

Stormwater Management Rules Applicability and Amendments

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Bureau of Nonpoint Pollution Control

Division of Water Quality

New Jersey Department of Environmental Protection

How is post-construction stormwater managed in NJ?

- Stormwater Management rules at N.J.A.C. 7:8
 - Compliance required through permits issued by the Division of Land Use Regulation
 - Direct Implementation by NJDEP
 - Compliance required through MS4 Permits issued by the Bureau of Nonpoint Pollution Control in the Division of Water Quality
 - Implementation by municipality
 - RSIS for residential projects
 - Stormwater Control Ordinance for non-residential projects

What projects must comply?

- “Major Development”
- Under existing rules:
 - If reviewed by NJDEP – any development or developments that ultimately disturb one acre or more of land or create ¼ acre or more increase of impervious surface
 - If reviewed by the municipality
 - Through RSIS – ultimate disturbance of one acre or more
 - Through Stormwater Ordinance – as defined in ordinance (but must at least cover projects that where the ultimate disturbance is one acre or more)

Proposed Amendments to Stormwater Management rules

- Dec. 3, 2018: NJDEP proposed amendments to the Stormwater Management rules.
- Feb. 1, 2019: 60-day public comment period closed
- Dec. 3, 2019: NJDEP filed adoption package to OAL
- Adoption includes a 1 year delayed operative date
 - Current rules are in effect during this year
 - Same timeframe municipalities have to update ordinances in accordance with MS4 permits

Goals of the Amendments

1. Consistency
2. Predictability
3. Water Quality Improvements

Existing Rule Layout

SUBCHAPTER 5. DESIGN AND PERFORMANCE STANDARDS FOR STORMWATER MANAGEMENT MEASURES

7:8-5.1 Scope

7:8-5.2 Stormwater management measures for major development

7:8-5.3 Nonstructural stormwater management strategies

7:8-5.4 Erosion control, groundwater recharge and runoff quantity standards

7:8-5.5 Stormwater runoff quality standards

7:8-5.6 Calculation of stormwater runoff and groundwater recharge

7:8-5.7 Standards for structural stormwater management measures

7:8-5.8 Maintenance requirements

7:8-5.9 Sources for technical guidance

Rule Layout Re-arrangement

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7:8-5.2 Stormwater management measures for major development

7:8-5.3 ~~Nonstructural stormwater management strategies~~ GI

7:8-5.4 Erosion control, groundwater recharge and runoff quantity standards

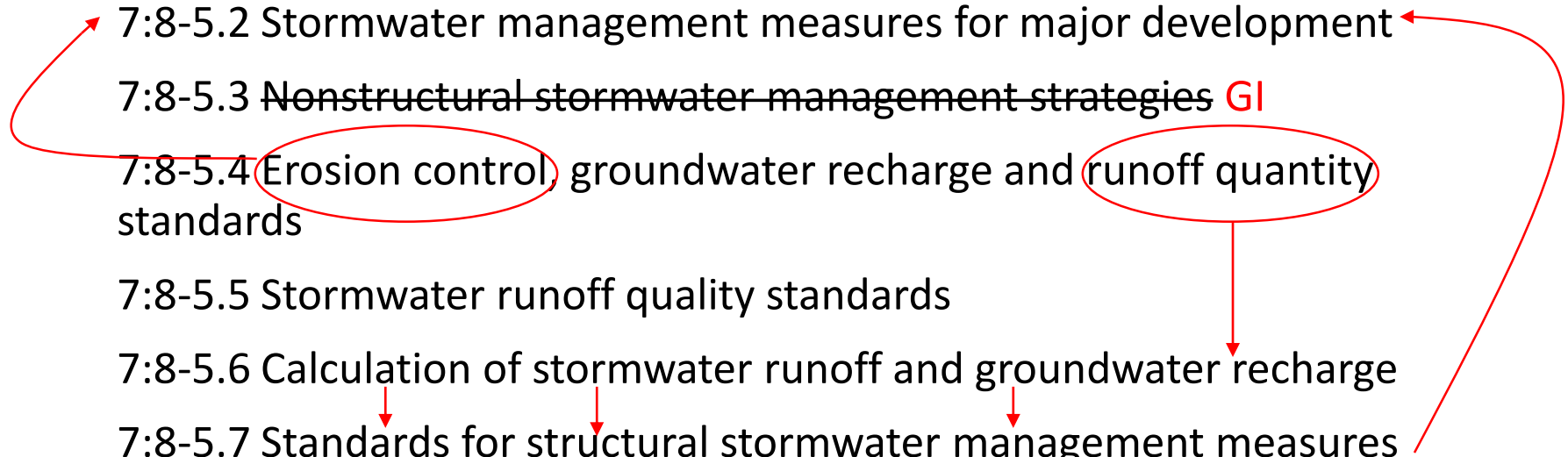
7:8-5.5 Stormwater runoff quality standards

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Amended Rule Layout

SUBCHAPTER 5. DESIGN AND PERFORMANCE STANDARDS FOR STORMWATER MANAGEMENT MEASURES

7:8-5.1 Scope

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7:8-5.3 Green infrastructure

7:8-5.4 Groundwater recharge standards

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7:8-5.6 Stormwater runoff quantity standards

7:8-5.7 Calculation of stormwater runoff and groundwater recharge

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7:8-5.9 Sources for technical guidance

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, or
3. Storing stormwater runoff for reuse.

Green Infrastructure Standard

- GI BMPs must be used to satisfy recharge, quantity, and quality
- 3 Tables identifying the performance of each BMP in meeting the 3 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 GI definition and must meet drainage area limitation if similar to BMP with limit.

Table 1

Best Management Practice	Quality TSS removal rate (percent)	Quantity	Recharge	Minimum separation from seasonal high water table (feet)
Cisterns	0	Yes	No	-
Dry Wells	0	No	Yes	2
Grass Swales	50 or less	No	No	2
Green Roofs	0	Yes	No	-
Manufactured Treatment Device (MTDs)	50 or 80	No	No	Dependent upon the device
Pervious Paving Systems	80	Yes	Yes	2
			No	1
Small-scale Bioretention Systems	80 or 90	Yes	Yes	2
			No	1
Small-scale Infiltration Basins	80	Yes	Yes	2
Small-scale 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: dry wells, MTDs, pervious paving system, and small-scale bioretention, infiltration, and sand filters.

Table 1 only includes MTDs that meet the definition of GI

Table 2

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

Wet ponds used under Table 2 must be designed to have native vegetation and a reuse component

Table 2 BMPs may only be used for quantity

Table 3

Best Management Practice	Quality TSS removal rate (percent)	Quantity	Recharge	Minimum separation from seasonal high water table (feet)
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

Water Quality – Motor Vehicle Surface

- The water quality standard will apply to motor vehicle surface instead of impervious surface
 - Rule text will not require roofs or sidewalks to be treated – consistent with current implementation
 - Will require pervious motor vehicle surfaces to be treated – consistent with scientific studies
- Include in definition of major development

Clarification to Applicability

- Add definition of “regulated motor vehicle surface”
- Add definition of “regulated impervious surface”
- Change definition of major development to be 1 acre of disturbance, or $\frac{1}{4}$ acre of regulated impervious surface, or $\frac{1}{4}$ acre of regulated motor vehicle surface
- Definitions of regulated motor vehicle surface and regulated impervious surface will include FAQ 10.2 (newly collected impervious surface and changes to existing drainage systems count as “new”)

Clarification to Applicability

- Require quantity, quality, and groundwater recharge to be met in each drainage area on-site (unless they converge before leaving the property)
- Move mounding analysis requirement from recharge standard to apply to all infiltration BMPs

CSO Related Changes

- Clarify that water quality treatment is required for discharges into combined sewer systems
- Clarify that water quantity control is required in tidal areas except discharges directly into lower reach of major tidal waterbodies
- Create the option for a community basin, which will allow several properties in a CSS community to use a single large basin for quantity control
 - Other standards must still be met on-site (including GI)

Questions?

Introduction to Green Infrastructure

*Presented to Jersey Water Works
by Christopher C. Obropta, Ph.D., P.E.
on December 13, 2019*



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



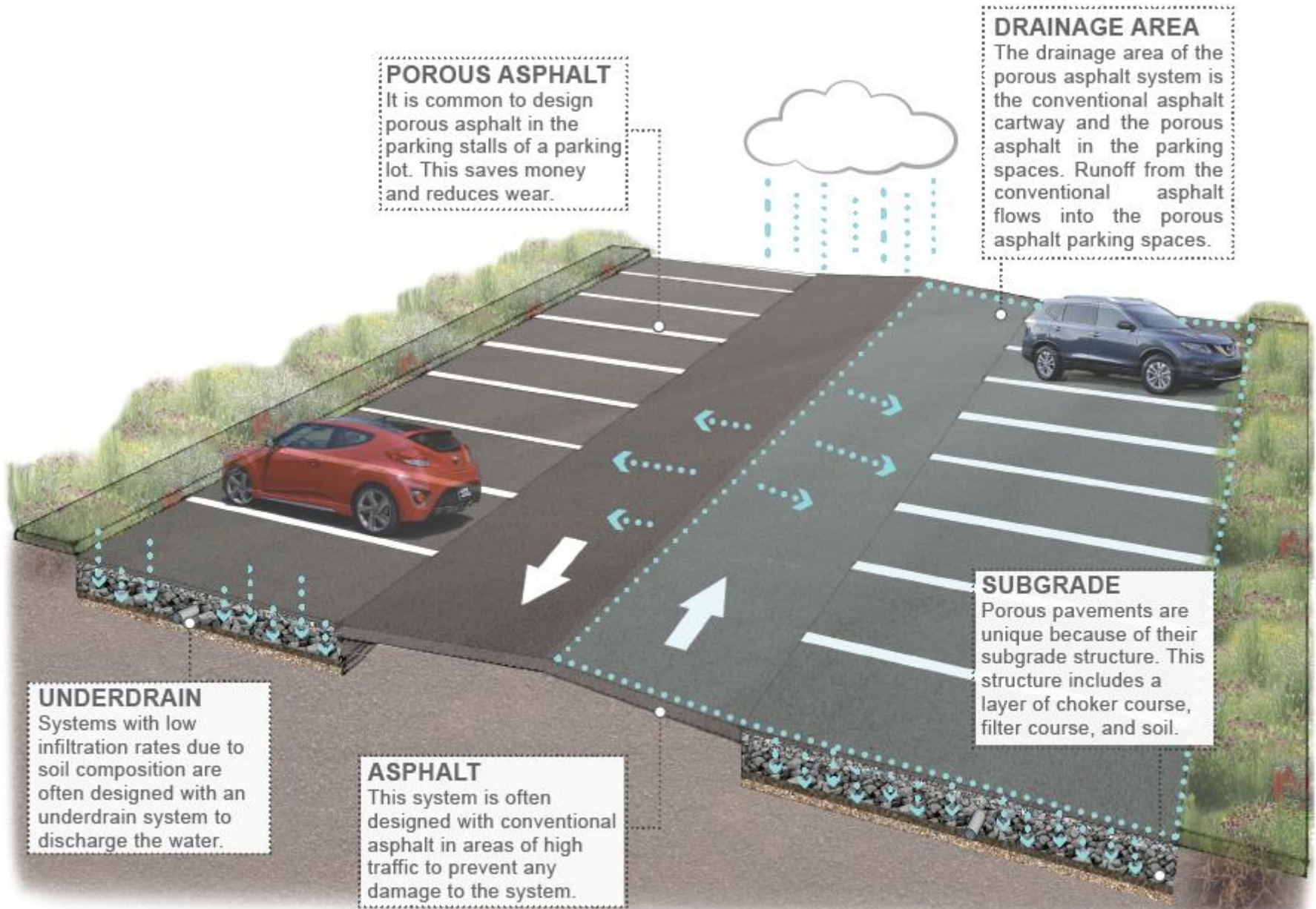
Table 5-1: Green Infrastructure BMPs for Groundwater Recharge, Stormwater Runoff Quality, and/or Stormwater Runoff Quantity

Best Management Practices	Stormwater Runoff Quality - TSS Removal Rate (%)	Stormwater Runoff Quantity	Groundwater Recharge	Minimum Separation from Seasonal High Water Table (feet)
Cistern	0	Yes	No	-
Dry Well (a)	0	No	Yes	2
Grass Swale	50 or less	No	No	2 (e) 1 (f)
Green Roof	0	Yes	No	-
Manufactured Treatment Device (a) (g)	50 or 80	No	No	Depends on the device
Vegetative Filter Strip	60 - 80	No	No	-

Table 5-1: Green Infrastructure BMPs for Groundwater Recharge, Stormwater Runoff Quality, and/or Stormwater Runoff Quantity (cont'd)

	Best Management Practices	Stormwater Runoff Quality - TSS Removal Rate (%)	Stormwater Runoff Quantity	Groundwater Recharge	Minimum Separation from Seasonal High Water Table (feet)
★	Pervious Paving System (a)	80	Yes	Yes (b) No (c)	2 (b) 1 (c)
★	Small-Scale Bioretention System (a)	80 or 90	Yes	Yes (b) No (c)	2 (b) 1 (c)
★	Small-Scale Infiltration Basin (a)	80	Yes	Yes	2
★	Small-Scale Sand Filter (a) (b)	80	Yes	Yes	2

Pervious Paving Systems



Permeable Pavements

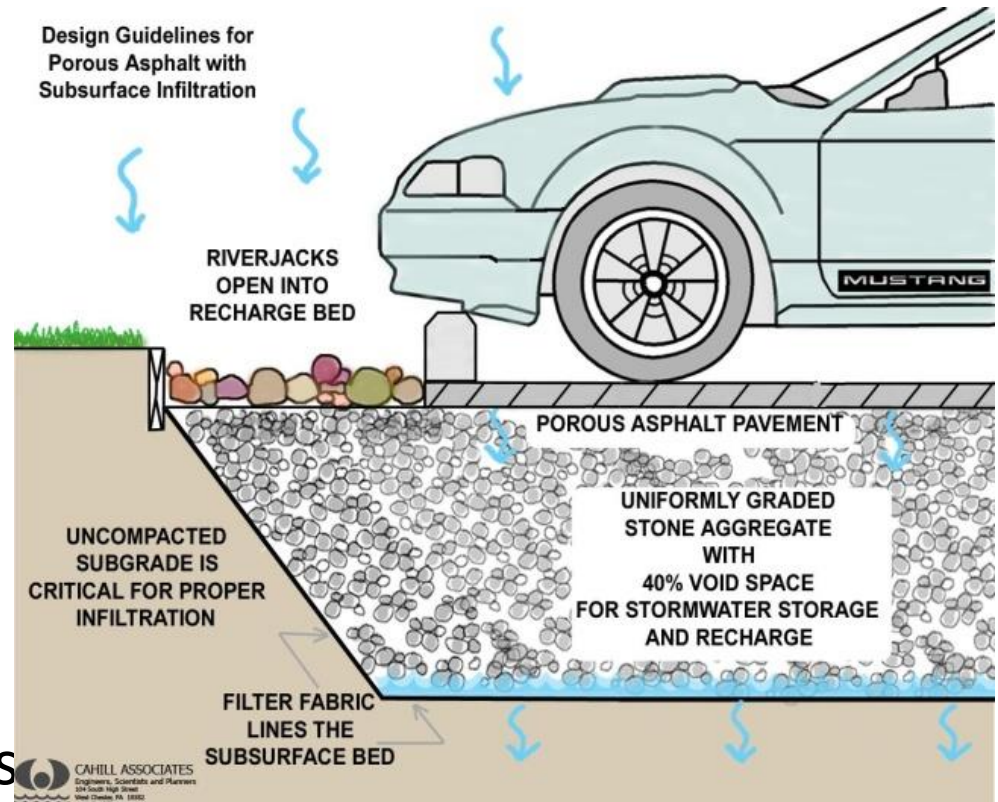
- Underlying stone reservoir
- Porous asphalt and pervious concrete are manufactured without "fine" materials to allow infiltration
- Grass pavers are concrete interlocking blocks with open areas to allow grass to grow
- Ideal application for porous pavement is to treat a low traffic or overflow parking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



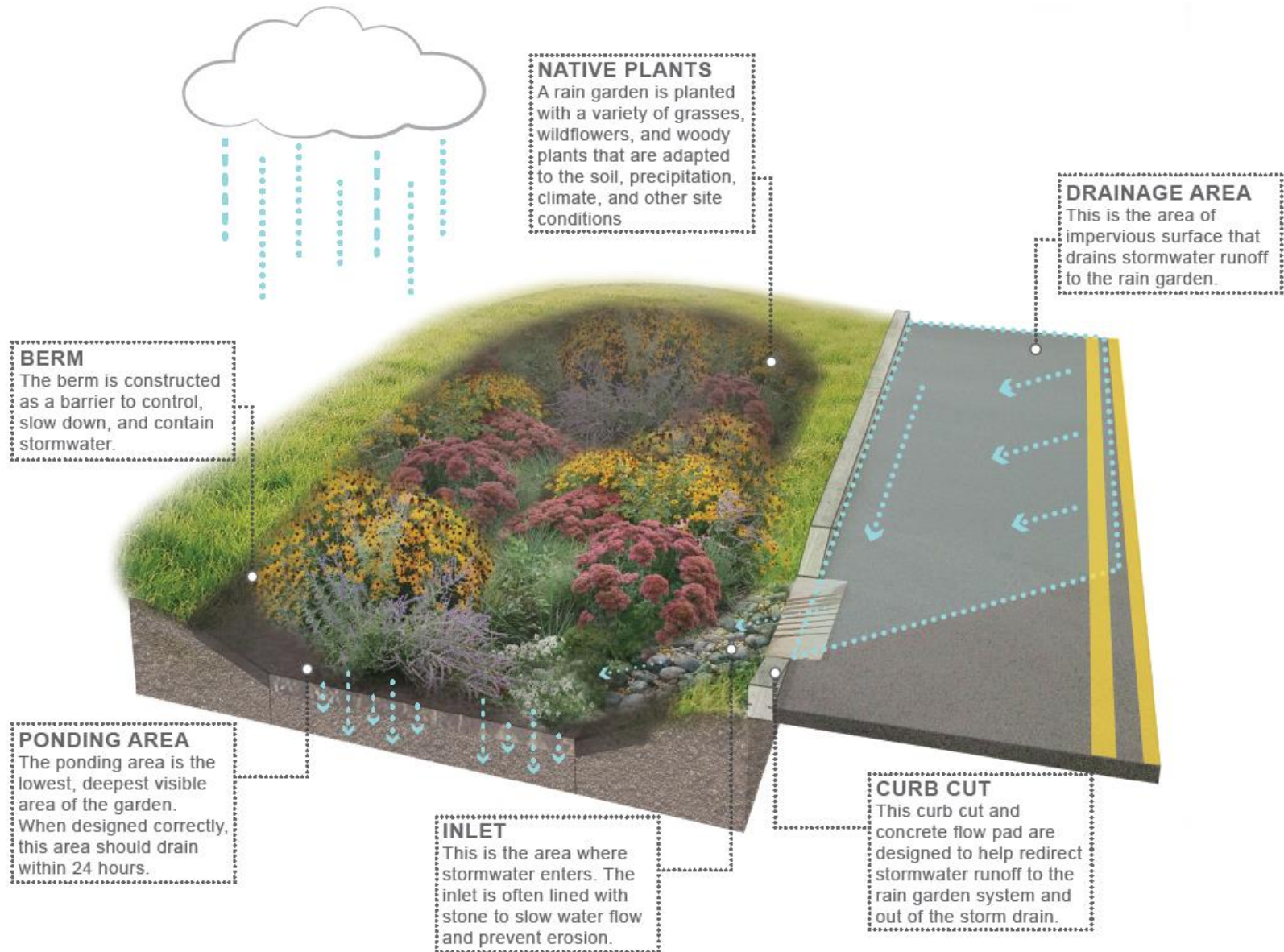
Porous Asphalt



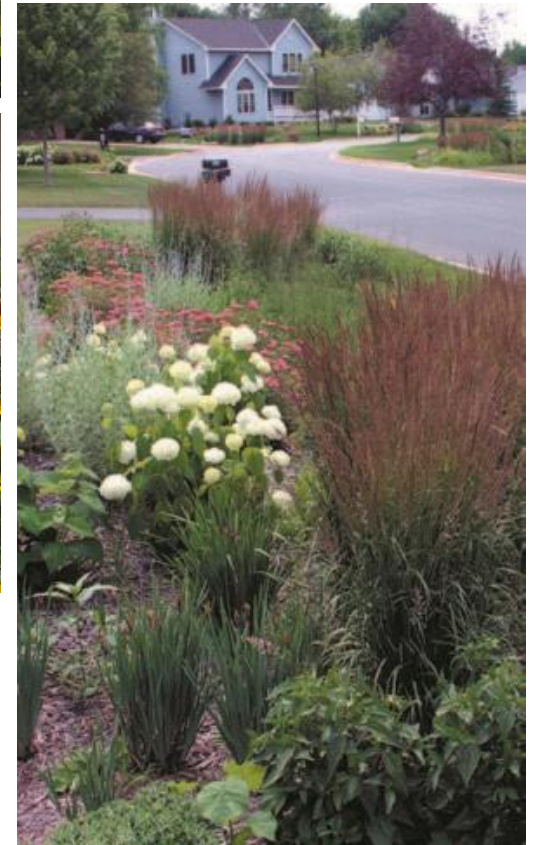
Grass Pavers



Small-Scale Bioretention Systems



Lots of Bioretention Systems

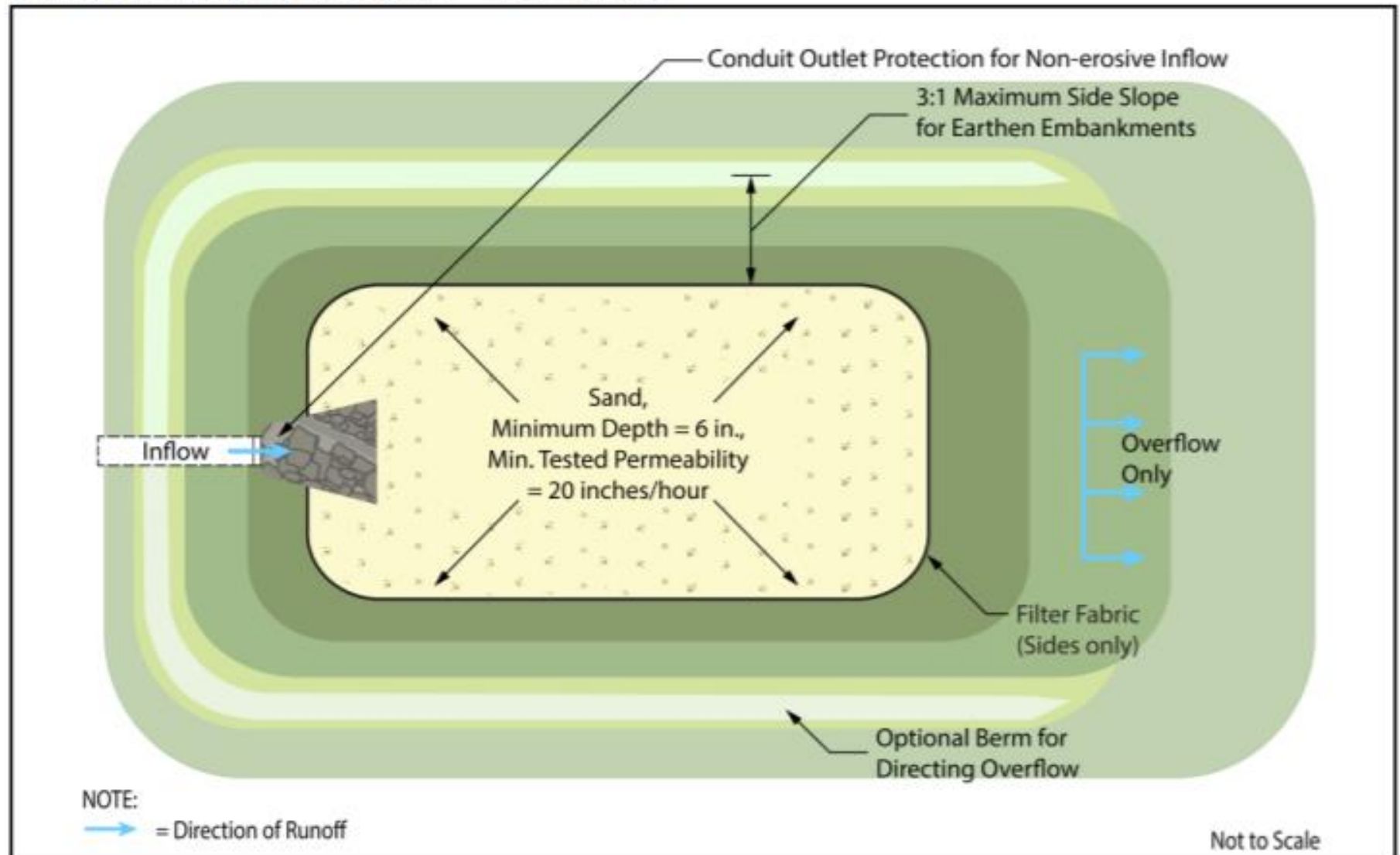




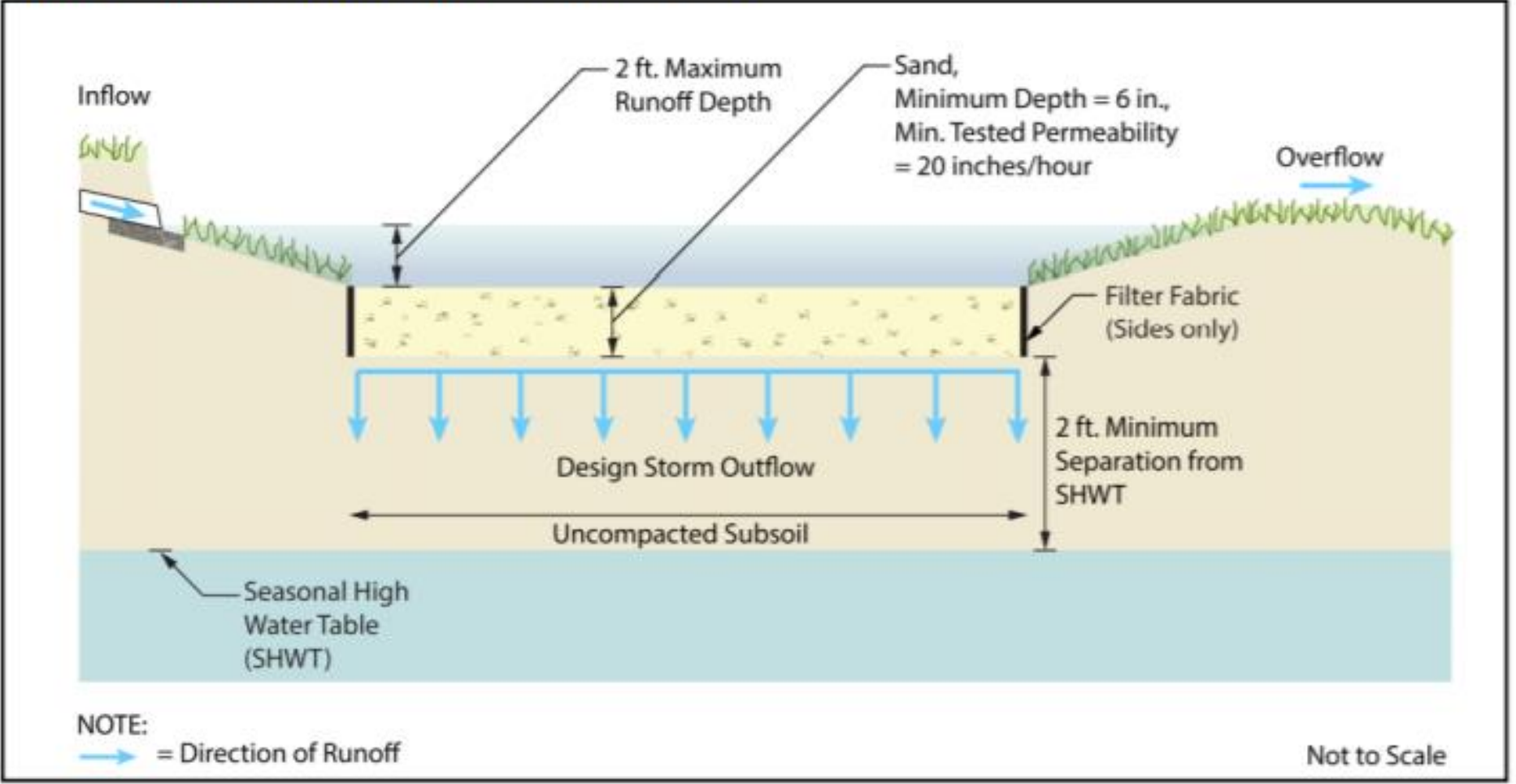


Small-Scale Infiltration Systems

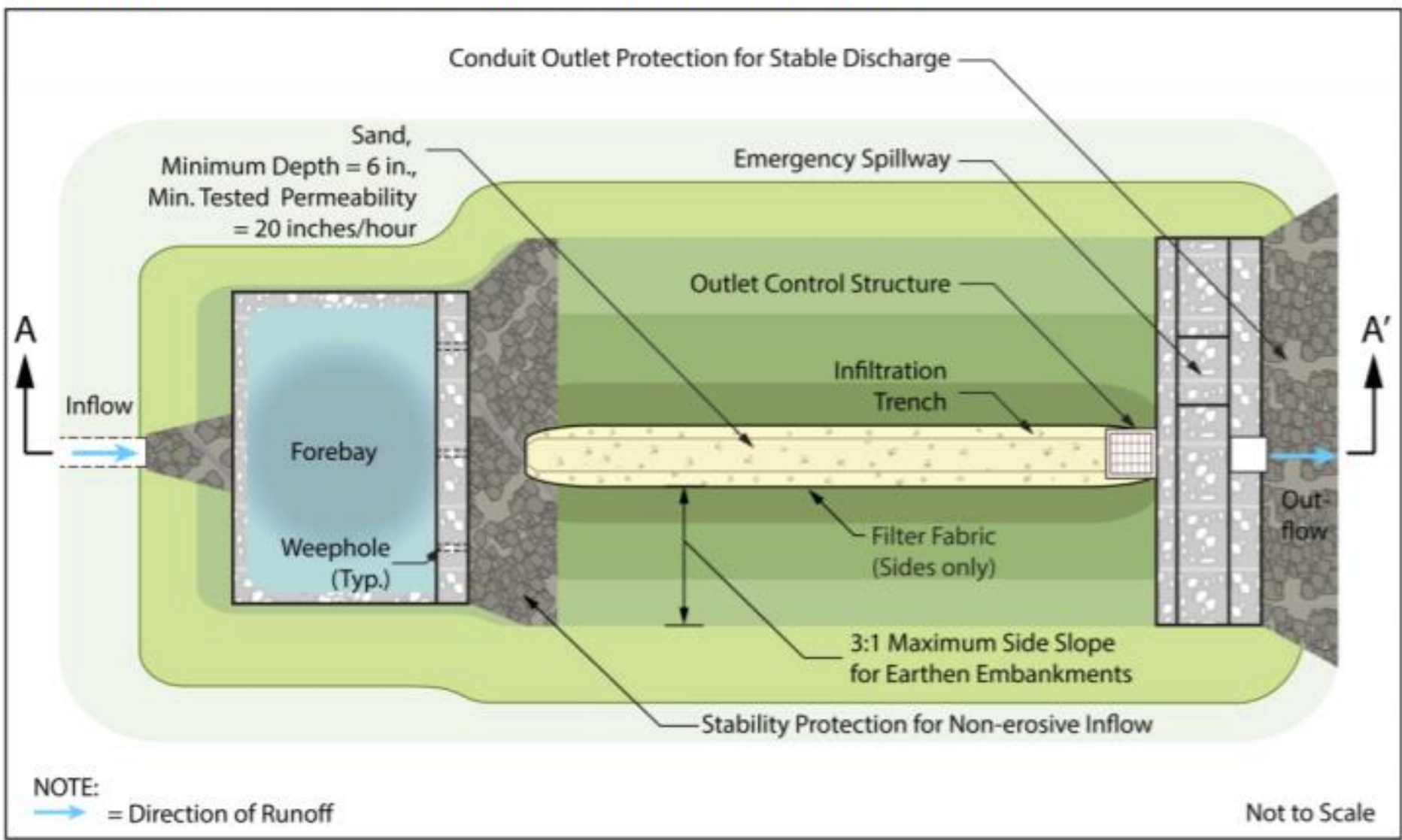
Surface Infiltration Basin – Plan View



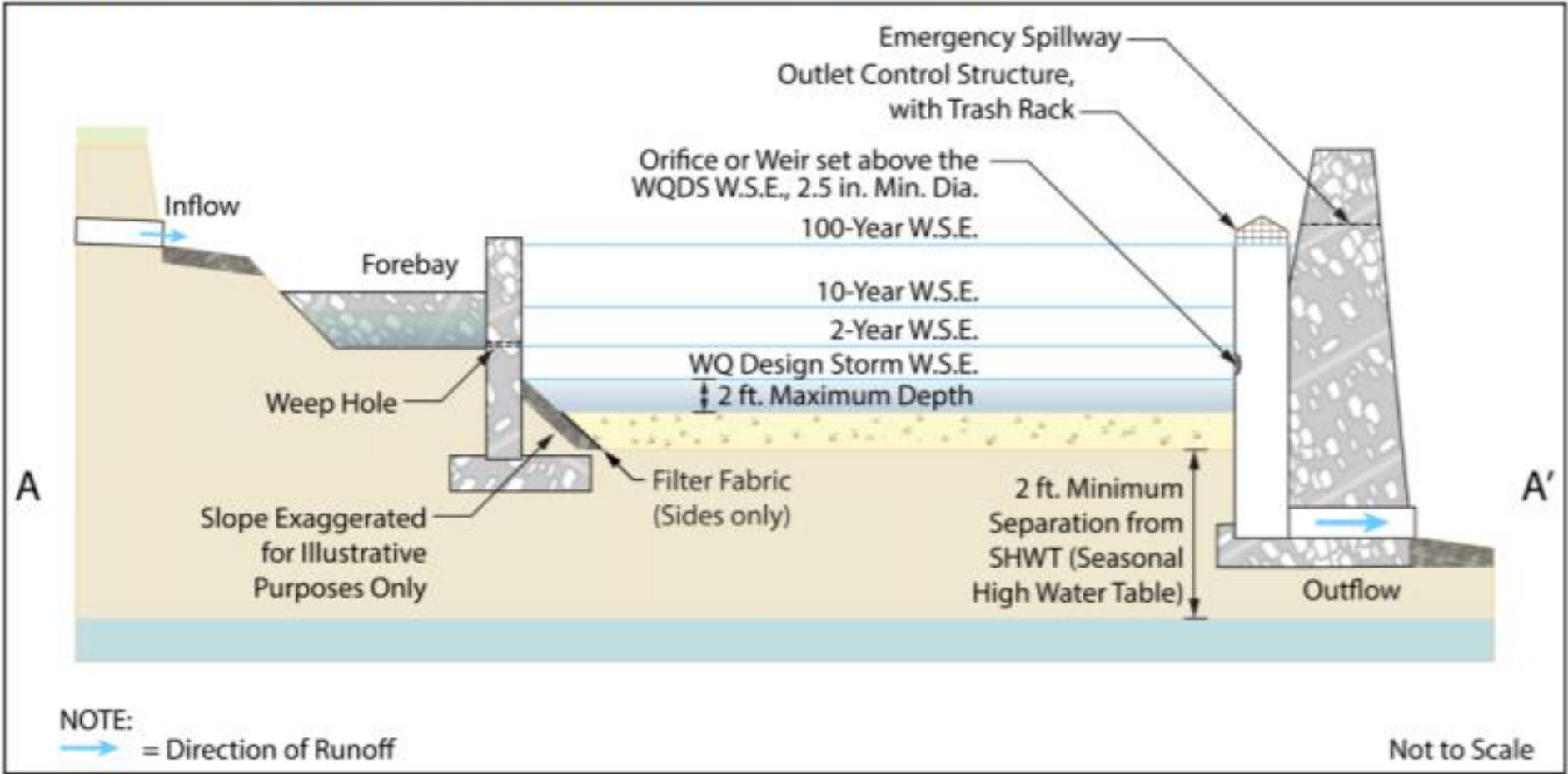
Surface Infiltration Basin – Profile View



Infiltration - Extended Detention Basin: Plan View

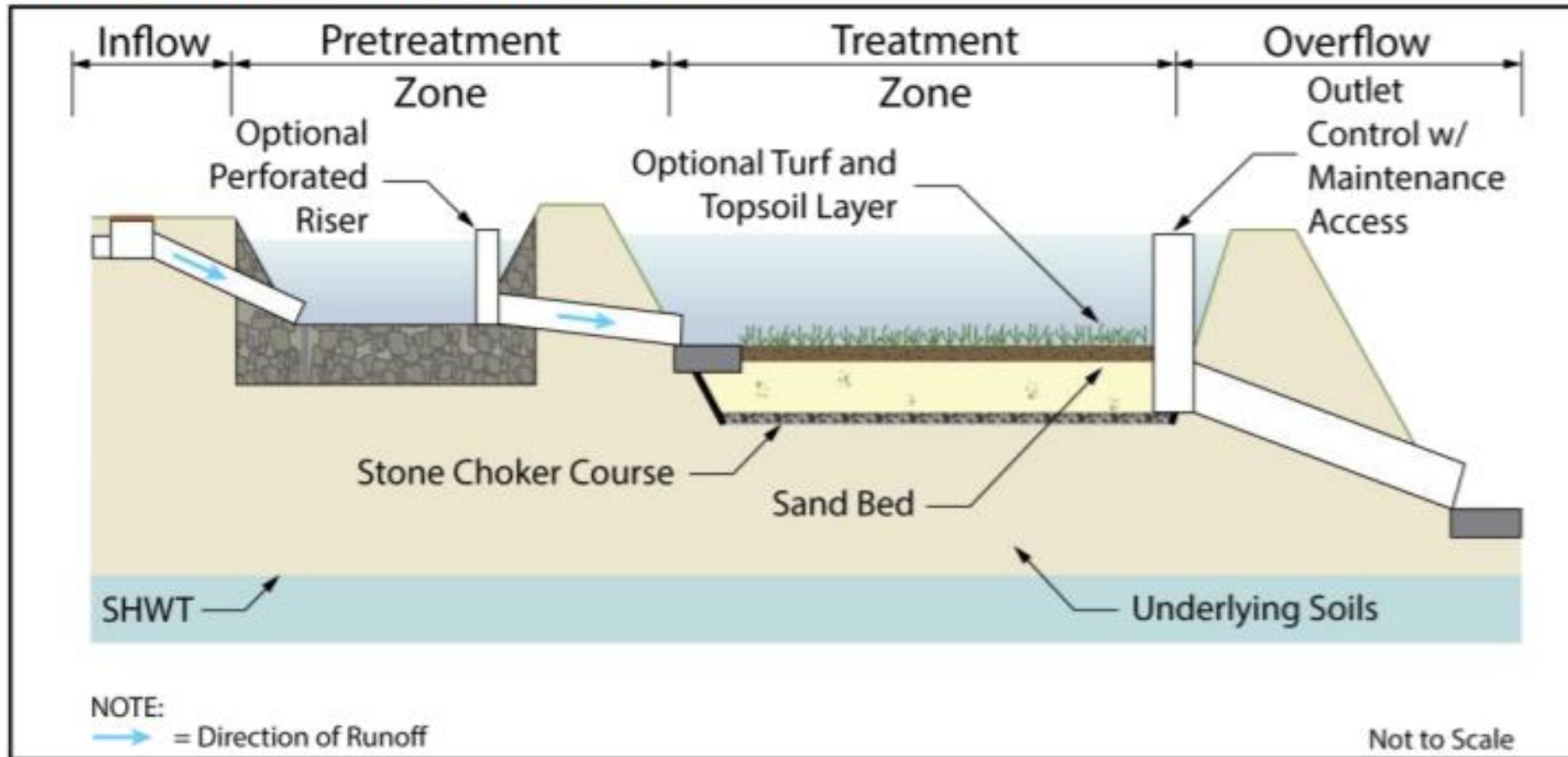


Infiltration – Extended Detention Basin: Profile View

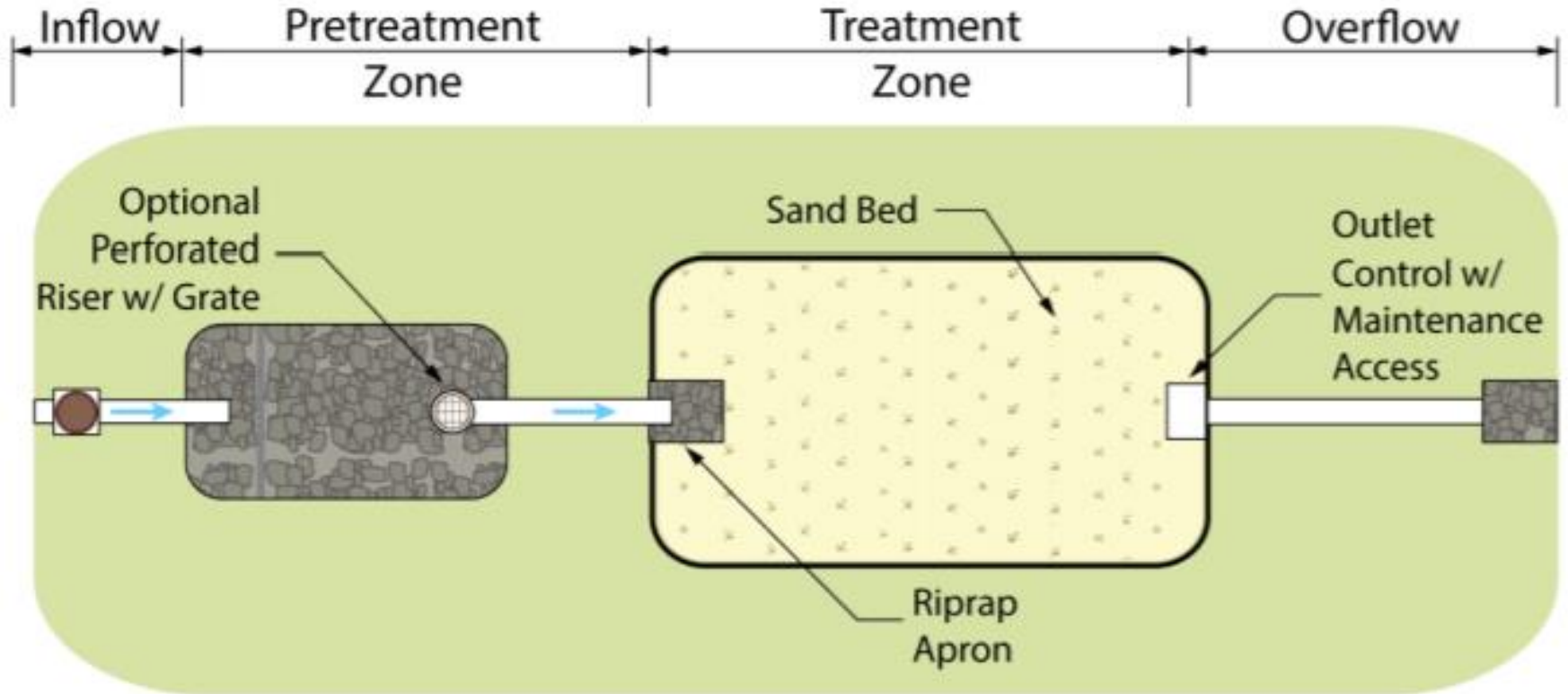


Small-Scale Sand Filter

Profile View – Sand Filter Basics



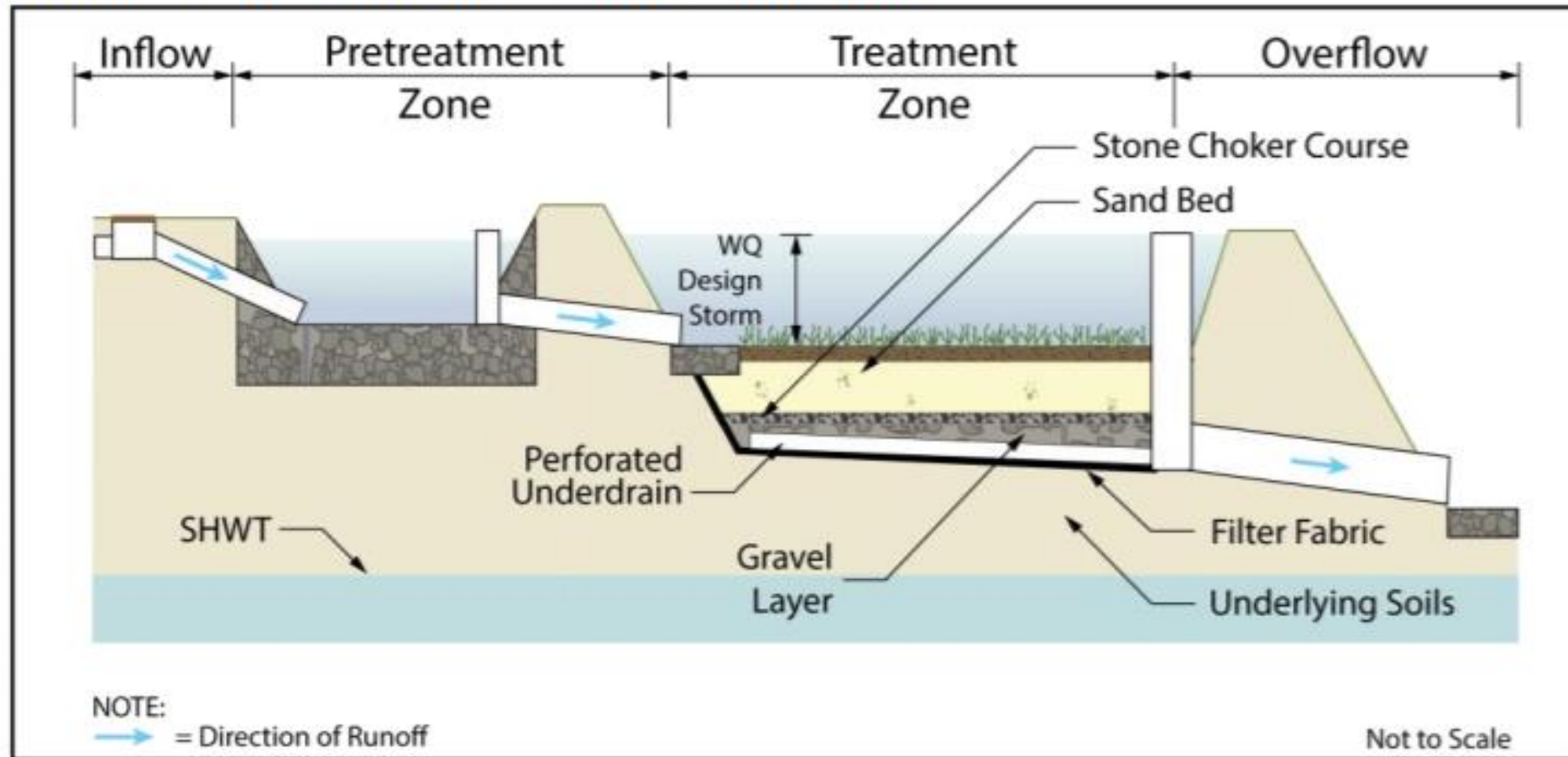
Plan View – Sand Filter Basics



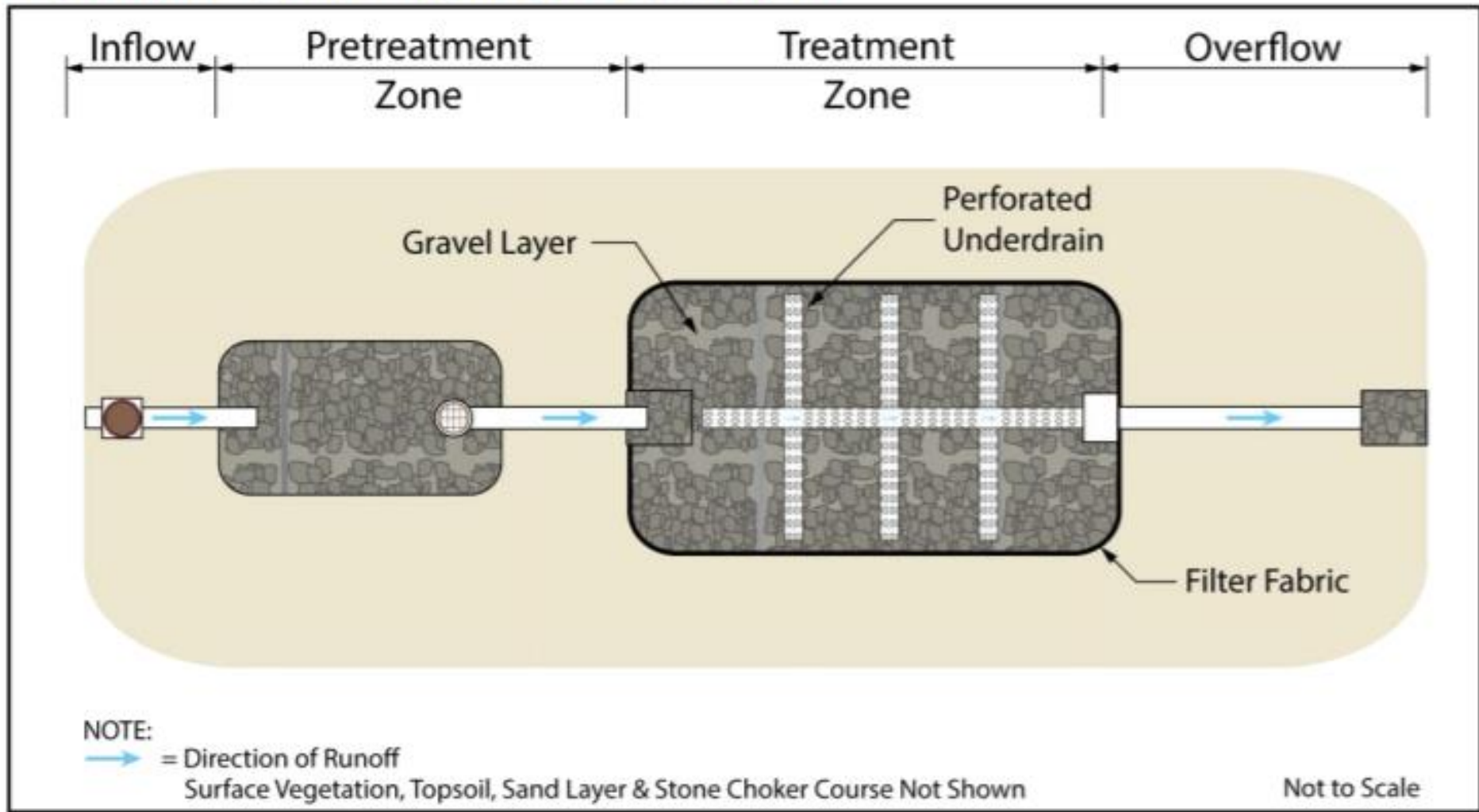
NOTE:
→ = Direction of Runoff

Not to Scale

Profile View – Sand Filter with Underdrain



Plan View – Sand Filter with Underdrain

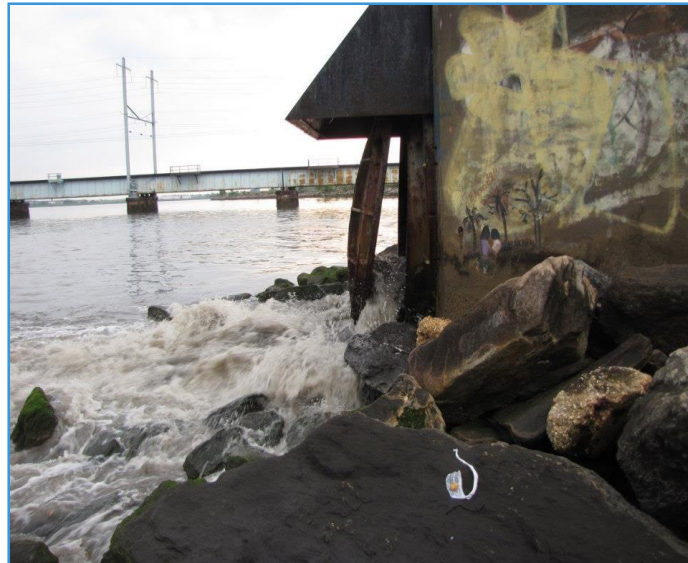
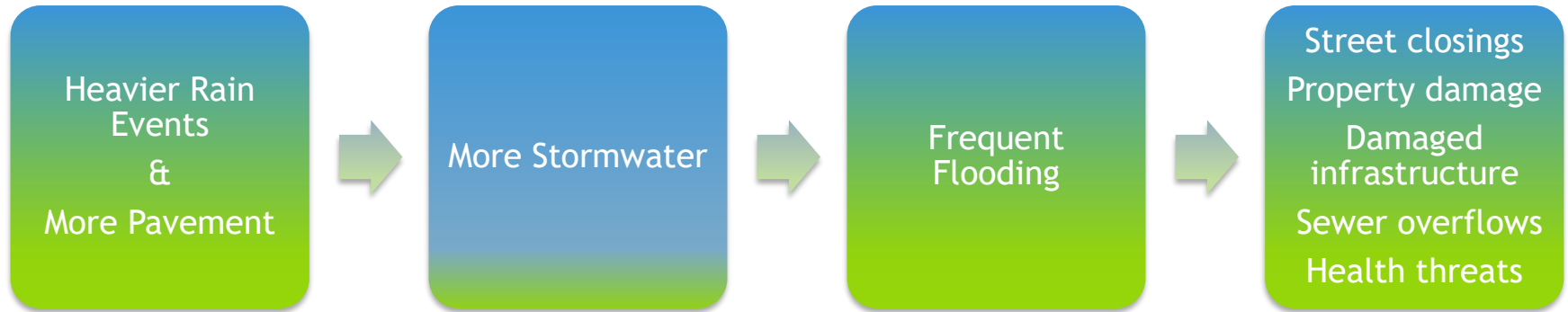


Mainstreaming Stormwater Management Using Structural and Non-Structural (Green Infrastructure) Systems

Van Leer Chocolate Factory Redevelopment

By George Vallone - President and
Co-Founder Hoboken Brownstone Company

A Growing Problem



A Tool: Green Infrastructure

- ▶ Uses or mimics natural systems to manage stormwater and snowmelt.
- ▶ Enables water to filter into the ground near where it falls, or captures it for re-use.
- ▶ Examples: street trees, permeable pavement, rain gardens, vegetated swales, rain barrels, green roofs, rainwater cisterns.



Triple Bottom Line Benefits of Green Infrastructure

Environmental

- Cleans and conserves water, improves air quality, saves energy, restores ecosystems

Social/Public Health

- Helps prevent flooding, supports walkable communities, reduces “heat island” effect, promotes outdoor recreation and community gardens, benefits mental health

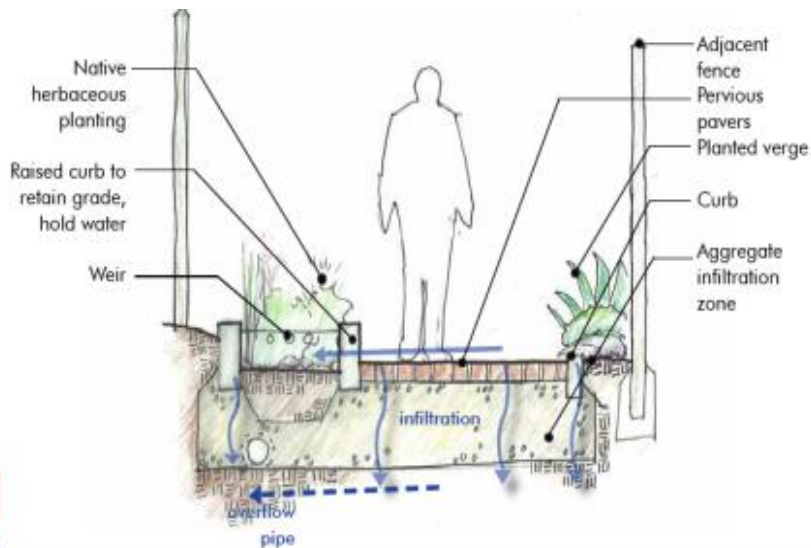
Economic

- Can increase property values and rental premiums, and lower energy costs; often less expensive to maintain; provides jobs that require no prior experience.

Design and Maintenance - Integrative Process



Wharton Street Lofts, Philadelphia, PA, whartonstreetlofts.com



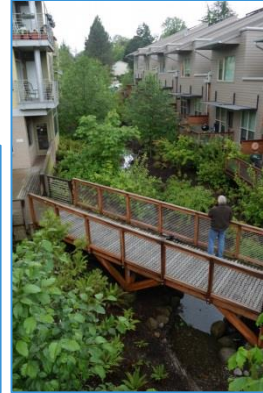
STORMWATER PLANTER GREEN STREETS



Green Infrastructure around the Nation



High Point Neighborhood, Seattle, WA, seattle.gov



Apartment complex at Headwaters at Tyron Creek, Portland, OR
<http://greenworkspc.com>



Homes in Burnsville, MN
<http://burnsville.org>

Van Leer Chocolate Factory

7 Acres in Jersey City

Phase 1: 260 Apartments



Van Leer Chocolate Factory Phase 2 -137 and Phase 3 - 240



Expensive Structural SW System Under-Building Detention Basin



Under-Building Detention Basin- Support Framing for 1st Floor



Stormwater connection to CSO



MTD Manufactured Treatment Device Cleans Water Before CSO



Sidewalk Stormwater Planter



Sidewalk Stormwater Planter



Rain Garden



Pocket Pond Distributed SW Detention



Van Leer Park



Van Leer Park



Van Leer NJ Transit Green Space Easement



Van Leer Park and Future Rail Trail



Zen Garden - Vegetated Cap



Van Leer Park - Vegetated Swale to Stormwater Collection Points

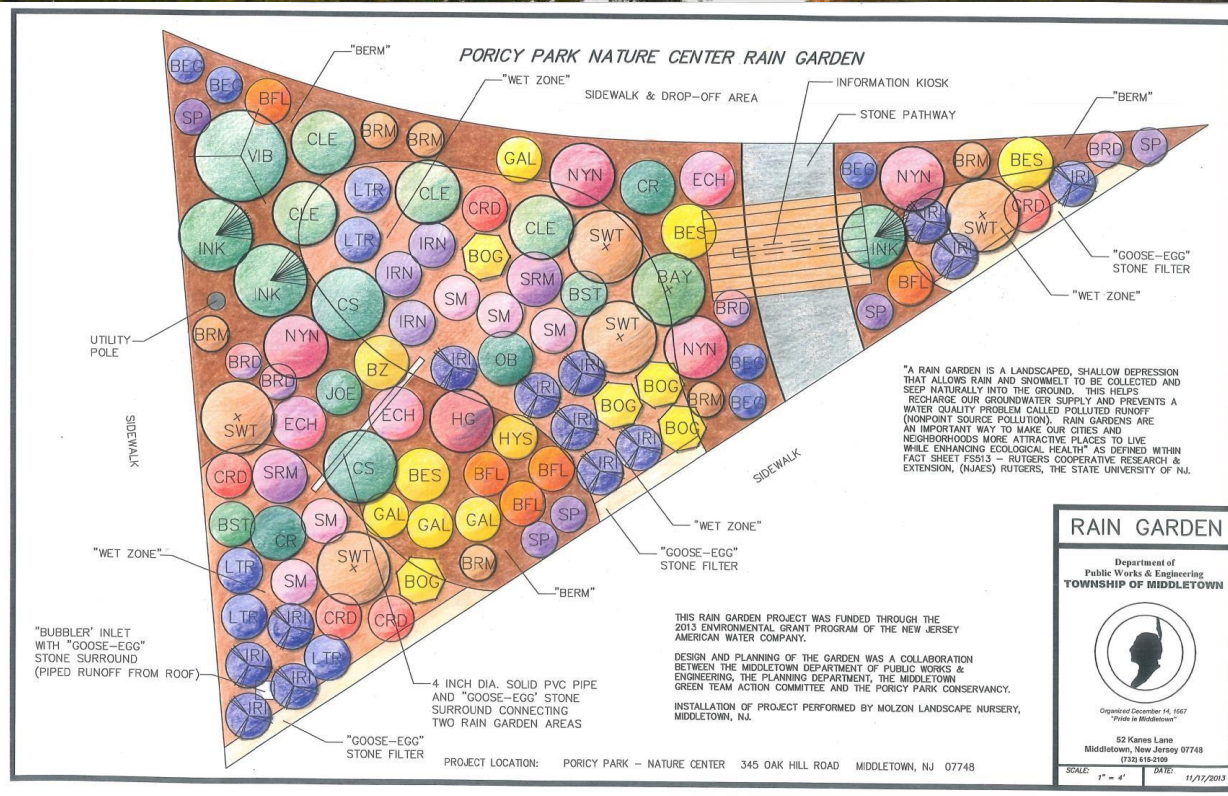


Thank You!

Middletown Township Stormwater Pollution Prevention



Poricy Park Rain Garden



"A RAIN GARDEN IS A LANDSCAPED, SHALLOW DEPRESSION THAT ALLOWS RAIN AND SNOWMELT TO BE COLLECTED AND SEEP NATURALLY INTO THE GROUND. THIS HELPS RECHARGE OUR GROUNDWATER SUPPLY AND PREVENTS A WATER QUALITY PROBLEM CALLED POLLUTED RUNOFF (NONPOINT SOURCE POLLUTION). RAIN GARDENS ARE AN IMPORTANT WAY TO MAKE OUR CITIES AND NEIGHBORHOODS MORE ATTRACTIVE PLACES TO LIVE WHILE ENHANCING ECOLOGICAL HEALTH"

- AS DEFINED WITHIN
FACT SHEET FS513 - RUTGERS
COOPERATIVE RESEARCH &
EXTENSION, (NJAES) RUTGERS, THE
STATE UNIVERSITY OF NJ.

Poricy Park Conservancy Green Roof Pavilion





Poricy Park Conservancy Green Roof Pavilion

(Township Announces GRP)

Middletown Constructs Green Pavilion at Poricy Park!

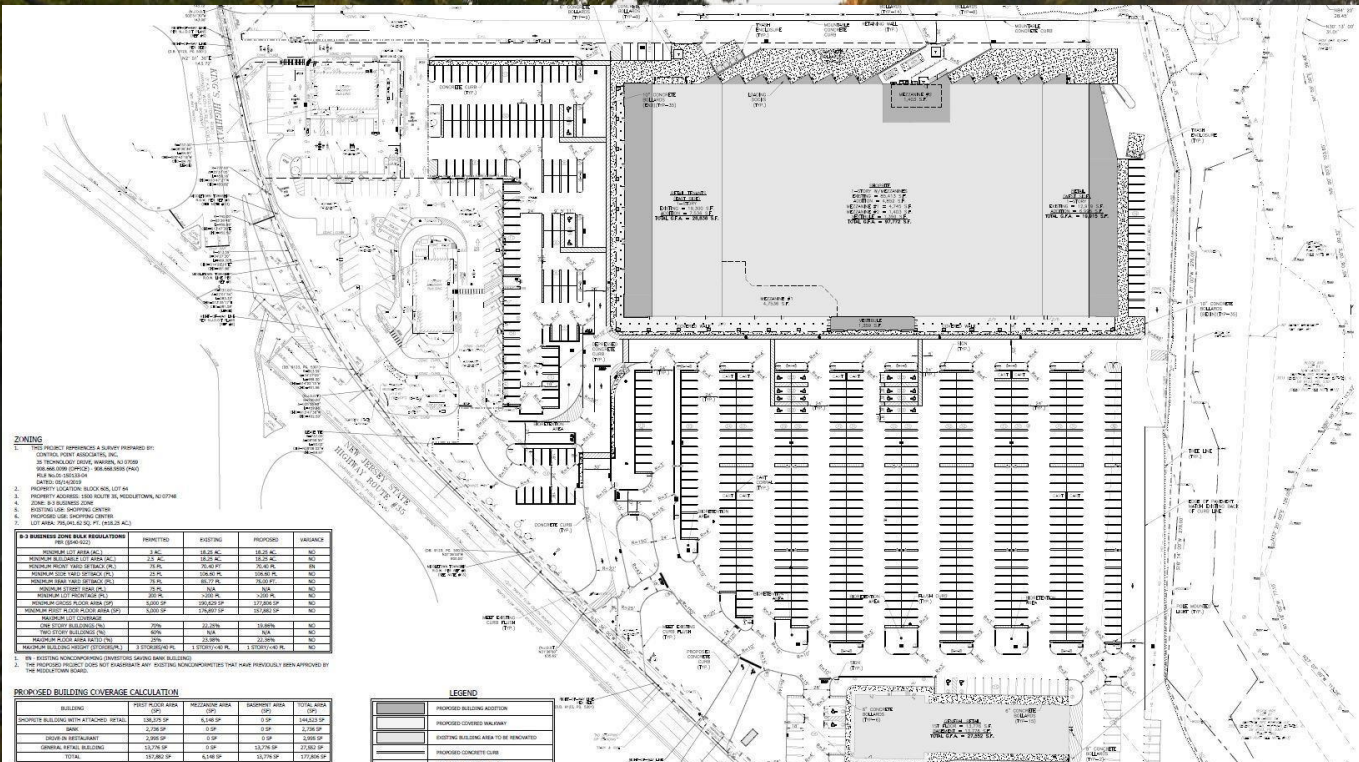
The Township recently cut the ribbon for the Green Pavilion located at Poricy Park. We look forward to using the pavilion's living roof and learning kiosk as an outdoor classroom for Poricy Park Nature Center programs and as a sustainability education tool for the community to learn about green roof infrastructure. The pavilion was partially funded by a \$20K Sustainable Jersey grant, a private donation made to the Poricy Park Conservancy from the Ellis Family as well as Township monies.



Bio Retention Basins in New Development



Currently the Sears parking lot is completely paved. There is no existing Stormwater system on site. There are enhancements being proposed to bring the outdated site up to current standards as far as it is practicable. With the proposed improvements, the development will provide landscape islands, bioretention basins along the end of the parking isles.



Site plan of a parking lot with various features and annotations. The plan shows a large rectangular parking area with several rows of parking spaces. Key features include:

- Proposed Concrete Curb (Typ.):** Indicated by a dashed line along the perimeter and internal divisions.
- Bioretention Area:** Four rectangular areas are marked with a cross-hatch pattern and labeled "BIORETENTION AREA".
- Flush Curb (Typ.):** A small rectangular feature labeled "FLUSH CURB (TYP.)".
- Sign (Typ.):** Several rectangular signs are marked with a cross-hatch pattern and labeled "SIGN (TYP.)".
- Cart Corral (Typ.):** A rectangular area labeled "CART CORRAL (TYP.)".
- Radius Callouts:** Numerous circular and arc radii are labeled, such as R=10', R=15', R=20', R=25', R=30', R=45', R=150', and R=22'.
- Other Labels:** "MEET EXISTING CURB FLUSH (TYP.)", "PROPOSED CONCRETE CURB (TYP.)", "STOP", "NEW JERSEY", "SIB 14' 00\" W 275.00'", and "POL LIG".

Red circles and lines are drawn over the plan, highlighting specific areas and features, including the bioretention areas, flush curb, and sign locations.