

NOTICE
Illinois Urban Manual (IUM)
Standard Update

**U.S. ARMY
CORPS OF ENGINEERS
CHICAGO DISTRICT**

**ILLINOIS URBAN MANUAL
STANDARD NUMBER:**

**ILLINOIS URBAN MANUAL
PRACTICE STANDARDS**

**Dry Detention Basin Code 809
Extended Detention Basin Code 810
Wet Bottom Detention Basin Code 811
Wetland Detention Basin Code 812**

**COMMENT PERIOD BEGINS: March 17, 2026
COMMENT PERIOD EXPIRES: April 17, 2026**

The above-referenced IUM practice standards are currently utilized for sediment control on construction/development sites. Each referenced standard and associated drawing (attached) is being updated by the IUM Technical Review Committee (TRC). The TRC is comprised of representatives of various regulatory agencies, consultants, developers, and other stakeholders. The Illinois Urban Manual is the primary technical manual for Erosion and Sediment Control in the State of Illinois. The practice standards must be updated due to advances in product development and associated operation and maintenance practices.

The Corps of Engineers and the IUM Technical Review Committee are requesting comments from erosion and sediment control professionals, developers, engineers, contractors, and other interested parties on the enclosed standards. The comments are reviewed by the Technical Review Committee prior to the finalization of an IUM update. The approved standard will be incorporated into the Illinois Urban Manual immediately upon approval by the IUM Steering Committee, and the Illinois Environmental Protection Agency.

Interested parties may provide comments on the updated standards in writing no later than **April 17, 2025**. Comments shall be submitted as follows:

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tommy.purdom@kanedupageswcd.org

It should be noted that any comments received on a standard (via hard copy, or electronic) will be accepted with the full name and address of the individual commenting only.

This notification is not a paid advertisement and is for public information only. Issuance of this notification does not imply Corps of Engineers endorsement of the standard as described.

If you have any questions regarding this notification, please contact Kathleen Chernich by telephone at 312 846-5531, or email at kathy.g.chernich@usace.army.mil.

ORIGINAL SIGNED

Kathleen G Chernich
Assistant Chief,
Regulatory Branch

ILLINOIS URBAN MANUAL PRACTICE STANDARD

Dry Detention Basin

(feet)

Code 809



Source: DuPage County Stormwater Management

Definition

A dry detention basin is a vegetated basin designed to detain stormwater runoff and slowly release the water over a period of time. The basin is designed to completely drain over a relatively short period of time and does not maintain a permanent pool.

Purpose

The primary purpose for a dry detention basin is to attenuate peak stormwater flows. They are designed to reduce downstream scour and loss of aquatic habitat by reducing the peak flow rate and energy of stormwater discharges.

Conditions Where Practice Applies

This practice applies where the following or similar conditions exist:

1. Where downstream property would be subject to increased flooding without attenuation of flow rate for major storm events;
2. Where the downstream watercourse is not experiencing significant scour and loss of aquatic habitat;

3. Basin site is located in a permanent, post-construction area;
4. Site conditions allow the detention basin to be configured so the inlet(s) are as far away from the outlet structure as possible;
5. Basin is located in an area that allows frequent inspection and ease of maintenance;
6. Drainage area is between 5 and 50 acres;
7. Where structural failure of the detention basin will not result in loss of life, damage to homes, commercial or industrial buildings, main highways or railroads; or in the use or service of public utilities;
8. Basin is not located over utility lines;
9. Basin bottom does not intersect the groundwater table;
10. Basin is not located over a septic field;
11. Basin is not located over an area of karst topography; and
12. Basin is not constructed on streams, or within a delineated wetland area.

Criteria

Construction projects may be subject to local, county, state, and federal rules and regulations.

Dry detention basin design plans and specifications shall be signed and sealed by an Illinois licensed, professional engineer.

Plans and specifications shall be followed by the site superintendent and field personnel during the construction process of the basin.

The basin design shall include the following components:

- 1. Basin Inflow Control Structure**

In addition to culvert headwalls, flared end sections or other inflow treatments, energy dissipaters shall be used to reduce the velocity of incoming stormwater at all inlets. See practices standard [ROCK OUTLET PROTECTION 910.](#)

- 2. Temporary Stormwater Storage**

The temporary storage is located above the surface of the basin bottom.

3. Plantings

The basin surface shall be lined with top soil and vegetated with turf, or native vegetation to help prevent erosion. Trees or shrubs shall not be planted in the basin or embankment footprint.

4. Basin Outlet Control Structure

The structure shall be designed to draw down the temporary storage within a 24-48 hour period at a discharge rate, controlled by an orifice located within the structure, that at a minimum, does not increase over pre-construction conditions for the 100-year frequency, 24-hour duration storm event.

The structure shall be protected by trash racks, grates or other similar devices. Erosion protection shall be installed at the outfalls to further reduce scour. See practices standard [ROCK OUTLET PROTECTION 910.](#)

Outlet structures shall be constructed of reinforced concrete, or other suitable materials.

Outlet structures must be accessible to inspectors, easy to maintain and be resistant to clogging by plant material or debris

5. Emergency Spillway

An emergency spillway shall be included in addition to the outlet control structure. The emergency spillway controls the location of, and minimizes overtopping of the embankment during storm events that exceed the design capacity of the detention basin and/or the blockage of the outlet structure.

The minimum spillway capacity shall be capable of handling a 100-year frequency, 24-hour duration storm event. The spillway must be stabilized and/or armored as appropriate based upon overflow velocities.

6. Basin Configuration

Tops of embankments shall be a minimum of five feet wide. The top of the settled embankment shall be at least two feet above the crest of the emergency spillway structure and at least one foot above the peak 100-year frequency, 24-hour duration storm event surface elevation.

Embankment side slopes shall be 3:1 (Horizontal: Vertical) or flatter for safety and stability purposes and the establishment and maintenance of vegetation.

Concrete conveyance channels shall not be installed in a dry detention basin.

The length-to-width ratio of the basin shall be at least 2:1 (preferably 3:1). The longitudinal and transverse slopes shall be a minimum of 2%.

Drainage design verification requires the use of stormwater routing techniques. Illinois State Water Survey Bulletin 70 Rainfall data shall be utilized with Huff rainfall distribution characteristics. Either continuous event simulation or event hydrograph methods shall be utilized to determine the stage, discharge and volume requirements of the basin design. HEC-HMS, WinTR-20 and WinTR-55 are examples of acceptable public domain hydraulic and hydrological modeling systems. Various commercial propriety programs are also available that may be effectively utilized.

Considerations

Forebays may be constructed at inlets to a dry detention basin to concentrate larger sediment deposits for ease of sediment removal and to reduce the energy of stormwater entering the basin. See practice standard [**SEDIMENT FOREBAY 914**](#).

Dry detention basins are sometimes converted from a construction site [**TEMPORARY SEDIMENT BASIN 957**](#) by removing sediment, adding vegetation, and modifying the outlet structure and emergency spillway. They should not be installed or converted until all construction is complete and the area of disturbed soil is permanently stabilized.

In order to effectively drain the last amount of remaining stormwater runoff in the basin, as well as dry weather flows (from residential sump pump discharge) to the outlet, options may include the installation of a pipe underdrain system, or a pervious, low- flow channel.

If significant side slope erosion is expected, consider armoring techniques. See construction specification [ROCK RIP RAP 61](#) or practice standard [TURF REINFORCEMENT MAT 831](#).

Provisions for safety may be mandatory based on local ordinances.

Dry detention basins may also remove some suspended solids from stormwater by allowing some soil particles to settle during detention. Other pollutants may also be removed especially those attached to sediment particles.

A micropool may be included in a dry detention basin to increase the water quality performance of the basin. A micropool is typically shallow and permanently inundated. Its function is to reduce re-suspension of sediments and guard against vegetative encroachment towards the outlet. The concentration of sediment in the micropool may also help prevent clogging of the outlet.

Dry detention basins may provide an added benefit of open space and recreational use (trails, sports activities, etc.).

Easements and access should be considered during the design phase. Detention basins require periodic inspection and maintenance to ensure proper function.

The outlet structure should be an integral part of the basin embankment.

If a base flow and/or pumped flows are anticipated to enter the basin, practice standards [EXTENDED DETENTION BASIN 810](#) or [WET BOTTOM DETENTION BASIN 811](#) may be a more effective design option.

Plans and Specifications

Plans and specifications for installing a dry detention basin shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose. Standard construction documents, including a grading plan, planting plan, technical specifications, and a facility maintenance plan shall include, at a minimum, the following items:

1. Facility location and alignment.
2. Grade, depth, width, and side slope grade.
3. Facility cross section.
4. Material specifications including planting recommendations.
5. Soil Erosion & Sediment Control Plan.
6. Soil Borings & Geotechnical Report.
7. Vegetative Management Plan

All plans and specifications shall include installation, inspection, and maintenance schedules and also identify the parties responsible for those tasks.

Operation and Maintenance

Sediment accumulation is a maintenance concern that may adversely affect the effectiveness of dry detention basins.

Maintenance for dry detention basins entails vegetation management such as routine weed and invasive species management. Maintenance may also include limiting tree growth. Mowing will be required if planted with turf grass. Trash, debris, and sediment deposits should be removed from the basin, and inlet and outlet structures during routine maintenance.

Periodic inspections should be performed to identify changes in hydrology, vegetation, and soils.

Inspections of the outlet structure, pipe, and emergency spillway should be timed such that the outlet functions at design capacity.

Development of channels or other evidence of erosion within the dry detention basin, or on the side slopes, should be addressed immediately. This may require diverting a portion of the stormwater runoff, or otherwise decreasing flow velocities within the basin.

References

City of Eugene, Oregon. Stormwater Management Manual. Chapter 2 – Stormwater Management Facility Design. Eugene, Oregon. April 2008.

City of Lincoln, Nebraska and the Lower Platte South Natural Resources District. Alternative Stormwater Best Management Practices Guidelines. Chapter 3 – BMP Descriptions. Lincoln, Nebraska. April 2006.

Metropolitan St. Louis Sewer District. Landscape Guide for Stormwater Best Management Practice Design. St. Louis, Missouri. May 2012.

Missouri Department of Natural Resources. Protecting Water Quality: A Field Guide to Erosion, Sediment and Stormwater Best Management Practices for Development Sites in Missouri and Kansas. Section 5 – Permanent Stormwater Control Measures for Post- Construction Runoff Management. Jefferson City, Missouri. January 2011.

Ohio Department of Natural Resources, Division of Soil and Water Conservation. Rainwater and Land Development: Ohio's Standards for Stormwater Management, Land Development and Urban Stream Protection. Chapter 6 – Sediment Control. Columbus, Ohio. December 2006.

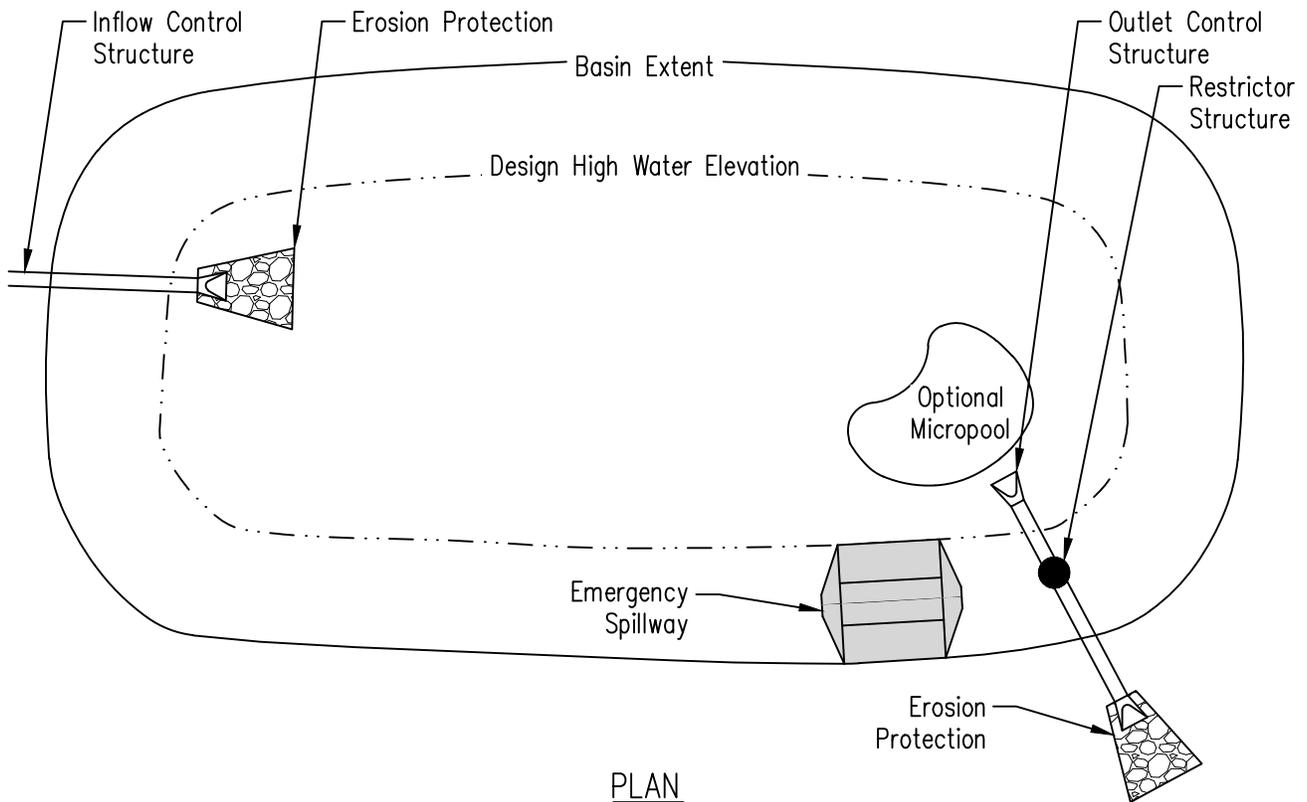
Tennessee Department of Environmental Conservation, Division of Water Pollution Control. Guide to Selection and Design of Stormwater Best Management Practices. Structural Best Management Practices – Detention (Dry) Basin. Knoxville, Tennessee. March 2003.

DuPage County, Illinois, Water Quality Best Management Practices Technical Guidance. Chapter 3.2.3.1 Dry Detention Basins, March 2008

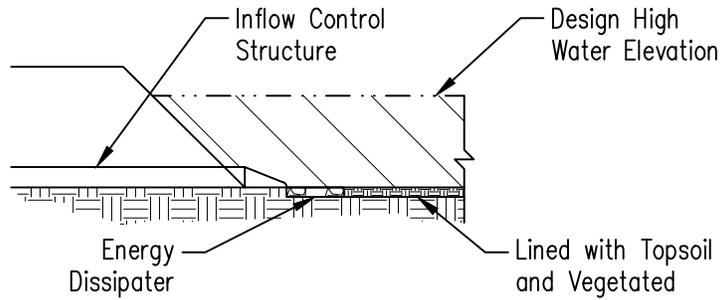
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December 2025

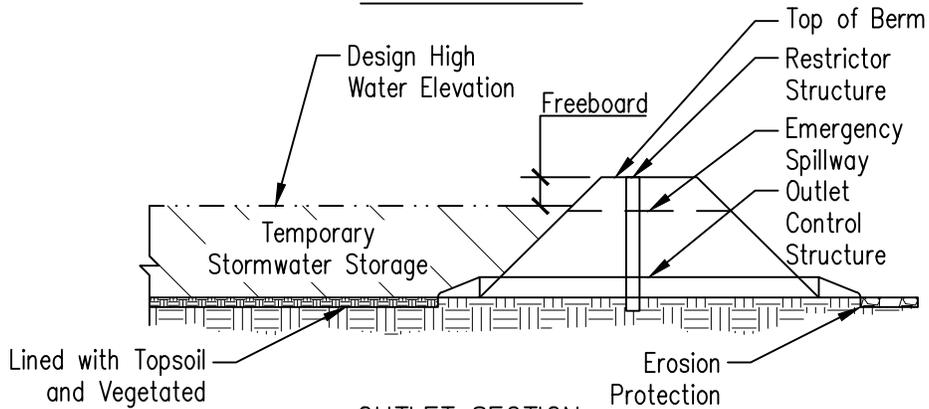
DRY DETENTION BASIN ILLUSTRATION



PLAN



INFLOW SECTION



OUTLET SECTION

REFERENCE	
Project	_____
Designed	_____ Date _____
Checked	_____ Date _____
Approved	_____ Date _____



STANDARD DWG. NO.
IUM-509
SHEET 1 OF 1
DATE DECEMBER 2025

ILLINOIS URBAN MANUAL PRACTICE STANDARD

Extended Detention Basin

(feet)

Code 810



Source: Mile High Flood District

Definition

An extended detention basin is a vegetated basin designed to detain stormwater runoff and slowly release the water.

Purpose

The purpose of an extended detention basin is to enhance the basin performance by increasing the detention volume capture time for the smaller, more frequent storm events so as to limit downstream scour and loss of aquatic habitat by reducing the peak flow rate and energy of stormwater discharges. Extended detention basins are also designed to remove suspended solids from stormwater by allowing sediment to settle out of the water column during detention. Other pollutants may also be removed especially those associated with, or attached to, sediment particles.

Conditions Where Practice Applies

This practice applies where the following or similar conditions exist:

1. Where downstream property would be subject to increased flooding without attenuation of flow rate for major storm events;

2. Where the downstream watercourse is not experiencing significant scour and loss of aquatic habitat;
3. Basin site is located in a permanent, post-construction area;
4. Site conditions allow the detention basin to be configured so the inlet(s) are as far away from the outlet structure as possible;
5. Basin is located in an area that allows frequent inspection and ease of maintenance;
6. Drainage area is between 5 and 50 acres;
7. Where structural failure of the detention basin will not result in loss of life, damage to homes, commercial or industrial buildings, main highways or railroads; or in the use or service of public utilities;
8. Basin is not located over utility lines;
9. Basin bottom does not intersect the groundwater table;
10. Basin is not located over a septic field;
11. Basin is not located over an area of karst topography; and
12. Basin is not constructed on a stream or in a delineated wetland area.

Criteria

Construction projects may be subject to local, county, state, and federal rules and regulations.

Extended detention basin design plans and specifications shall be signed and sealed by an Illinois Licensed professional engineer.

Plans and specifications shall be followed by the site superintendent and field personnel during the construction process.

The basin design shall include the following components:

1. Basin Inflow Control Structures

In addition to culvert headwalls, flared end sections or other inflow treatments Energy dissipaters shall be used to reduce the velocity

of incoming stormwater at all inlets. See practice standard [ROCK OUTLET PROTECTION 910](#).

2. Temporary Stormwater Storage

The temporary storage is located above the surface of the basin bottom and pool elevation of sediment forebays.

3. Sediment Forebays

Forebays are required on all inlets to an extended detention basin to concentrate larger sediment for easier removal and to reduce the energy of stormwater entering the basin. See practice standard [SEDIMENT FOREBAY 914](#).

4. Plantings

The basin surface shall be lined with top soil and vegetated with turf, or native vegetation to help prevent erosion

Trees or shrubs shall not be planted in the basin or embankment footprint.

5. Basin Outlet Control Structure.

The structure shall be designed to draw down the temporary storage within a 24- 48 hour period at discharge rates, controlled by multiple orifices located within the structure, that at a minimum, do not increase over pre-construction conditions for the 2-year frequency, 24- hour duration and the 100- year frequency, 24-hour duration storm events.

The structure shall be protected by trash racks, grates or other similar devices. Erosion protection shall be installed at the outfalls to further reduce scour. See practice standard [ROCK OUTLET PROTECTION 910](#).

Outlet structures must be accessible to inspectors, easy to maintain, and be resistant to clogging by plant material or debris.

Outlet structures shall be constructed of reinforced concrete, or other suitable materials.

6. Emergency Spillway

An emergency spillway shall be included in addition to the outlet control structure. The emergency spillway controls the location of, and minimizes overtopping of the embankment during storm events that exceed the design capacity of the extended detention basin, and/or the blockage of the outlet structure.

The minimum spillway capacity shall be capable of handling a 100-year frequency 24-hour duration storm event. The spillway must be stabilized and/or armored as appropriate based upon overflow velocities.

7. Basin Configuration

Tops of embankments shall be a minimum of five feet wide. The top of the settled embankment shall be at least two feet above the crest of the emergency spillway structure and at least one foot above the peak 100-year, frequency 24-hour duration storm event surface elevation.

Embankment side slopes shall be 3:1 (Horizontal:Vertical) or flatter for safety and stability purposes and the establishment and maintenance of vegetation.

Concrete conveyance channels shall not be installed in an extended detention basin.

The length-to-width ratio of the basin shall be at least 2:1 (preferably 3:1 or greater). The longitudinal and transverse slopes shall be a minimum of 2%.

Drainage design verification requires the use of stormwater routing techniques. Illinois State Water Survey Bulletin 70 Rainfall data shall be utilized with Huff rainfall distribution characteristics. Either continuous event simulation or event hydrograph methods shall be utilized to determine the stage, discharge and volume requirements of the basin design. HEC-HMS, WinTR-20 and WinTR-55 are examples of acceptable public domain hydraulic and hydrological modeling systems. Various commercial propriety

programs are also available that may be effectively utilized.

Considerations

A micropool may be included in an extended detention basin to increase the water quality performance of the basin. A micropool is typically shallow and permanently inundated. Its function is to reduce re-suspension of sediments and guard against vegetative encroachments towards the outlet. A deep pool may be included adjacent to the outlet structure to allow for proper drawdown. Deep pools are generally 18-36 inches deep. Submerged and floating plants should not be used in deep pools located near the outlet structure. A slope transition zone shall be designed around the perimeter of deep pools. The transition zone slope shall be 5:1 or flatter. The point of transition shall start 6 to 12 inches below the pool elevation. Sediment shall be removed from a micropool when the sediment exceeds 50% of the volume capacity of the micropool. The sediment removal method shall not cause negative impacts to the bottom of the basin or the side slopes.

Extended detention basins can provide an added benefit of open space and recreational use (trails, sports activities, etc.) during dry periods.

The bottom of the basin should be vegetated and may require a pipe underdrain system to maintain a dry bottom (if no micropools). If significant side slope erosion is expected, consider stabilizing or armoring techniques. See construction specification [**ROCK RIPRAP 61**](#) or practice standard [**TURF REINFORCEMENT MAT 831**](#), or other measures such as articulated concrete blocks, erosion control blanket, geotextile fabric, or similar Best Management Practice.

A [**DRY DETENTION BASIN 809**](#) can be converted to an extended detention basin by incorporating multi stage orifices in the outlet control structure to reduce the lesser storm event outflow rate and other related basin modifications.

Extended detention basins can sometimes be converted from a construction site [**TEMPORARY SEDIMENT BASIN 957**](#) by

removing sediment, adding vegetation, and modifying the primary outlet structure and the emergency spillway. They should not be installed until all construction is complete and the site is completely stabilized.

Easements and access should be considered during the design phase. Detention basins require periodic inspection and maintenance to ensure proper function.

Provisions for safety may be mandatory based on local ordinances.

The outlet structure should be an integral part of the embankment.

Plans and Specifications

Plans and specifications for installing an extended detention basin shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose. Standard construction documents, including a grading plan, planting plan, technical specifications, and a facility maintenance plan shall include at a minimum, the following items:

1. Facility location and alignment;
2. Grade, depth, width, and side slope grade;
3. Facility cross section;
4. Material specifications including planting recommendations;
5. Soil Borings & Geotechnical Report;
6. Soil Erosion & Sediment Control Plan;
7. Vegetative Management Plan;

All plans and/or specifications shall include installation, inspection, and maintenance schedules, and identify the parties responsible for those tasks.

Operation and Maintenance

Trash, debris and sediment deposition should be removed from the basin, forebay, and inlet and outlet structures.

Areas of turf grass require periodic mowing.

Periodic inspections should be performed to identify changes in hydrology, vegetation, and soils.

Particularly when extended detention basins are new, it is important to make sure water levels along the surface of the basin are suitable for the growth of vegetation. Inspections of the outlet structure, pipe, and emergency spillway should be timed such that the outlet functions at design capacity.

Development of channels or other evidence of erosion within the extended detention basin should be addressed immediately.

References

Metropolitan St. Louis Sewer District. Landscape Guide for Stormwater Best Management Practice Design. St. Louis, Missouri. May 2012.

Mid-America Regional Council. Manual of Best Management Practices for Stormwater Quality. Chapter 8 – General Guidance for Structural BMPs: Engineered Systems. Kansas City, Missouri. March 2008.

Minnesota Pollution Control Agency. Minnesota Stormwater Manual. Chapter 12 – Best Management Practice Details. St. Paul, Minnesota. January 2008.

Missouri Department of Natural Resources. Protecting Water Quality: A Field Guide to Erosion, Sediment and Stormwater Best Management Practices for Development Sites in Missouri and Kansas. Chapter 6, Section 5. Jefferson City, MO. January 2011.

New Jersey Department of Environmental Protection. New Jersey Stormwater Best Management Practices Manual. Chapter 9.4 – Standard for Extended Detention Basins. Trenton, New Jersey. February 2004.

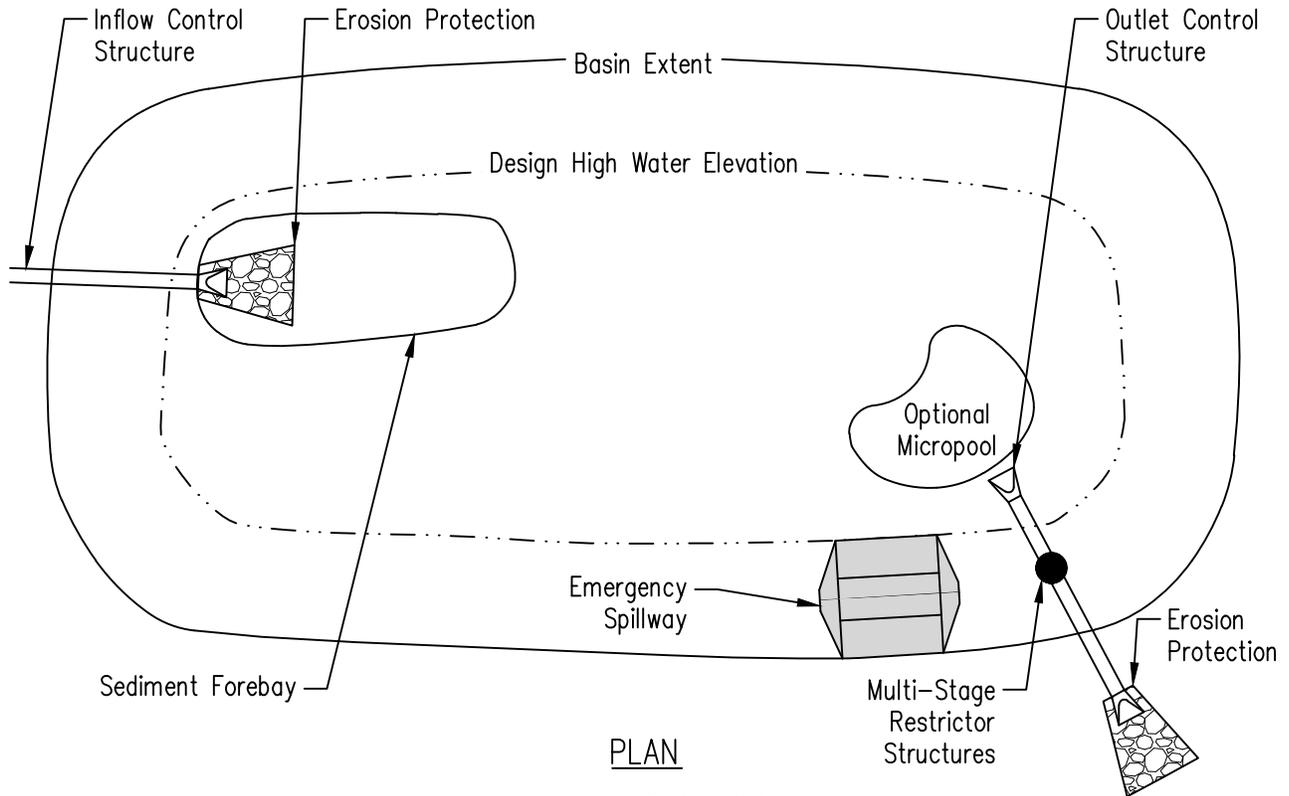
North Carolina Department of Environmental and Natural Resources, Division of Water Quality. Stormwater BMP Manual. Chapter 17 – Dry Extended Detention Basin. Raleigh, North Carolina. July 2009.

Tennessee Department of Environmental Conservation, Division of Water Pollution Control. Guide to Selection and Design of Stormwater Best Management Practices. Structural Best Management Practices – Detention (Dry) Basin. Knoxville, Tennessee. March 2003.

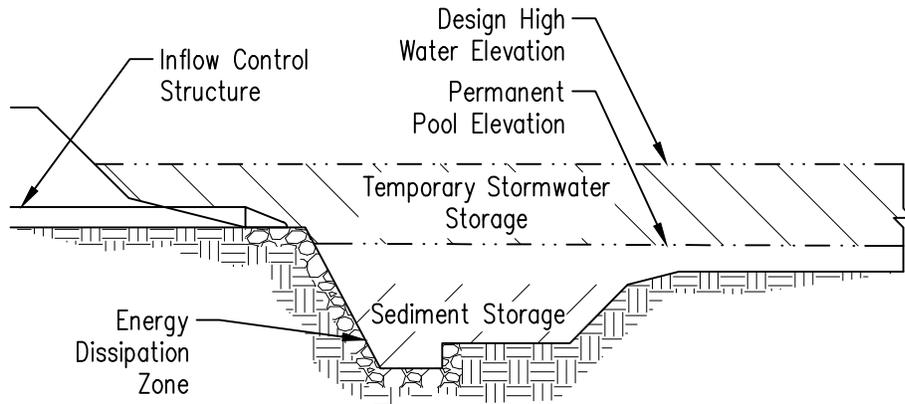
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December 2025

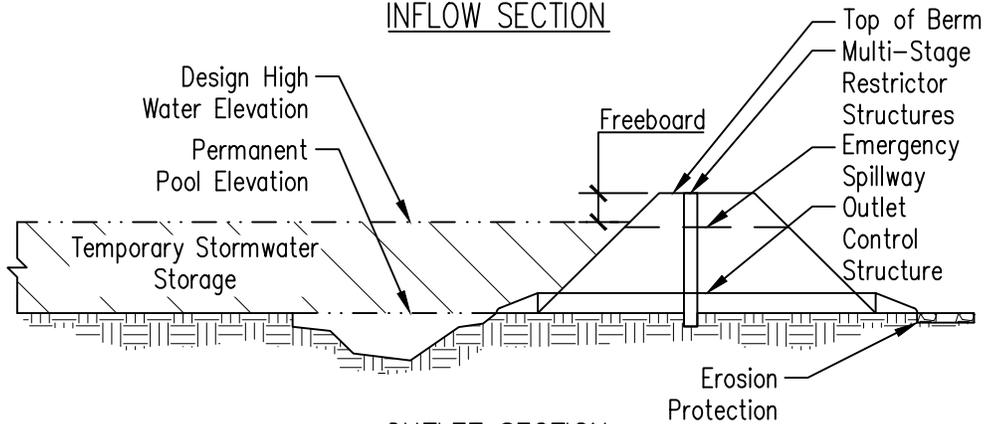
EXTENDED DETENTION BASIN ILLUSTRATION



PLAN



INFLOW SECTION



OUTLET SECTION

REFERENCE	
Project _____	
Designed _____ Date _____	
Checked _____ Date _____	
Approved _____ Date _____	



STANDARD DWG. NO.
IUM-510
 SHEET 1 OF 1
 DATE DECEMBER 2025

ILLINOIS URBAN MANUAL
PRACTICE STANDARD

Wet Bottom Detention Basin

(feet)

Code 811



Source: Tetra Tech, Inc.

Definition

A wet bottom detention basin designed to detain stormwater runoff while maintaining a permanent pool of open water throughout the year.

Purpose

The purpose of a wet bottom detention basin is to reduce flooding by attenuating peak flows and also to limit downstream scour and loss of aquatic habitat by reducing the peak flow rate and energy of stormwater discharges, as well as improvement of water quality by allowing suspended solids to settle. Nutrient uptake by plants may also be a benefit.

Conditions Where Practice Applies

This practice applies where the following or similar conditions exist:

1. Where downstream property would be subject to increased flooding without attenuation of flow rate for major storm events;
2. Where the downstream watercourse is experiencing scour and

- loss of aquatic habitat;
3. Basin site is located in a permanent, post-construction area;
 4. Site conditions allow for sufficient stormwater runoff or groundwater supplies to provide year-round hydration;
 5. Site conditions allow the basin to be configured so the inlet(s) are as far away from the outlet structure as possible;
 6. Basin is located in an area that allows periodic inspection and ease of maintenance;
 7. Drainage area is between 10 and 50 acres;
 8. Where structural failure of the detention basin will not result in loss of life, damage to homes, commercial or industrial buildings, main highways or railroads; or in the use or service of public utilities;
 9. Basin is not located over utility lines;
 10. Basin is not located over a septic field;
 11. Basin is not located over an area of karst topography; and
 12. Basin is not constructed on streams, or within a delineated wetland area.

Criteria

Construction projects may be subject to local, county, state and federal rules and regulations.

Wet bottom detention basin design plans and specifications shall be signed and sealed by an Illinois licensed professional engineer.

Plans and specifications shall be followed by the site superintendent and field personnel during the construction process of the basin.

The basin design shall include the following components:

1. Basin Inflow Control Structure

In addition to culvert headwalls, flared end sections or other inflow treatments Energy dissipaters shall be used to reduce the velocity of incoming stormwater at all inlets. See practice standard [**ROCK OUTLET PROTECTION 910.**](#)

2. Temporary Stormwater Storage

In addition to the permanent pool volume, the basin must also have temporary stormwater runoff storage to provide discharge rate reduction during storm events. The temporary storage is located above the surface of the permanent pool and below the design high water elevation.

3. Sediment Storage

The basin shall be designed with sufficient sediment storage to allow proper operation between scheduled cleanouts.

4. Vegetated Shelf

A vegetated shelf at least ten feet wide shall be designed around the perimeter of the permanent pool. The shelf slope shall be 5:1 (Horizontal: Vertical) or flatter. The inner edge of the shelf shall be located no more than 12 inches below the level of the permanent pool while the outer edge of the shelf shall be no more than 12 inches above the permanent pool.

5. Plantings

Shelves in the wet bottom detention basins shall incorporate several diverse native species of shallow water emergent and herbaceous vegetation. Plant diversity increases the chances vegetation will survive minor changes in the permanent pool water level.

For areas outside of the permanent pool and perimeter shelf plantings the basin surface shall be lined with top soil and vegetated with turf, or native grass to help prevent erosion. Trees or shrubs shall not be planted in the basin or embankment footprint.

6. Basin Outlet Control Structure

Outlet structures must be accessible to inspectors, easy to maintain, resistant to clogging by plant material or debris.

The structure shall be designed to draw down the temporary storage within a 24-48 hour period at discharge rates, controlled by multiple orifices located within the structure, that at a minimum,

do not increase over pre-construction conditions for the 2-year frequency, 24- hour duration storm event and the 100- year frequency, 24-hour duration storm events.

Outlet structures shall be constructed of reinforced and anchored concrete, or other suitable materials.

The area adjacent to the outlet structure must be kept free of vegetation to prevent clogging. The structure shall be protected by trash racks, grates or other approved devices. Erosion protection shall be installed at the outfall to prevent scour. See practice standard [ROCK OUTLET PROTECTION 910.](#)

7. Emergency Spillway

An emergency spillway shall be included in addition to the outlet control structure. The emergency spillway controls the location of, and minimizes overtopping of the embankment during storm events that exceed the design capacity of the detention basin. and/or the blockage of the outlet structure.

The minimum spillway capacity shall be capable of handling a 100-year frequency, 24-hour duration storm event. The spillway must be stabilized and/or armored as appropriate based upon overflow velocities.

8. Basin Configuration

Tops of embankments shall be a minimum of five feet wide. The top of settled embankment shall be at least two feet above the crest of the emergency spillway structure and at least one foot above the peak 100-year frequency, 24- hour duration storm event surface elevation

Basin flow paths shall be designed with the inlets as far upstream from the outlet control structure as possible.

The basin length-to-width ration shall be at least 2:1 (Horizontal: Vertical). (preferably 3:1 or greater).

Side slopes (berms) shall be 3:1 or flatter (Horizontal: Vertical) for purposes of safety and stability, and the establishment and maintenance of vegetation.

The average depth of the permanent pool shall be 3 - 6 feet. The maximum pool depth shall be 9 feet.

Design verification requires the use of stormwater routing techniques. Illinois State Water Survey Bulletin 70 Rainfall data is to be utilized with Huff rainfall distribution characteristics. Either continuous event simulation or event hydrograph methods shall be utilized to determine the stage, discharge, volume requirements of the basin design. HEC- HMS, WinTR-20 and WinTR-55 are examples of public domain hydraulic and hydrological modeling systems. Various commercial propriety programs are also available that may be effectively utilized.

Wet bottom detention basins that intersect ground water shall not be used where site land use or activities generate contaminated runoff.

Considerations

Sediment Forebays may be constructed at all inlets to a wet bottom detention basin to concentrate larger sediment for ease of removal and to reduce the energy of stormwater entering the basin. See practice standard [**SEDIMENT FOREBAY 914**](#).

Wet bottom detention basins can provide an added benefit to the community of being aesthetically pleasing to people while also providing habitat for wildlife. Aeration devices may be used to reduce algae buildup and foul odors.

Canada geese are attracted to open lawns adjacent to water. They often become a nuisance through aggressive behavior, leaving large amounts of fecal material, and damaging lawns. Creating a 20-30 foot wide buffer of native prairie plants around the basin will help deter Canada geese by impeding the movement to and from water, making less tender shoots available as food, and blocking their line of sight of potential predators.

Best Management Practices may be implemented to also reduce other invasive animals that could cause damage to the pond such as muskrats. Muskrats can be a nuisance by digging into the banks causing erosion and leading to water seeping out of the basin.

Wet bottom detention basins are sometimes converted from a construction site [**TEMPORARY SEDIMENT BASIN 957**](#) by removing sediment, adding vegetation, and modifying the outlet structure. They should not be installed until all construction is complete and the area disturbed by construction is completely permanently stabilized.

A wet bottom detention basin located in highly permeable soil may require the installation of an impermeable liner to sustain a permanent pool of water.

Easements and access should be considered during the design phase. Detention basins require frequent inspection and maintenance to ensure proper function.

Provisions for safety may be mandatory based on local ordinance.

The outlet structure should be an integral part of the embankment.

Plans and Specifications

Plans and specifications for installing a wet bottom detention basin shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose. Standard construction documents, including a grading plan, planting plan, technical specifications, and a facility maintenance plan should include at a minimum the following items:

1. Facility location and alignment;
2. Grade, depth, width, and side slope grade;
3. Facility cross section;

4. Material specifications including planting recommendations;
5. Soil Boring & Geotechnical Report ;
6. Soil Erosion & Sediment Control Plan;

All plans and/or specifications shall include the installation, inspection, and maintenance schedules and identification of the parties responsible for those tasks.

Managing plant establishment, weed and invasive species control, prescribed burning, etc. should be part of a Basin Vegetative Management Plan.

Operation and Maintenance

An operation and maintenance plan shall be provided for the wet bottom detention basin.

Once established, wet bottom detention basins should be inspected once a month and after major storm events. Maintenance for wet bottom detention basins shall include monitoring of the aquatic environment for water clarity and algal growth. Vegetation located on the shelf must be maintained to achieve additional pollutant removal and to prevent erosion. For upland areas planted in turf grass, maintenance consists primarily of routine mowing.

A benchmark should be established for sediment removal. Sediment accumulation should be monitored through visual inspection of the basin bottom and the sediment accumulation marker during routine maintenance. When the specified depth of sediment has been reached in either the forebay or main basin, accumulated sediment should be removed and disposed of properly.

References

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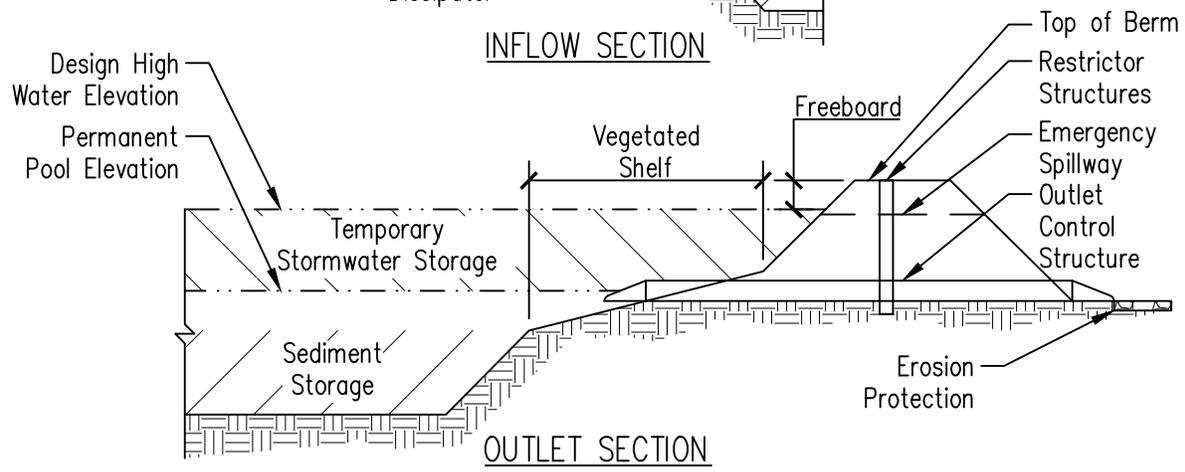
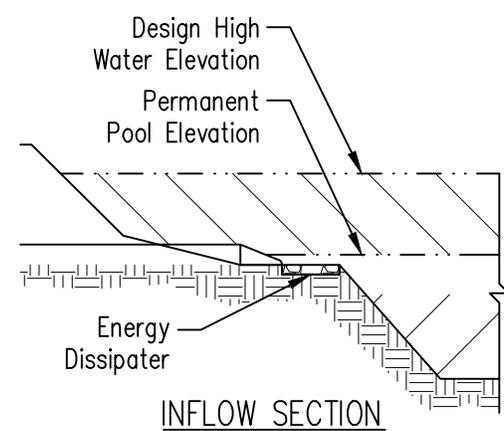
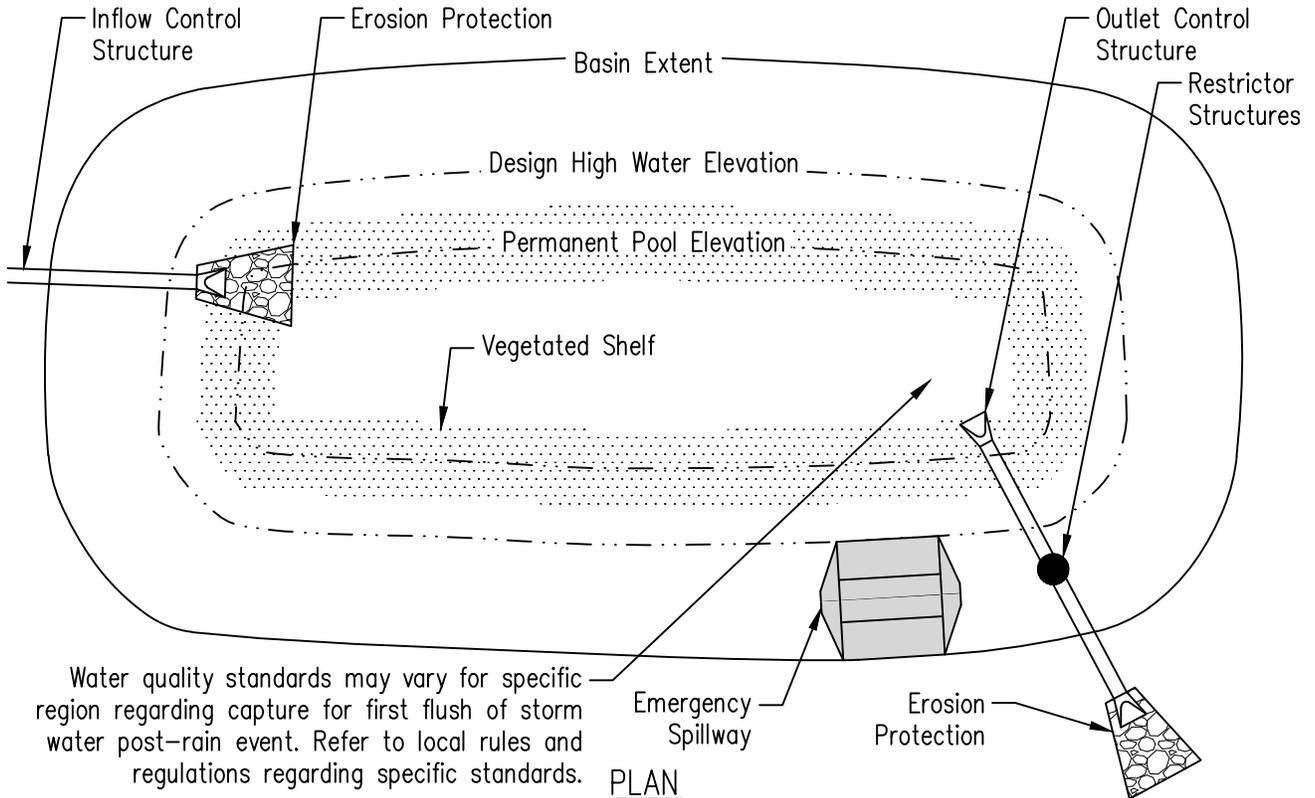
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December 2025

WET BOTTOM DETENTION BASIN ILLUSTRATION



REFERENCE	
Project	_____
Designed	_____ Date _____
Checked	_____ Date _____
Approved	_____ Date _____



STANDARD DWG. NO.
IUM-511
 SHEET 1 OF 1
 DATE DECEMBER 2025

ILLINOIS URBAN MANUAL
PRACTICE STANDARD

Wetland Detention Basin

(feet)
CODE 812



(Source: NCDENR Stormwater BMP Manual)

Defintition

A constructed system designed to function as a natural wetland by lessening the impacts of stormwater through physical, chemical, and biological processes.

Purpose

Wetland detention basins are designed and installed to maximize pollutant removal and create wetland habitat through the creation of a matrix of water, sediment, plants, and detritus that collectively provides temporary storage of stormwater runoff, and removes multiple pollutants from it through a series of complimentary physical, chemical, and biological pathways.

Conditions Where Practice Applies

This practice applies where the following or similar conditions exist:

1. Watersheds where stormwater quality and quantity control is needed;

2. Site is not located within a delineated natural wetland area;
3. Site is located in a permanent, post-construction area;
4. Site conditions allow for sufficient drainage or groundwater supplies to provide year-round hydration;
5. Maximum tributary area is dependent on the total volume and release of water;
6. Detention basin is located in an area that allows frequent inspection and ease of maintenance; and,
7. Detention basin is not located over existing utility lines.

Criteria

Construction projects may be subject to local, county, state and federal rules and regulations. Wetland detention basins shall be designed by a registered professional engineer as part of the overall site design for long-term stormwater control. A landscape architect should be used to determine types of plants needed and locations in the facility. A landscape architect may also provide valuable insight during the design, construction and maintenance phases. Plans and specifications shall be referred to by the site superintendent and field personnel during the construction process.

Wetland detention basins require larger land areas than other detention basins and may not be suitable for areas with limited available land. They shall not be constructed on streams or in jurisdictional wetlands.

Forebays are required on all inlets to a wetland detention basin to concentrate larger sediment for easier removal and to reduce the energy of stormwater entering the basin. The forebay shall be lined with vegetation and/or gravel.

Wetland detention basins must contain a diversity of depth zones to meet the unique growing requirements of emergent wetland plants. A diverse and dense wetland plant community needs to be

established in the shortest possible time. High pollutant removal efficiencies depend on a dense cover of emergent plants. A typical mix consisting of a variety of species shall be planted, of which some are emergent species, with no more than 30% of a single species.

Flow paths from inlet to outlet within wetland detention basins must be maximized. A minimum length-to-width ratio of 1.5:1 for the basin is required but a flow path of at least 3:1 is recommended. Internal berms or varied depths can be used to achieve maximum flow paths.

The total surface area should be broken into several micropools that are spread throughout the wetland detention basin. One deep pool should be located at the inlet and one should be located at the outlet. Other deep pools should be dispersed throughout the wetland. Deep pool areas of wetland detention basins consist of permanent deep pools of water that retain water year-round. Deep pools shall be 18-36 inches deep. Deep pools located at the inlet shall include additional depth (an additional 12 inches) for sediment accumulation. Shallow water areas shall be one to six inches deep. Submerged and floating plants may be used in deep pools except near the outlet structure. A deep pool shall be included adjacent to the outlet structure to allow for proper drawdown.

Side slopes of a wetland detention basin shall be 5:1 (H:V) or flatter.

Outlet structures must be accessible to inspectors, easy to maintain, resistant to clogging by plant material or debris. Wetland detention basins shall have varied outlet sizes unless bypasses are provided for storms in excess of the design capacity. The low-capacity outlet shall be designed to draw down the temporary pool within 72 hours. Multiple outlet structures may be used to

balance the volume control requirements and maintenance needs. Outlet structures shall be constructed of reinforced and anchored concrete. The area adjacent to the outlet structure must be kept free of vegetation to prevent clogging. The structure shall be protected by trash racks, grates or other approved devices. Erosion protection shall be installed at the outfall to prevent scour.

An emergency spillway shall be included in addition to the primary outlet structure. The emergency spillway prevents overtopping of the embankment during storm events that exceed the design capacity of the detention basin. The minimum spillway capacity should be capable of handling a 100-year, 24-hour storm event. A minimum of one foot of freeboard must be maintained above the maximum stage of the basin.

A vegetated swale shall be built around the basin from the forebay to near the outfall of the outlet structure. A small berm will be set up between the forebay and bypass. The swale shall be used as a bypass to divert significant flow from rain events from entering the basin.

Wetland detention basins must be stabilized within 14 days of construction. Stabilization may be in the form of final vegetation plantings or through temporary means until vegetation becomes established.

Wetland detention basins that intersect ground water should not be used where land use or activities generate highly contaminated runoff.

Considerations

Wetland detention basins can provide an added benefit to the community of being aesthetically pleasing to people while also providing habitat for wildlife.

Canada geese are attracted to open lawns adjacent to water. They often become a nuisance through aggressive behavior, leaving large amounts of fecal material, and damaging lawns. Creating a 20-30 foot wide buffer of unmowed native prairie plants around the basin will help deter Canada geese by impeding the movement to and from water, making fewer tender shoots available as food, and blocking their line of sight.

BMPs may be implemented to also reduce other invasive animals that could cause damage to the pond such as muskrats. Muskrats are a nuisance by digging into the banks causing erosion and water to seep out.

Wetland detention basins are sometimes converted from a construction site [TEMPORARY SEDIMENT BASIN 957](#) by removing sediment, modifying the basin geometry, adding vegetation, and modifying the inlet and outlet structures. They should not be installed until all construction is complete and the site is completely stabilized.

The best way to establish the wetland plant community is by transplanting stock native to the region. Cattails should be avoided as they can quickly take over the wetland plant community and limit biodiversity. Habitat diversity should be designed to meet the requirements for a wide range of aquatic, avian, and terrestrial species.

Wetland detention basins located in highly permeable soils or areas of karst topography may require the installation of a liner to prevent groundwater contamination or sinkhole formation and to help sustain a permanent pool of water. At least four inches of appropriate topsoil must be added to the liner to support plant growth.

Easements and access must be considered during the design phase. Wetland detention basins require frequent inspection and maintenance to ensure proper function.

Provisions for safety may be mandatory based on local ordinance and should be considered regardless of requirements.

Plans and Specifications

Plans and specifications for installing a wetland detention basin shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose. At a minimum include the following items:

1. Construction sediment and erosion control plan
2. Facility location and alignment
3. Grade, depth, width, and side slope grade
4. Facility cross section
5. Material specifications
6. Facility maintenance plan

All plans shall include the installation, inspection, and maintenance schedules with the responsible party identified.

Operation and Maintenance

An operation and maintenance plan shall be provided for the wetland detention basin.

Following construction of the wetland detention basin, inspections shall be conducted twice a week until vegetation has become established. Wetland plants shall be watered as necessary until the basin water levels have stabilized.

Once established, wetland detention basins should be inspected once a month and within 24 hours after a storm event greater than one inch to prevent clogging of the outlet structure.

A comprehensive inspection of the wetland detention basin should be performed twice a year for the first three years, with an annual inspection thereafter. Inspections should be conducted with the as-built and plans in hand, and should take note of species distribution/survival, sediment accumulation, water elevations, and condition of the outlet. If a minimum coverage of 70 percent is not achieved in the planted zones after the second growing season, supplemental planting should be completed. Records should be maintained to track the development of the wetland system over time. Periodic weed control should be used throughout the life of the basin.

Trash and debris should be removed from the basin and forebay during routine maintenance.

Sediment accumulation is a maintenance concern that may adversely affect the effectiveness of wetland detention basins. Accumulated sediment in the forebay should be removed every three to five years. Removal should be conducted with a backhoe or similar equipment after draining the forebay. After removal, sediment should be disposed of properly.

References

Metropolitan St. Louis Sewer District. Landscape Guide for Stormwater Best Management Practice Design. St. Louis, Missouri. May 2012.

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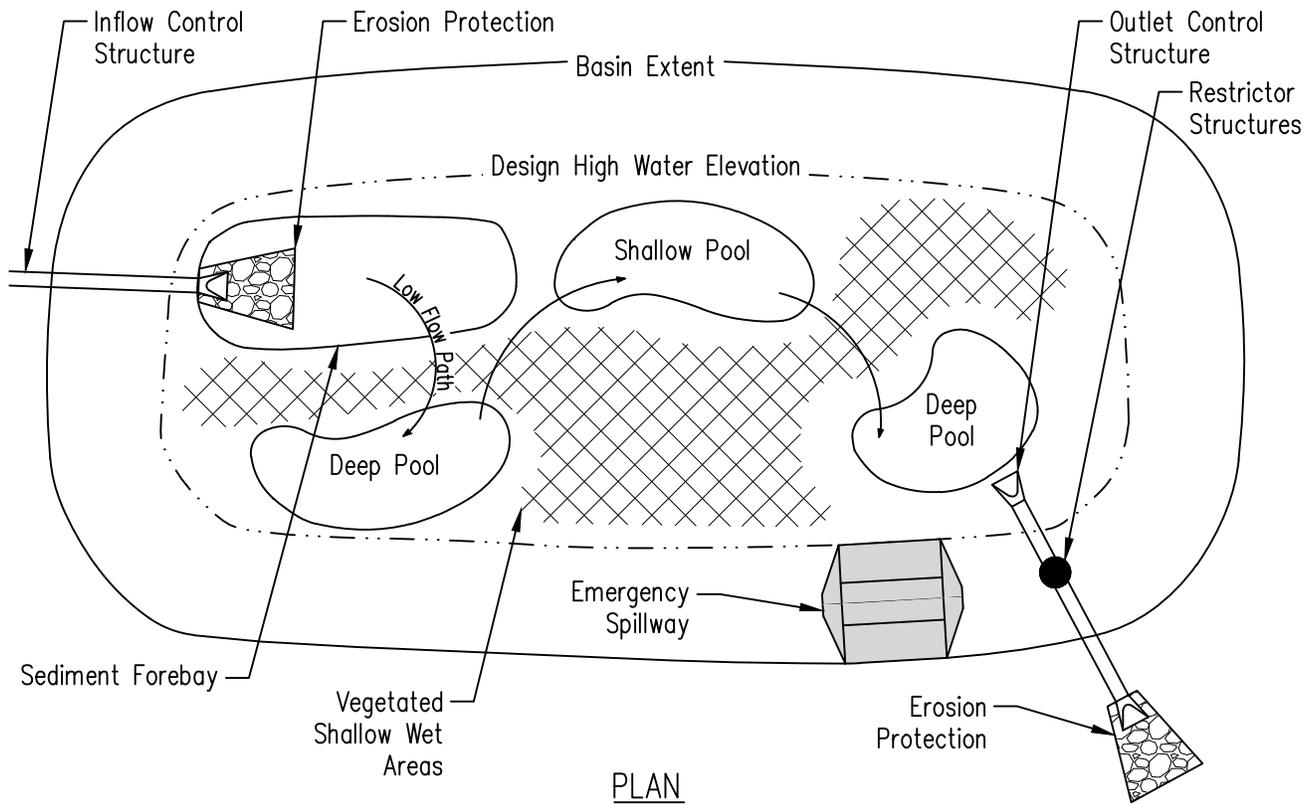
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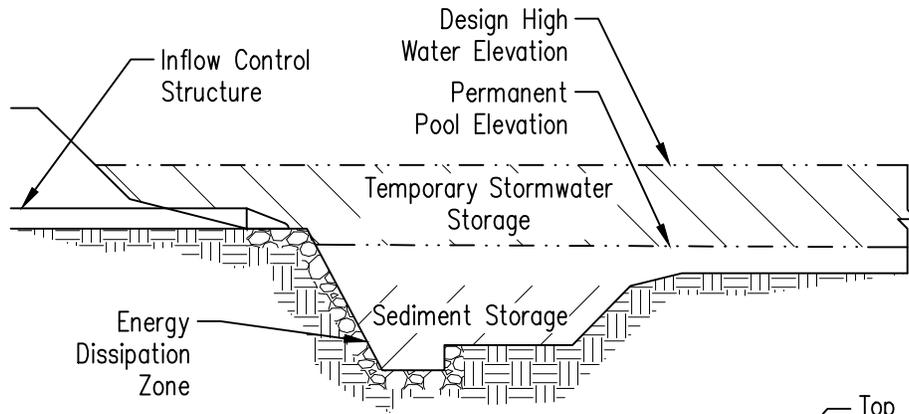
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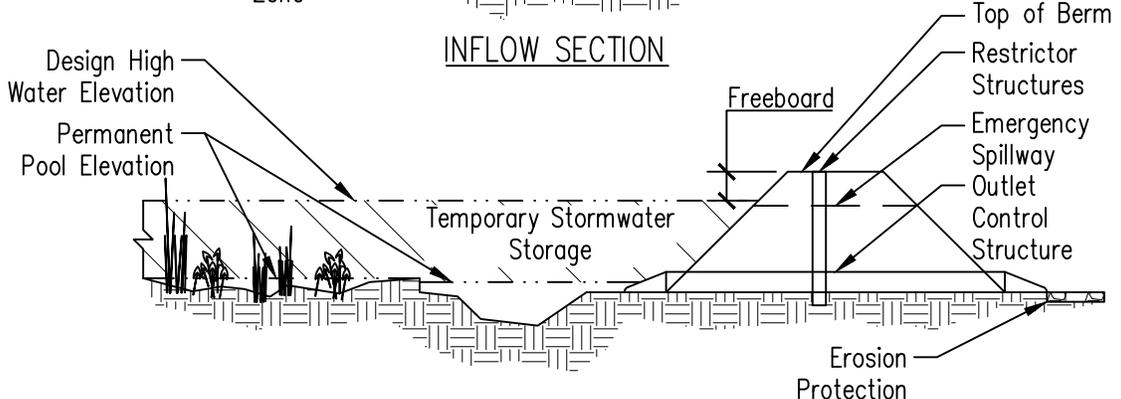
WETLAND DETENTION BASIN ILLUSTRATION



PLAN



INFLOW SECTION



OUTLET SECTION

REFERENCE	
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Approved	_____ Date _____



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