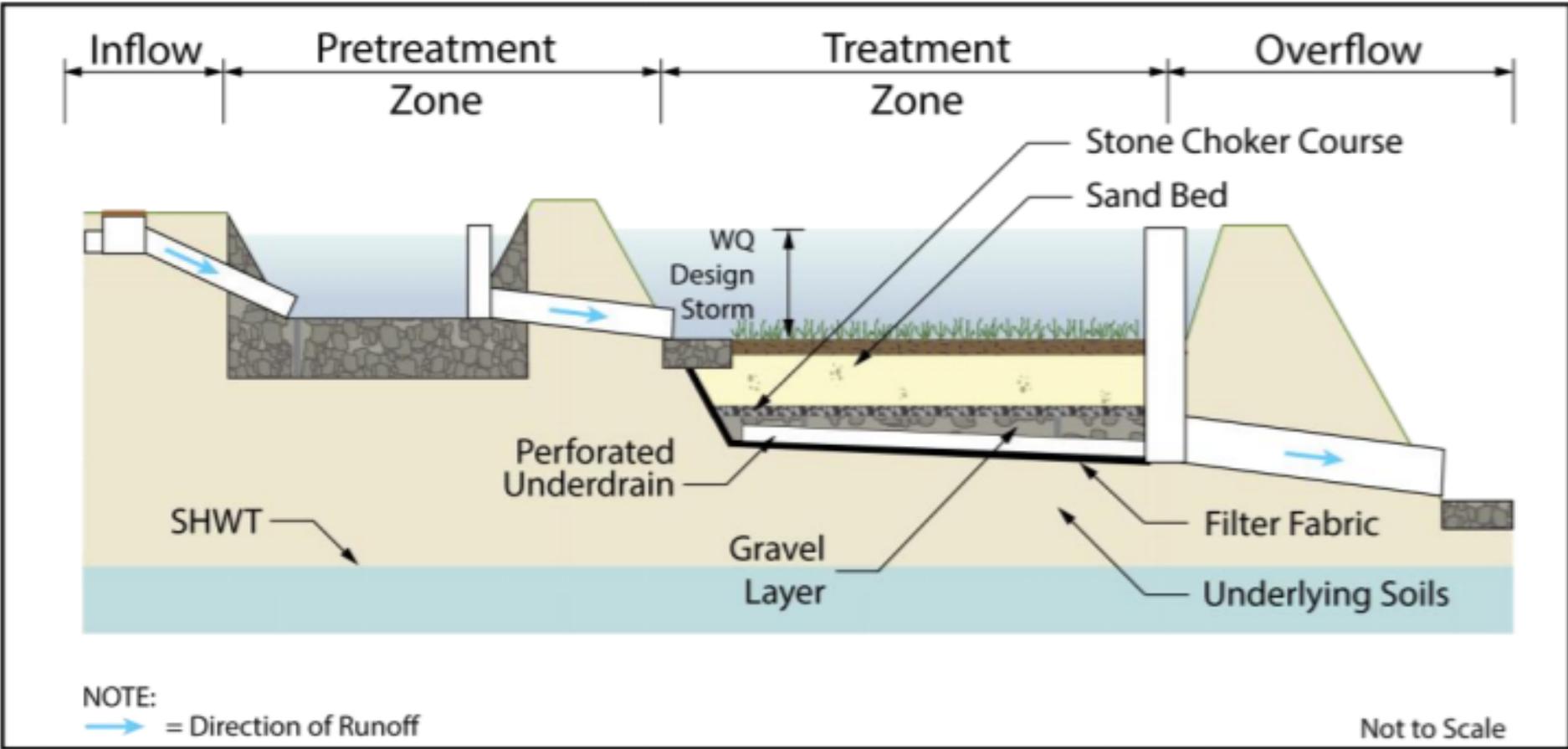
Profile View – Sand Filter Basics



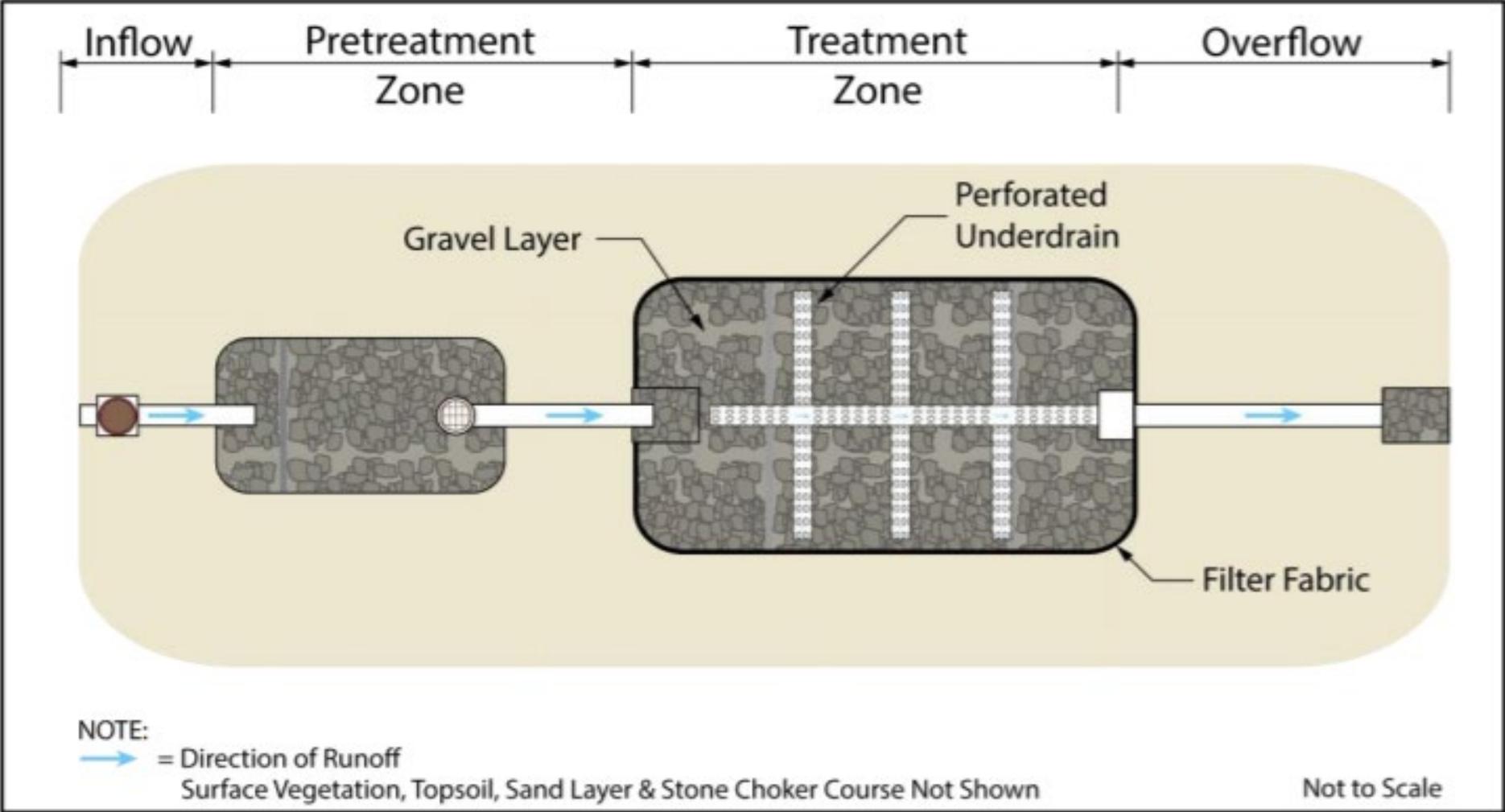
Plan View – Sand Filter Basics



Profile View – Sand Filter with Underdrain



Plan View – Sand Filter with Underdrain





QUESTIONS?