



Annual Inspection Report Guidelines for Stormwater Control Measures

Most Common Stormwater Control Measures (SCMs)

Select your SCM(s) below to learn more.

- **Detention (dry) & Retention (wet) Ponds**
(Quantity Credits)
- **Dry & Wet Extended Detention Ponds**
(Quantity & Quality Credits)
- **Underground Detention Systems**
(Quantity and/or Quality Credits)
- **Bioretention Cells** (Quality Credits)
- **Porous/Permeable Pavement** (Quantity and/or Quality, and Reduction in Impervious Surface Credits)

Detention & Retention Ponds

(Quantity Credit)

*Find the full maintenance manual at
<https://www.neorsd.org/scm>*

Description for this SCM: Page #9

Maintenance plan for this SCM: Page #33

Inspection checklist/form: Appendix 2, page 49

Examples of Detention Ponds



Detention Pond Design Features

- Completely drains between rain events
- Inlets: pipes and open swales
- Main pool/storage volume area
- Outlet structure and orifices (typically 2-stage)
- Emergency spillway & outlet pipe

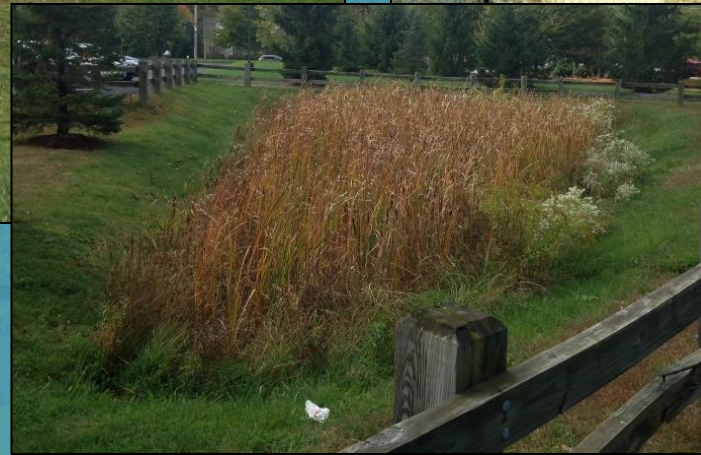


Ensure inlet pipes and open swales are structurally intact and free of any obstructions.

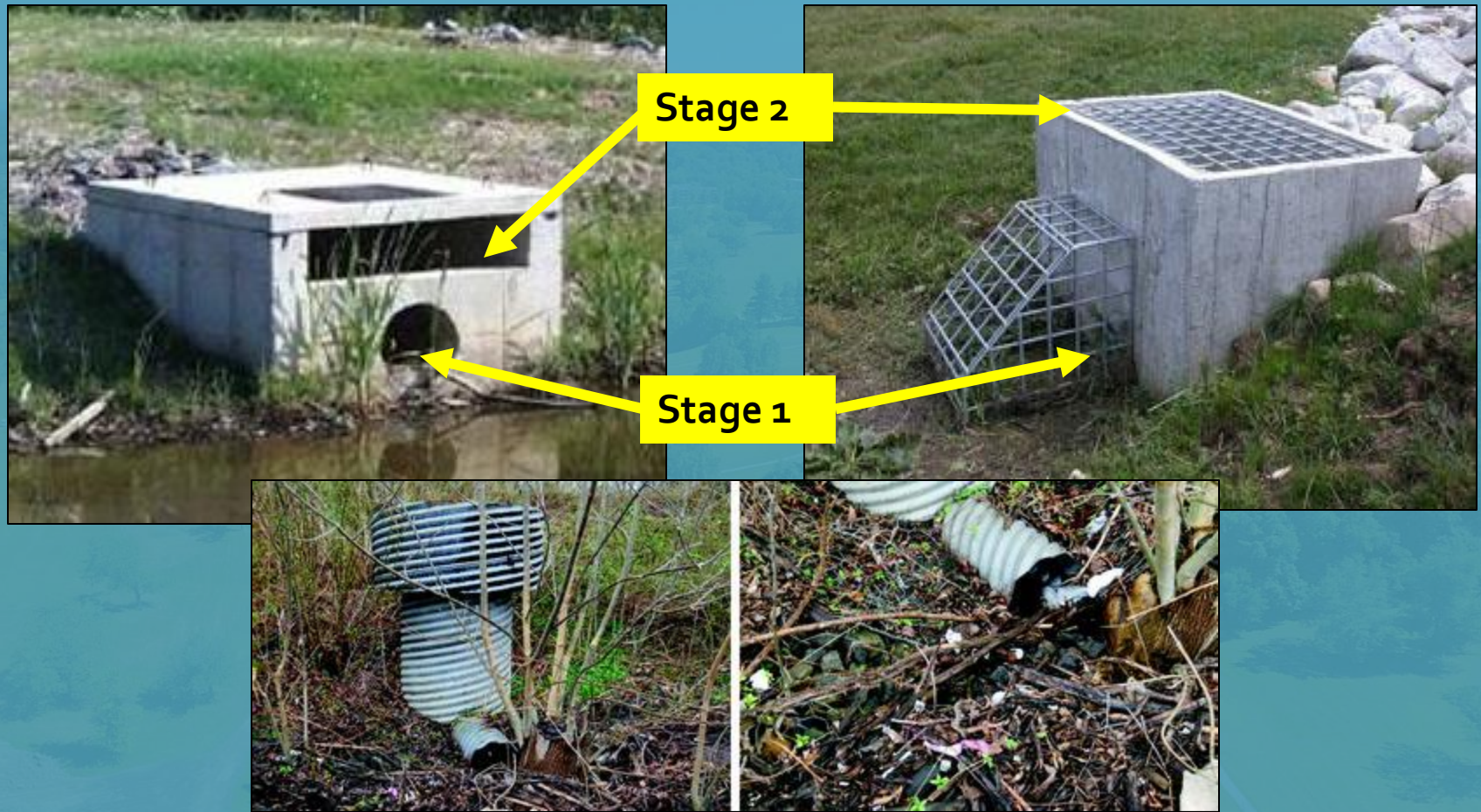
Vegetation is managed primarily for aesthetic reasons.



This basin may need to be dredged to remove accumulated sediments.



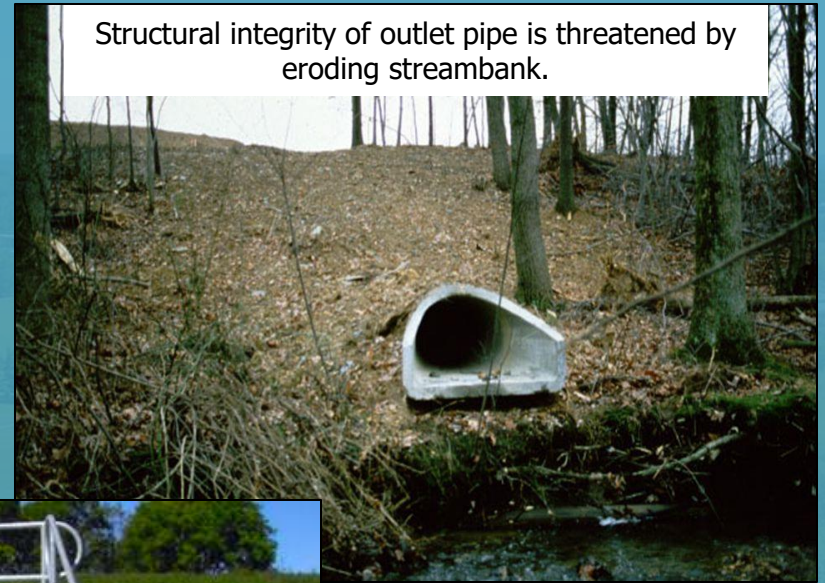
Ensure the main pool and storage volume is not filled with excessive accumulations of sediment. Vegetative growth within the basin is generally not a problem, although it can serve as a breeding ground for mosquitos.



Ensure the outlet structure (typically 2 stages) is structurally intact & the orifices are free of blockages. Remove vegetative growth in the immediate area of the orifices.



Emergency spillway (often made of stone or grass-lined)



Structural integrity of outlet pipe is threatened by eroding streambank.



Ensure the emergency spillway & outlet pipe are structurally intact and free of blockages.

Examples of Retention Ponds

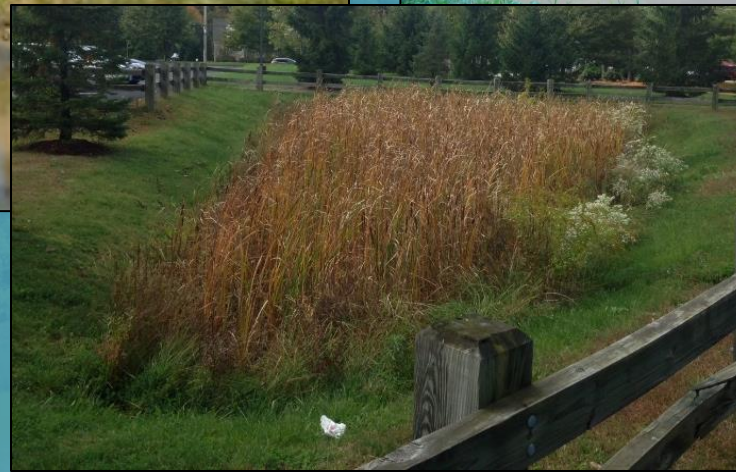


Retention Pond Design Features

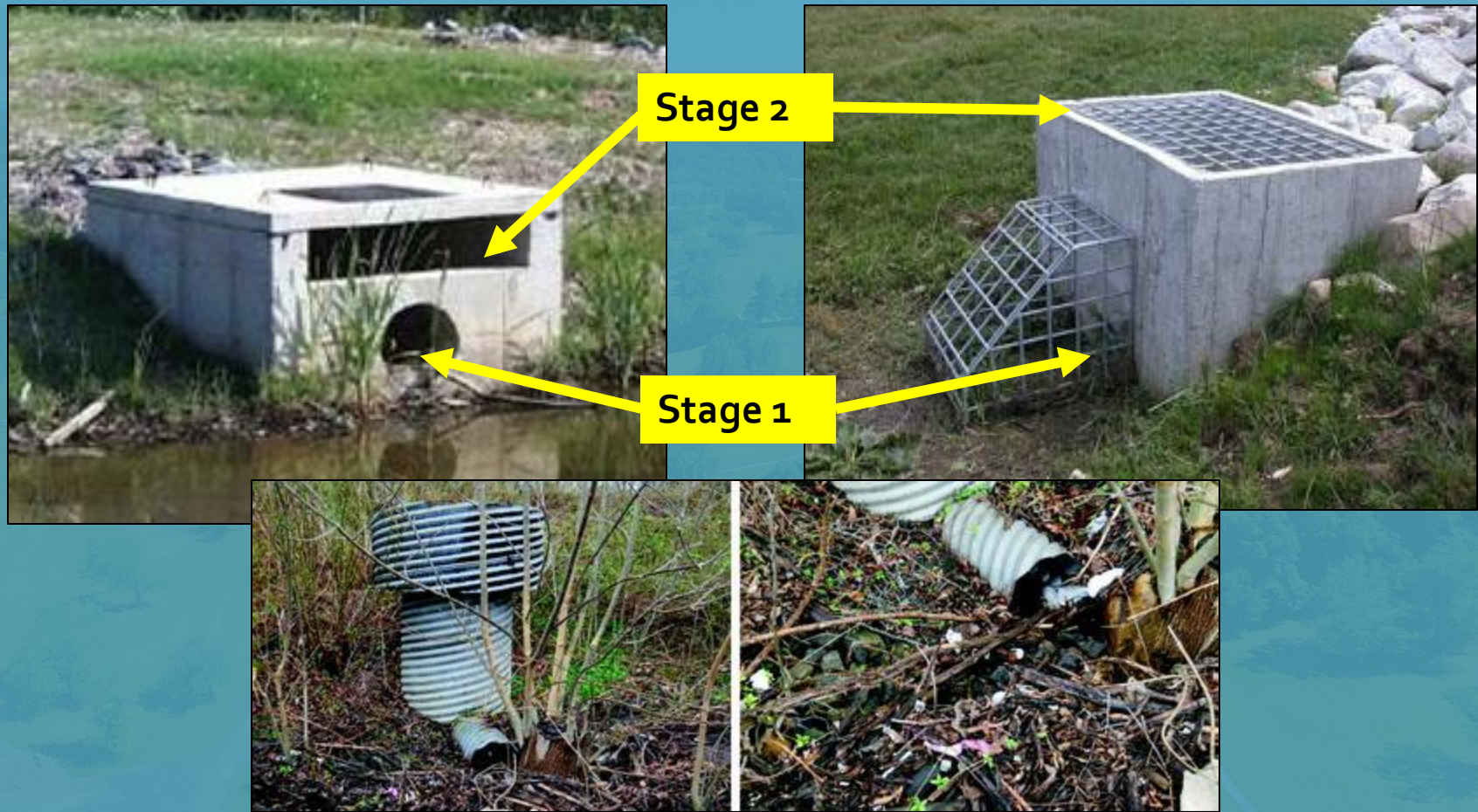
- The water level fluctuates during significant rain events, but a permanent pool remains
- Inlets: pipes and open swales
- Main pool/storage volume area
- Outlet structure and orifices (typically 2-stage)
- Emergency spillway & outlet pipe



Ensure inlet pipes and open swales are structurally intact and free of any obstructions.



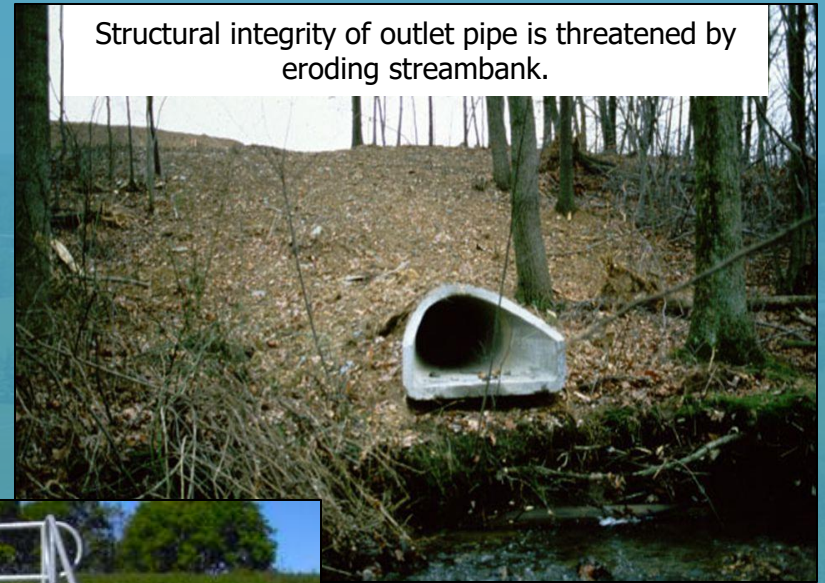
Ensure the main pool and storage volume is not filled with excessive accumulations of sediment. Dredging is warranted when islands begin to form above the normal waterline. Vegetative growth within the basin is generally not a problem, although it can serve as a breeding ground for mosquitos.



Ensure the outlet structure (typically 2 stages) is structurally intact & the orifices are free of blockages. Remove vegetative growth in the immediate area of the orifices.



Emergency spillway (often made of stone or grass-lined)



Structural integrity of outlet pipe is threatened by eroding streambank.



Ensure the emergency spillway & outlet pipe are structurally intact and free of blockages.

Dry & Wet Extended Detention Ponds

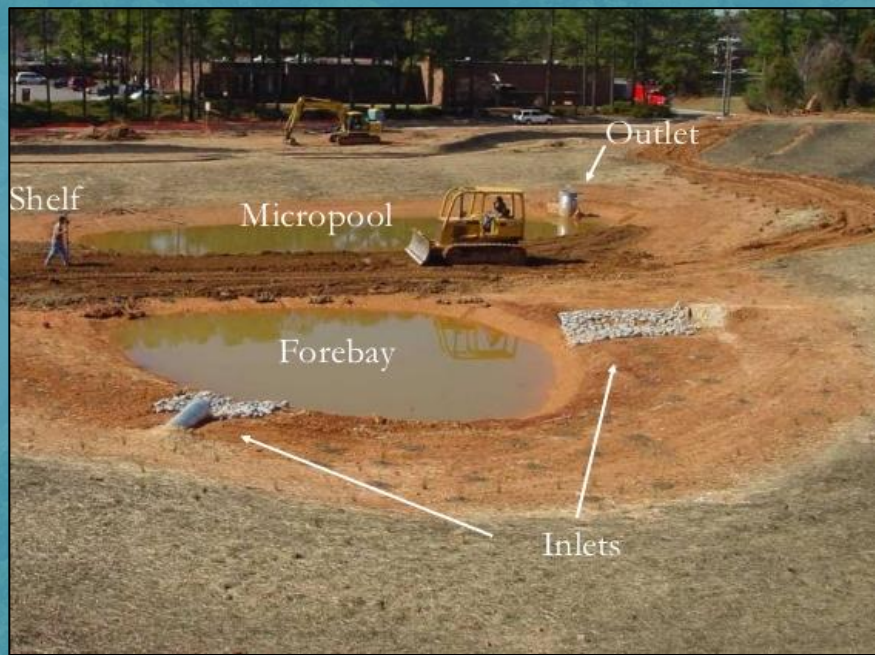
*Find the full maintenance manual at
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Examples of Dry Extended Detention Ponds

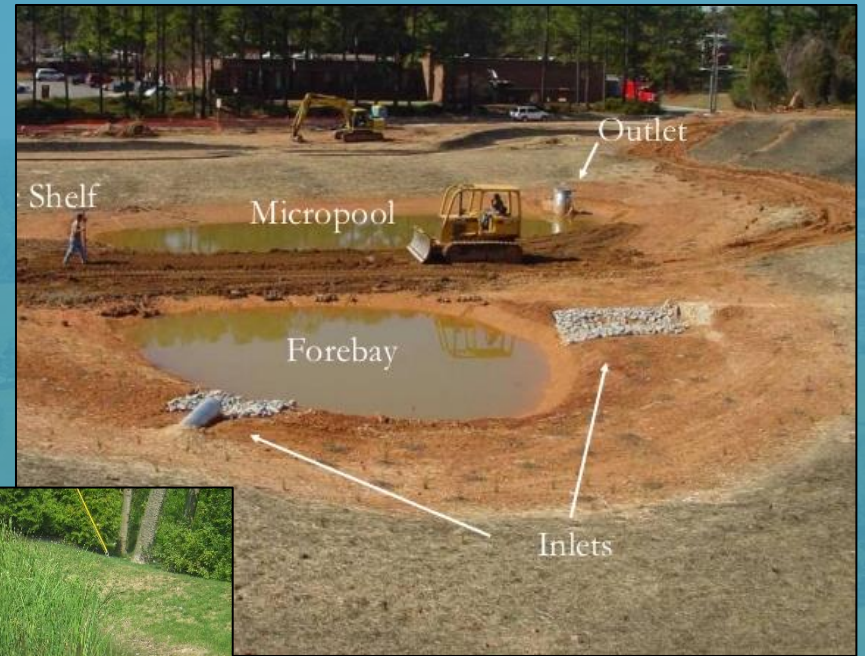


Dry Extended Detention Pond Design Features

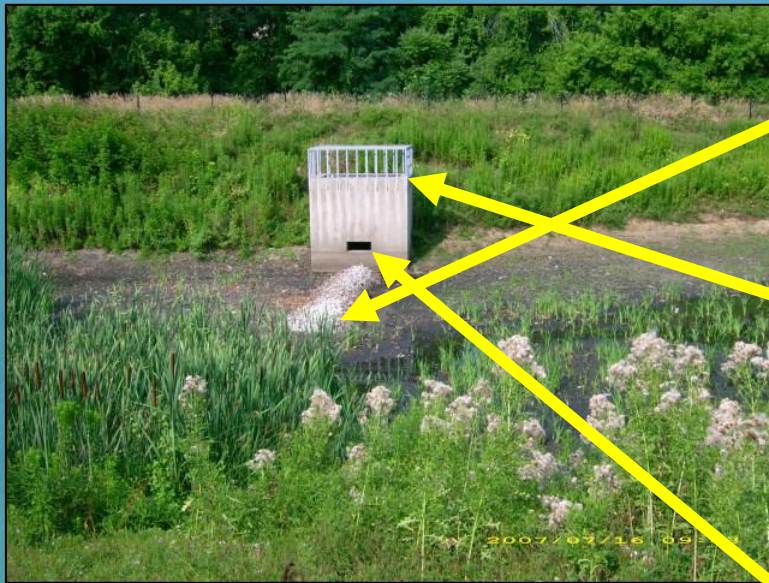
- Completely drains between rain events, but often have a forebay at the base of each inlet and a micropool at the outlet, both of which have a permanent pool of water.
- Inlets: pipes and open swales
- Forebays and micropools
- Outlet structure and orifices (typically 3-stage)
- Emergency spillway & outlet pipe



Ensure inlet pipes and open swales are structurally intact and free of any obstructions.



Ensure the forebay(s) and the micropool are not filled with excessive accumulations of sediment. Vegetative growth within the basin is generally not a problem, although it can serve as a breeding ground for mosquitos.



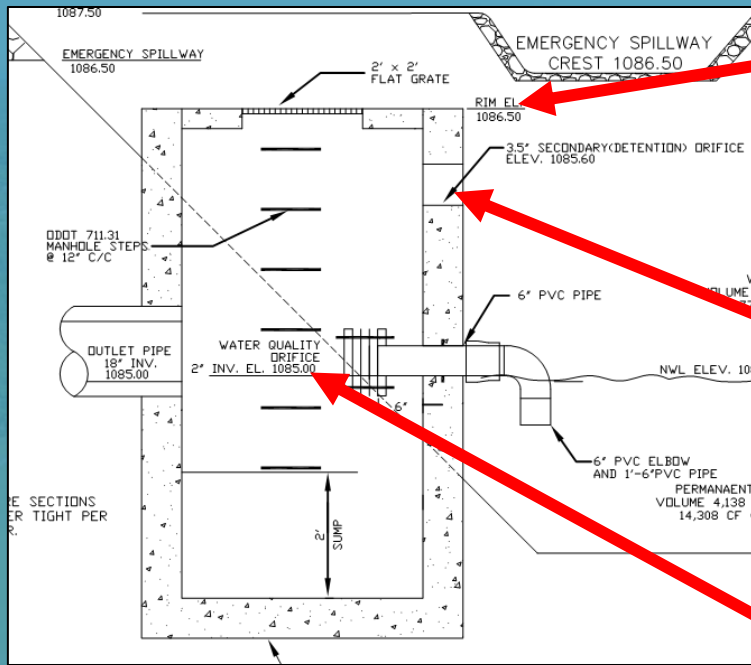
Stage 1

Stage 3

Stage 2



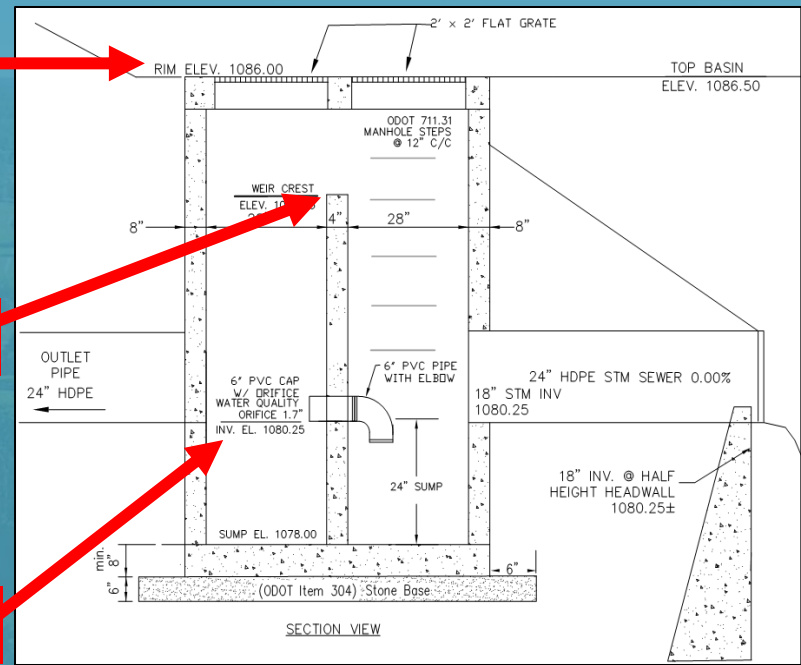
Ensure the outlet structure (typically 3 stages) is structurally intact & the orifices are free of blockages. Remove vegetative growth in the immediate area of the orifices. The Stage 1 orifice is typically less than 3-inches in diameter and is usually fitted with an anti-clog device. It is often found on the inside of the outlet structure.



Stage 3

Stage 2

Stage 1



These details show commonly utilized outlet structures for dry and wet extended detention basins, including the anti-clog mechanism for the smallest orifice (Stage 1...a 6-inch pipe with smaller hole drilled into cap). The right side detail shows the setup for an interior weir wall.

Common setup outside the outlet structure
(gravel covering a perforated pipe)



Common setup inside the outlet structure
(stage 1 orifice is drilled into the cap on a pipe)



A "hood" protects the small (<3") stage 1 orifice
from getting clogged with floating debris



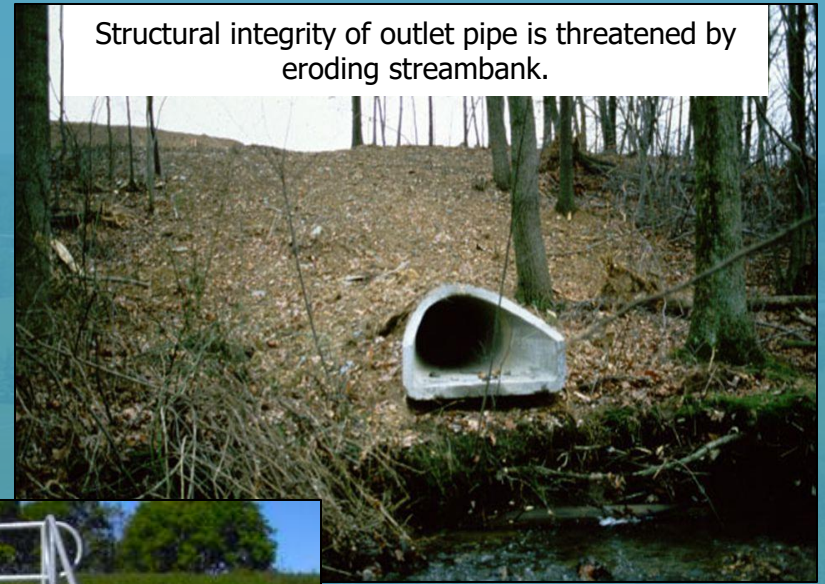
A downturned elbow prevents floating debris from
blocking the stage 1 orifice



Examples of anti-clog devices protecting the stage 1 orifice.



Emergency spillway (often made of stone or grass-lined)



Structural integrity of outlet pipe is threatened by eroding streambank.



Ensure the emergency spillway & outlet pipe are structurally intact and free of blockages.

Examples of Wet Extended Detention Ponds

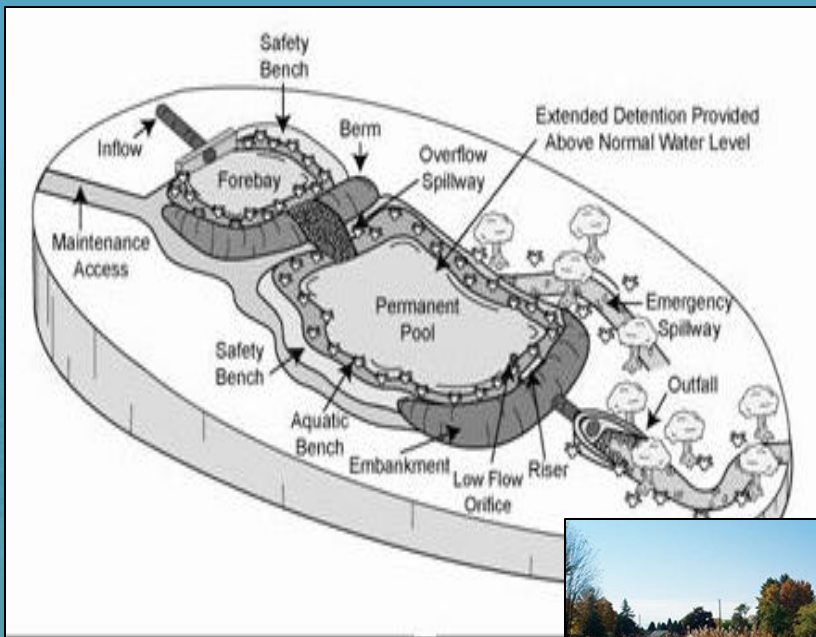


Wet Extended Detention Pond Design Features

- The water level fluctuates during significant rain events, but a permanent pool remains. An optional forebay may be located at the base of each inlet pipe.
- Inlets: pipes and open swales
- Main pool/storage volume area
- Outlet structure and orifices (typically 3-stage)
- Emergency spillway & outlet pipe



Ensure inlet pipes and open swales are structurally intact and free of any obstructions.



Ensure the forebays are not filled with excessive accumulations of sediment. Vegetative growth within the basin is generally not a problem.



Stage 3

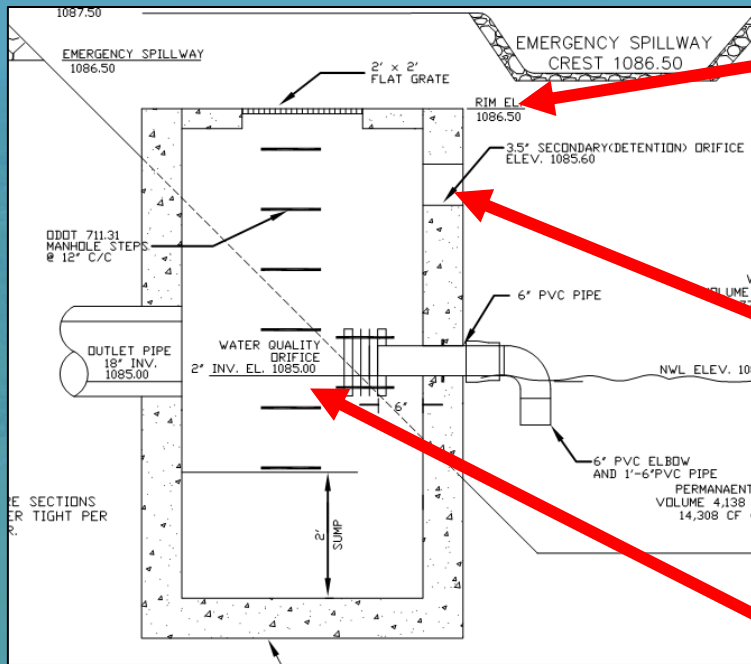
Stage 2

Stage 1



Ensure the outlet structure (typically 3 stages, but not always) is structurally intact & the orifices are free of blockages. Remove vegetative growth in the immediate area of the orifices.

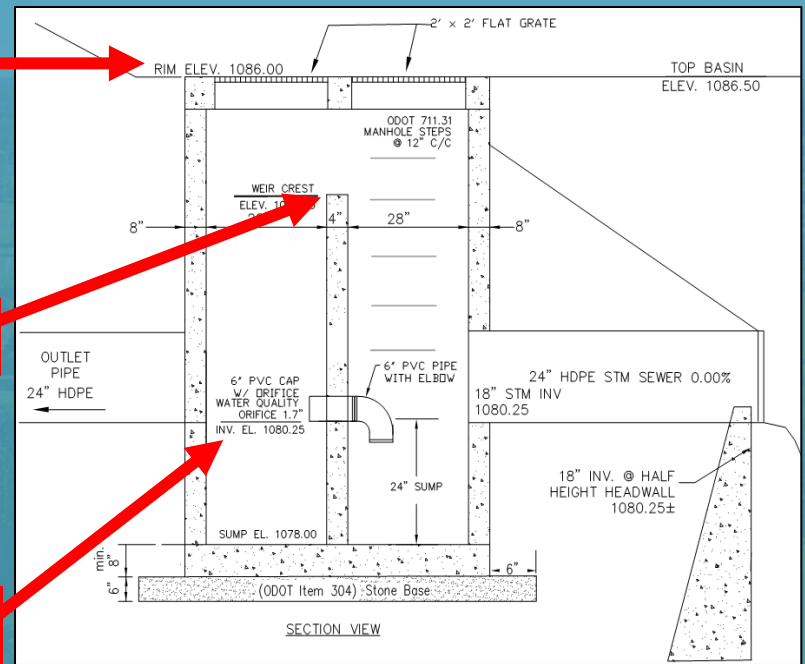
The Stage 1 orifice is typically less than 3-inches in diameter and is usually fitted with an anti-clog device. It is often found on the inside of the outlet structure.



Stage 3

Stage 2

Stage 1



These details show commonly utilized outlet structures for dry and wet extended detention basins, including the anti-clog mechanism for the smallest orifice (i.e., Stage 1...a 6-inch pipe with smaller hole drilled into cap). The right side detail shows the setup for an interior weir wall.

Common setup outside the outlet structure
(gravel covering a perforated pipe)



Common setup inside the outlet structure
(stage 1 orifice is drilled into the cap on a pipe)



A "hood" protects the small (<3") stage 1 orifice
from getting clogged with floating debris



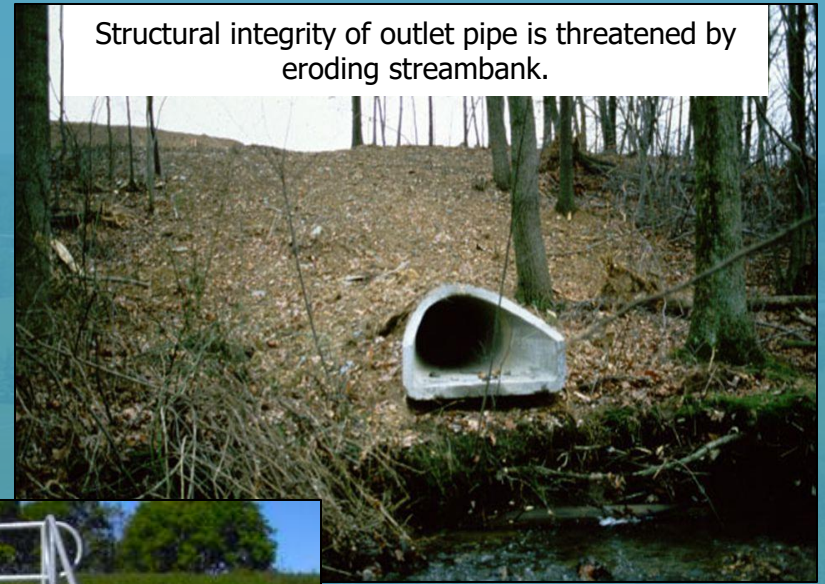
A downturned elbow prevents floating debris from
blocking the stage 1 orifice



Examples of anti-clog devices protecting the stage 1 orifice.



Emergency spillway (often made of stone or grass-lined)



Structural integrity of outlet pipe is threatened by eroding streambank.



Ensure the emergency spillway & outlet pipe are structurally intact and free of blockages.

Underground Detention Systems

*Find the full maintenance manual at
<https://www.neorsd.org/scm>*

Description for this SCM: Page #27

Maintenance plan for this SCM: Page #39

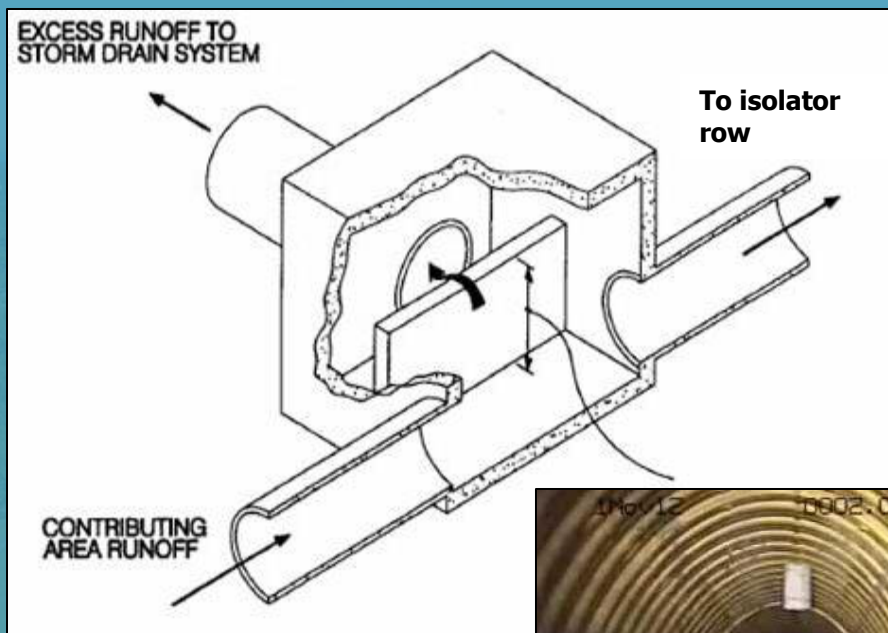
Inspection checklist/form: Appendix 2, page 49

Examples of Underground Detention Systems



Underground Detention Design Features

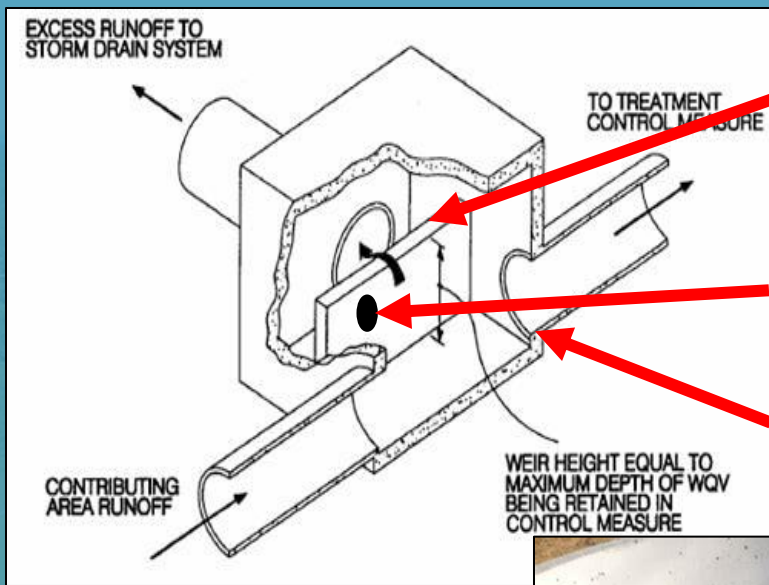
- Isolator row with diverter (optional)
- Main pool/storage volume area (chambers or pipes)
- Outlet structure and orifices (typically multi-stage)



Runoff can first enter an isolator row (if present), which is a portion of the system completely wrapped in filter fabric. It is designed to capture the bulk of sediments entering the system. A weir wall typically diverts flow into the isolator row. Ensure the weir wall is structurally sound and that accumulated sediments are removed on a regular basis.



Ensure the isolator row (if present), chambers and storage volume are not filled with excessive accumulations of sediment.



Stage 3

Stage 2

Stage 1



Ensure the outlet structure (typically multi-stage) is structurally intact & any orifices on the weir wall are free of blockages.

Bioretention Cells

*Find the full maintenance manual at
<https://www.neorsd.org/scm>*

Description for this SCM: Page #7

Maintenance plan for this SCM: Page #32

Inspection checklist/form: Appendix 2, page 49

Examples of Bioretention Cells



Bioretention Cell Design Features

- Pre-treatment (optional)
- Inlets: pipes and open swales
- Planting/infiltration bed (main storage volume area)
- Overflow/outlet structure and underdrains

A grass filter



A gravel verge is often used with curb cuts.



Catch basin inserts are often used on storm sewers that discharge directly into a bioretention cell.

Ensure the pre-treatment design feature is structurally intact and not clogged with sediment.



Ensure there is no erosion occurring at the base of inlets (curb cuts and storm sewers).



The planting/infiltration bed: ensure the mulch layer is replenished as needed (maintain a 2-3 inch layer), and ensure dead, dying or diseased plants are removed to allow healthy plants to thrive.



Note the eroding in-flow channel, which can clog the bed with sediment.



The planting/infiltration bed: standing water 24-hours after the rain has stopped is an indication the top layer of soil needs to be removed and replaced (clogged from accumulation of sediments).



The joint in this outlet was not properly sealed. This greatly reduces the storage volume.



Perforated underdrains installed during the construction of a bioretention cell.



Cleanout ports (if present) should extend above the mulch and have a solid removable cap.

Ensure overflow structure outlet joints are properly sealed and free of blockages. Also ensure the underdrains, including cleanout ports, are free of any blockages.

Porous/Permeable Pavement

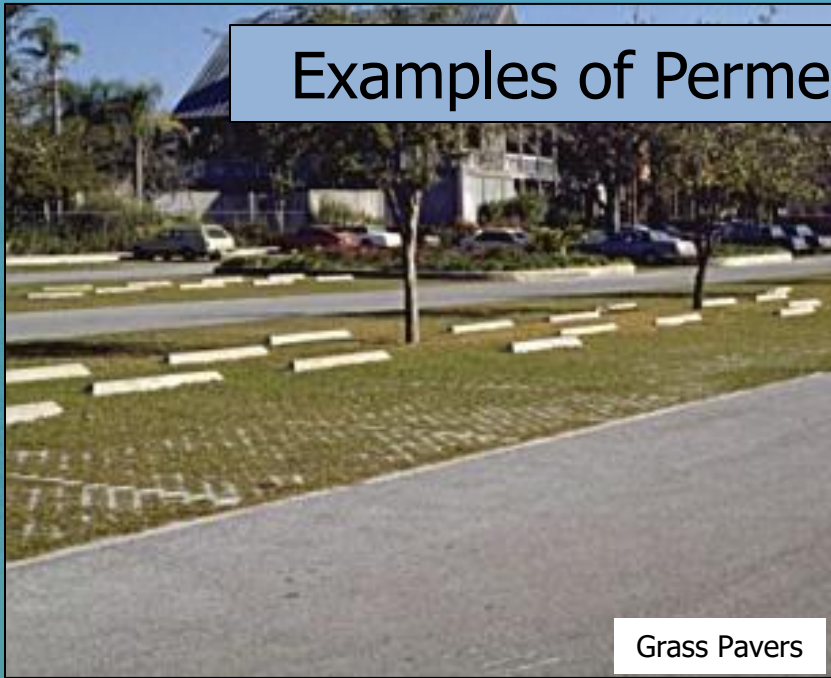
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Description for this SCM: Page #15

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Examples of Permeable Pavement Systems



Grass Pavers



Permeable Pavers



Porous Asphalt

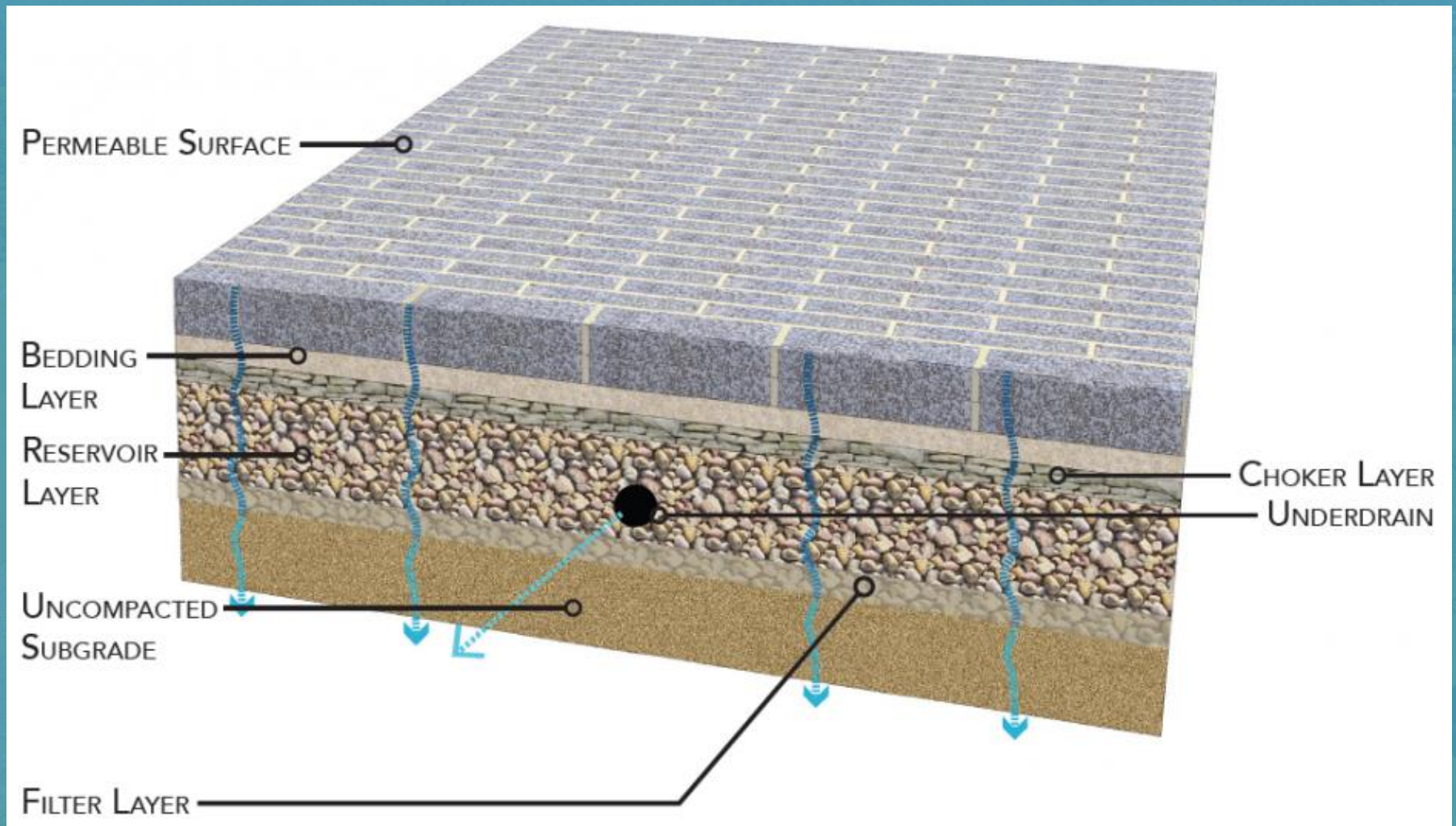


Porous Concrete

Porous/Permeable Pavement Design Features

- Permeable surface (e.g., concrete, asphalt, pavers, etc.)
- Bedding layer (typically pea gravel)
- Choker layer (commonly comprised of driveway gravel)
- Reservoir layer (comprised of larger stone, with or without underdrains)

Porous/Permeable Pavement Cross-Section



Permeable pavers clogged with sediment

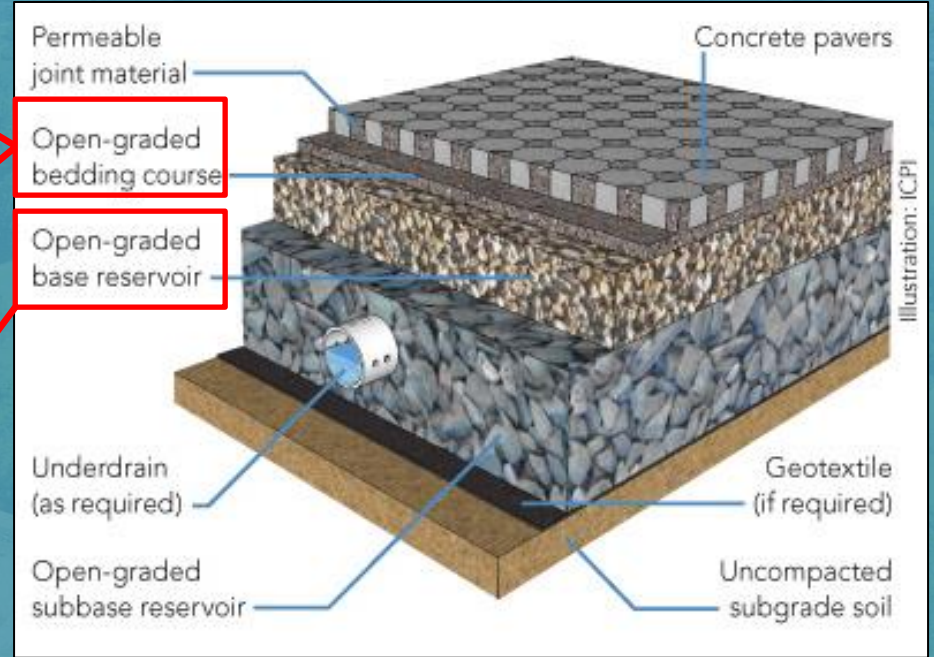


The surface of porous concrete and porous asphalt must be kept clean.

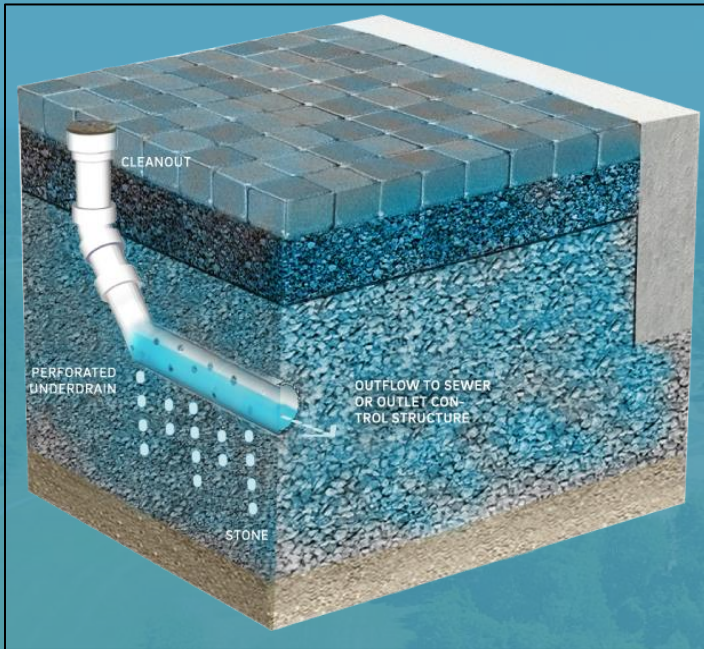


Joints between paver blocks must be kept clean.

Ensure the top permeable surface is kept clean throughout the year to prevent clogging of the pores on concrete & asphalt, or the gaps between paver blocks.



Although not visible on a completed project, the bedding layer and/or the choker layer (“open-graded base reservoir”) can become clogged with sediments as well.



Ensure the underdrains (if present) are free of any blockages. Underdrains typically terminate at a storm drain catch basin, where they can be observed. Observation ports (cleanouts) may be present to monitor water levels on systems that are designed to infiltrate water into the underlying soils.