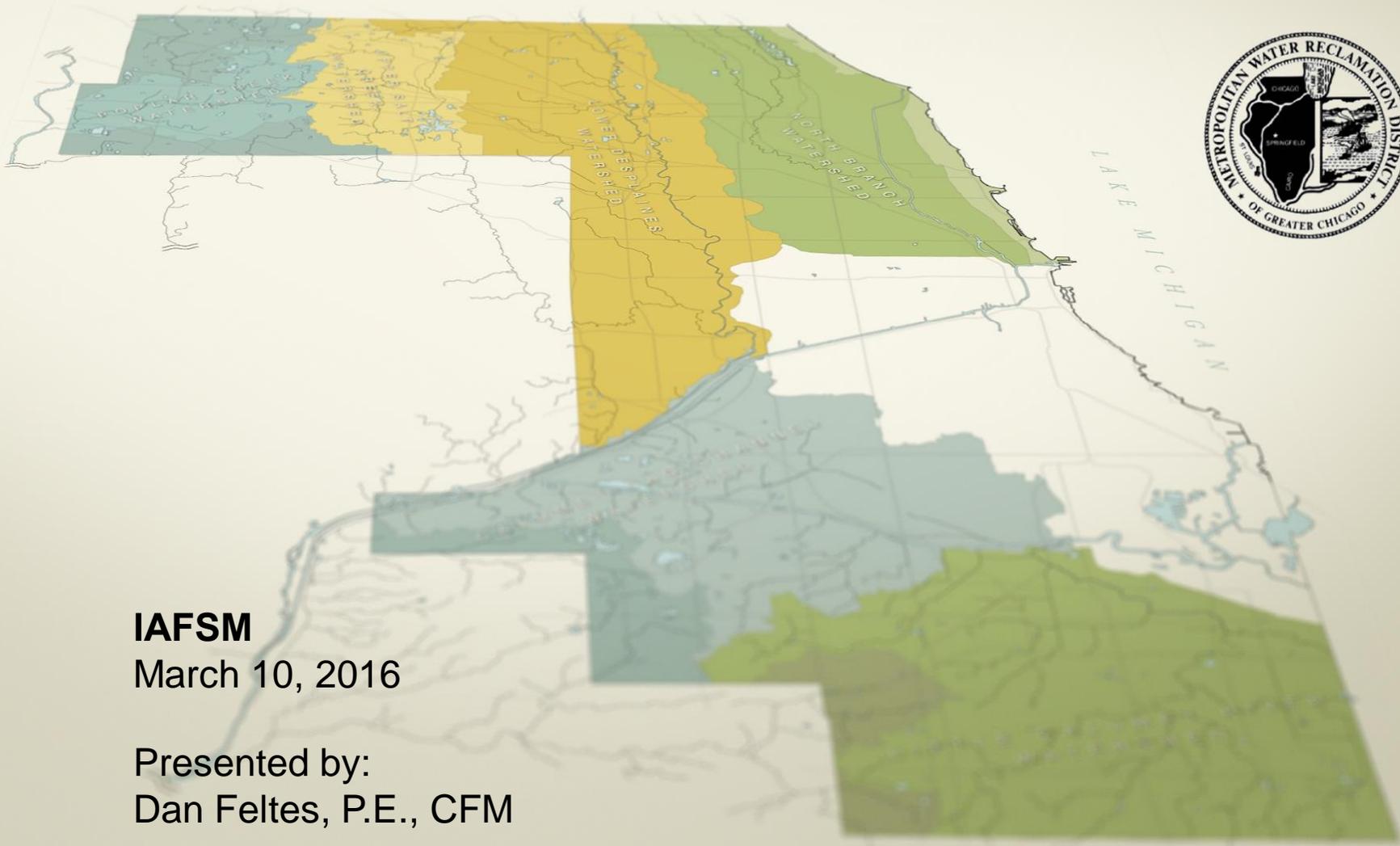


Watershed Management Ordinance (WMO)



IAFSM

March 10, 2016

Presented by:

Dan Feltes, P.E., CFM



WMO Update Agenda

- “ Brief WMO Development Background
- “ Permit Applicability
- “ Permit Compliance Resources and Website
- “ Permit Time
- “ How to Calculate Volume Control
- “ Flood Protection Elevation
- “ WMO Stormwater Volume Results from 2015
- “ WMO Forthcoming Developments

Summary of MWRD Facilities:
 7 Water Reclamation Plants
 (including one of the worlds largest)
 ~ 554 Miles of Interceptors
 ~ 109 Miles of Tunnels
 ~ 10.6 Billion Gallons of CSO Storage





Thornton Composite Reservoir



- “ 7.9 BG CSO Reservoir
- “ Largest in the World
- “ 83 Acres
- “ 2,480 Ft X 1,580 Ft
- “ 300 Feet Deep

District Responsibilities



Wastewater Treatment

- . 7 Wastewater Treatment Plants
- . Stickney 1.2 billion gallons per day



Stormwater Management

- . Public Act 093-1049
- . Public Act 098-0625



WMO Objective

Establish uniform, minimum, and comprehensive countywide stormwater management regulations

Enabling Legislation

Watershed Management Ordinance

§ Stormwater management in Cook County shall be under the general supervision of the Metropolitan Water Reclamation District of Greater Chicago.+

§ The District may prescribe by ordinance reasonable rules and regulations for floodplain and stormwater management . . . in Cook County.+

Public Act 093-1049



Sewer Permit Ordinance

- “ Sanitary Sewers
- “ Stormwater Detention
 - “ TP-40 Rainfall Data
 - “ Modified Rational Method

Watershed Management Ordinance

- “ Sanitary Sewers
- “ Stormwater Detention
 - “ Bulletin-70 Rainfall Data
 - “ Flat Release Rate
 - “ Hydrograph Method
- “ Volume Control
- “ Erosion & Sediment
- “ Flood Protection Areas
 - “ Floodplain
 - “ Floodway
 - “ Isolated Wetlands
 - “ Riparian Areas



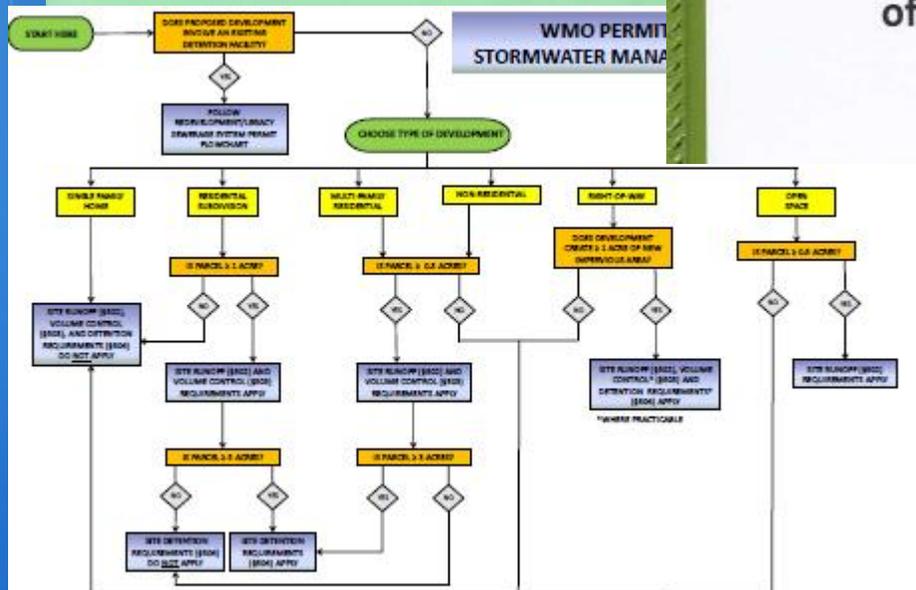
Watershed Management Ordinance

Effective
May 1, 2014
As amended
July 10, 2014



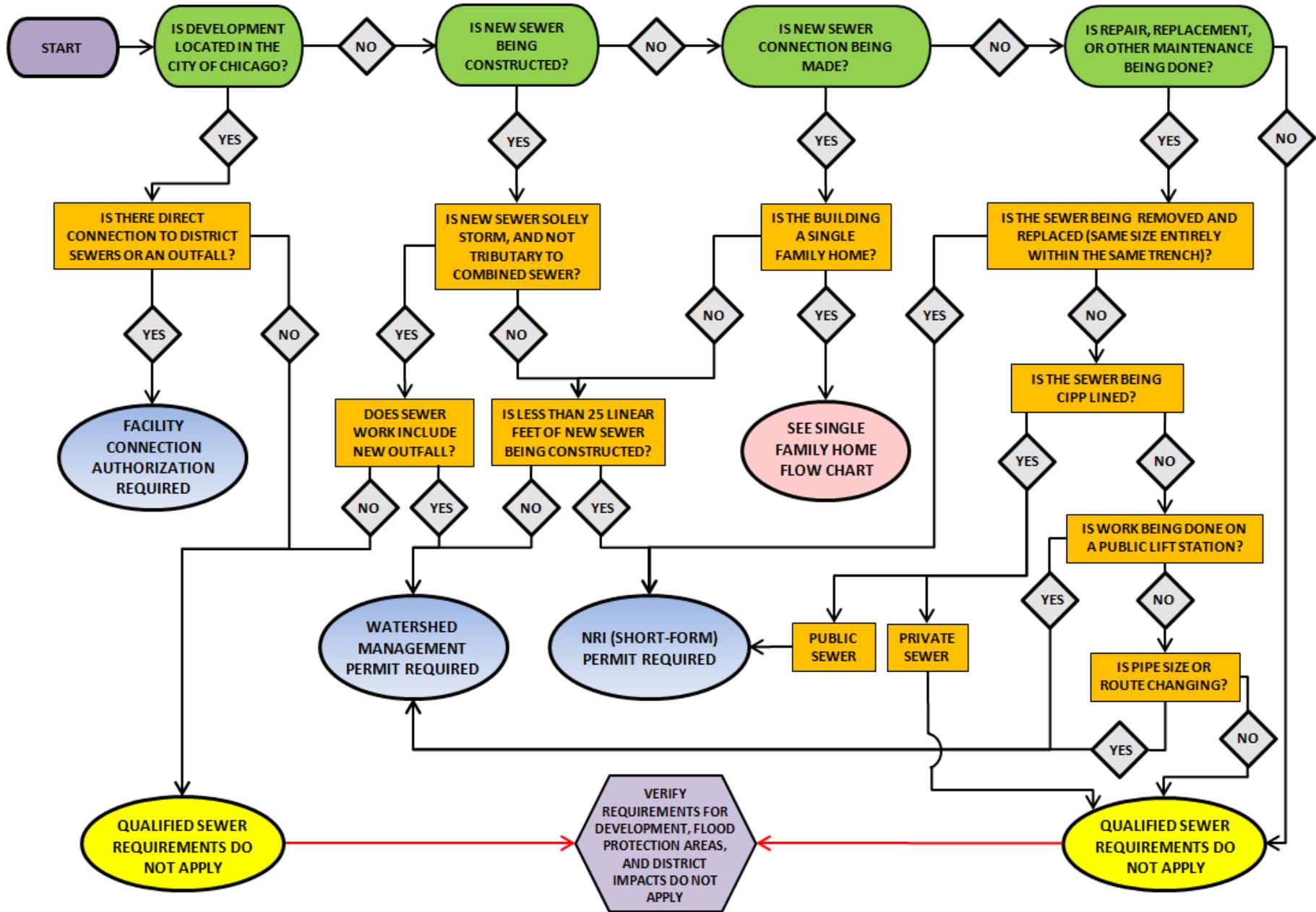
Technical Guidance Manual for the Implementation of the Watershed Management Ordinance

August 2015



- Ordinance
- Technical Guidance Manual
- Permit Forms
- Flow Charts
- Checklists

**METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO
QUALIFIED SEWER CONSTRUCTION* FLOW CHART**



*See definition of qualified sewer construction in Appendix A of the WMO.

Permit Applicability



Permit Applicability
§201, Table 1

Development
> 0.5 Disturbed
Area

Flood Protection
Areas
Floodplain, Wetlands,
Riparian etc.

Qualified Sewer
Construction

District
Impacts

Stormwater
Requirements
Article 5, Table 2
Ownership

Color Code:

"Cook County, ☉ Chicago

"District Corporate Limits, ☉ Chicago

"Cook County including Chicago

TARP / Interceptors
Waterway Outfalls
Lake Michigan
District Property

Table 2.			
Summary of Site Stormwater Management Requirements¹			
	§502	§503	§504
Development Type (See Appendix A for definitions)	Runoff Requirements	Volume Control Requirements²	Detention Requirements²
Single-Family Home	Exempt	Exempt	Exempt
Residential Subdivision	Parcels ≥ 1 acre	Parcels ≥ 1 acre	Parcels ≥ 5 acres
Multi-Family Residential	Parcels ≥ 0.5 acre	Parcels ≥ 0.5 acre	Parcels ≥ 3 acres †
Non-Residential	Parcels ≥ 0.5 acre	Parcels ≥ 0.5 acre	Parcels ≥ 3 acres †
Right-of-Way	New Impervious Area ≥ 1 acre	New Impervious Area ≥ 1 acre †	New Impervious Area ≥ 1 acre †
Open Space	Parcels ≥ 0.5 acre	Not Applicable	Not Applicable
<p>¹ Site stormwater management requirements are not required for maintenance activities as defined in Appendix A.</p> <p>² Requirements are applicable when a Watershed Management Permit is required under §201 of this Ordinance.</p> <p>† Where practicable.</p> <p>‡ Starting the effective date of this Ordinance, any new development on the parcel that totals either individually or in the aggregate to more than one-half (0.5) of an acre.</p>			



- Overview
- Cook County Stormwater Management Plan (CCSMP)
- Watershed Management Ordinance (WMO)**
- Inundation Maps & Hydraulic Profiles
- Stormwater Annual Reports and Publications
- Stormwater Master Plan Pilot Studies
- Watershed Planning Council
- WPC Meetings
- Combined Sewer Communities

Services & Facilities >> Stormwater Management >> Watershed Management Ordinance (WMO)

Watershed Management Ordinance

The Watershed Management Ordinance (WMO) establishes uniform, minimum, countywide stormwater management regulations throughout Cook County. Components which are regulated under the WMO include control, floodplain management, isolated wetland protection, riparian environment protection, and soil erosion and sediment control. The WMO went into effect on May 1, 2014 and the District's Board of Comm WMO on July 10, 2014. The WMO is accessible through the link below.

- » [WMO](#) (As amended on July 10, 2014 meeting) (7.2 MB)
- » [WMO Comparison Documents](#) (Compares changes from May 1, 2014 WMO to July 10, 2014 latest amendments) (6.08 MB)
- » [Article 8: Infiltration / Inflow Control Program](#) (Incorporated into WMO on July 10, 2014) (68.3 KB)

The District developed a Technical Guidance Manual (TGM), which will serve as a technical reference to the WMO. The TGM documents are accessible through the link below.

- » [Technical Guidance Manual \(TGM\)](#) (Updated September 2015)
- » [Appendix C. Standard Details & Notes](#) (Updated July 2015)

The District will conduct training for stakeholders to ease the transition from the Sewer Permit Ordinance to the WMO.

- » [Training Schedule](#)

Permit Resources:

- » [Information Pamphlets for Developers and Homeowners](#)
- » [Watershed Management Permit Flow Charts, Checklist and Forms](#)
- » [Minimum Permit Submittal Checklist](#) (184 KB)
- » [WMO Design Calculators](#)
- » [WMO Model Templates](#)
- » [Authorized Municipalities and Multi-County Municipalities](#)

Other Resources:

- » [Watershed Management Ordinance: Short Summary](#)
- » [Permit Inquiries \(Request Copies of Past Issued Permits\)](#)
- » [Permit Revision Information](#)
- » [Existing Development Plans List](#)
- » [Frequently Asked Questions \(FAQs\)](#)

wmo.mwrd.org



Managing Stormwater

The WMO aims to protect public health, safety, and welfare, and Cook County homes and businesses from flood damage by managing and mitigating the effects of development and redevelopment on stormwater drainage. It provides uniform minimum stormwater management regulations for Cook County that are consistent with the region.

The WMO replaces the MWRD's repealed Sewer Permit Ordinance (SPO). WMO permit requirements are more comprehensive than those of the SPO.

How it Works

The WMO establishes rules and guidelines for development to ensure that flooding problems are not exacerbated. Permits are required prior to start of construction for new projects as described inside.

Single Family Homes

The WMO was not intended to regulate most single family homes. When a new development is located in or near a Flood Protection Area, a permit may be required. See "WMO: A Quick Guide for Homeowners" and the WMO.

For More Information

please visit wmo.mwrld.org
or contact the MWRD at 312.751.3255
or WMOInbox@mwrld.org

WMO: A Quick Guide for Developers

This pamphlet is an introduction for developers to the requirements and permit compliance process of the Metropolitan Water Reclamation District of Greater Chicago's Watershed Management Ordinance.



Metropolitan Water Reclamation
District of Greater Chicago

Board of Commissioners

Meriyana T. Spyropoulos
President

Barbara J. McGowan
Vice President

Frank Avila
Chairman of Finance

Michael A. Alvarez

Timothy Bradford

Cynthia M. Santos

Debra Shore

Kari K. Steele

David J. Walsh

David St. Pierre
Executive Director

  mwrld.org

Metropolitan Water Reclamation
District of Greater Chicago

A Quick Guide for Developers



**Watershed
Management
Ordinance**

WMO Informational Brochure

Managing Stormwater

The WMO aims to protect public health, safety, and welfare, and Cook County homes and businesses from flood damage by managing and mitigating the effects of development and redevelopment on stormwater drainage. It provides uniform minimum stormwater management regulations for Cook County that are consistent with the region.

The WMO replaces the MWRD's repealed Sewer Permit Ordinance (SPO). WMO permit requirements are more comprehensive than those of the SPO.

Single Family Homes

The WMO is not intended to regulate most single family homes. A permit is generally only required for single family home development that involves a Flood Protection Area or requires an extension of a public sewer to serve the parcel. These types of development are regulated under the WMO because they can have a significant potential for loss of property from flood drainage. Unlike residential subdivisions, single family home developments are exempt from the stormwater provisions of the WMO.

The WMO defines a "single family home" as a residential parcel containing less than 3 dwelling units. This does not include single family home parcels subdivided after May 1, 2014.

For More Information

please visit wmo.mwrdd.org
or contact the MWRD at 312.751.3255
or WMOinbox@mwrdd.org

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Metropolitan Water Reclamation
District of Greater Chicago

A Quick Guide for Homeowners



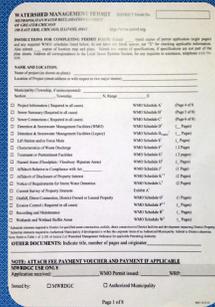
**Watershed
Management
Ordinance**

WMO Informational Brochure



When to Apply

Past contractor expectations:



Design Project

Mobilize

Substantial Completion

Apply for MWRD Permit

MWRD Inspect

Obtain Permit

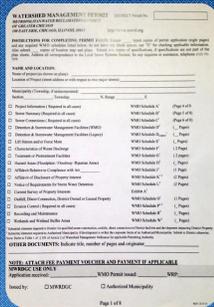
Occupancy





When to Apply

Early coordination needed with new regulations



Design Project

Apply for MWRD Permit

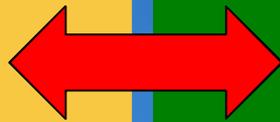
Obtain Permit

**Mobilize
"MWRD Erosion Inspection**

**Sewer Work
"MWRD Inspect**

**Substantial Completion
"MWRD Inspect**

Occupancy





Permit Review Time

“ Per Ordinance § 1401:2

- . 15 working days outside FPA
- . 30 working days inside FPA
- . 10 working days for resubmittal

“ 3 year approved permit life

- . 1 year to start construction
- . Extensions to construction start may be granted upon request
- . 3 years total to finish

“ Stagnant permits now canceled quarterly

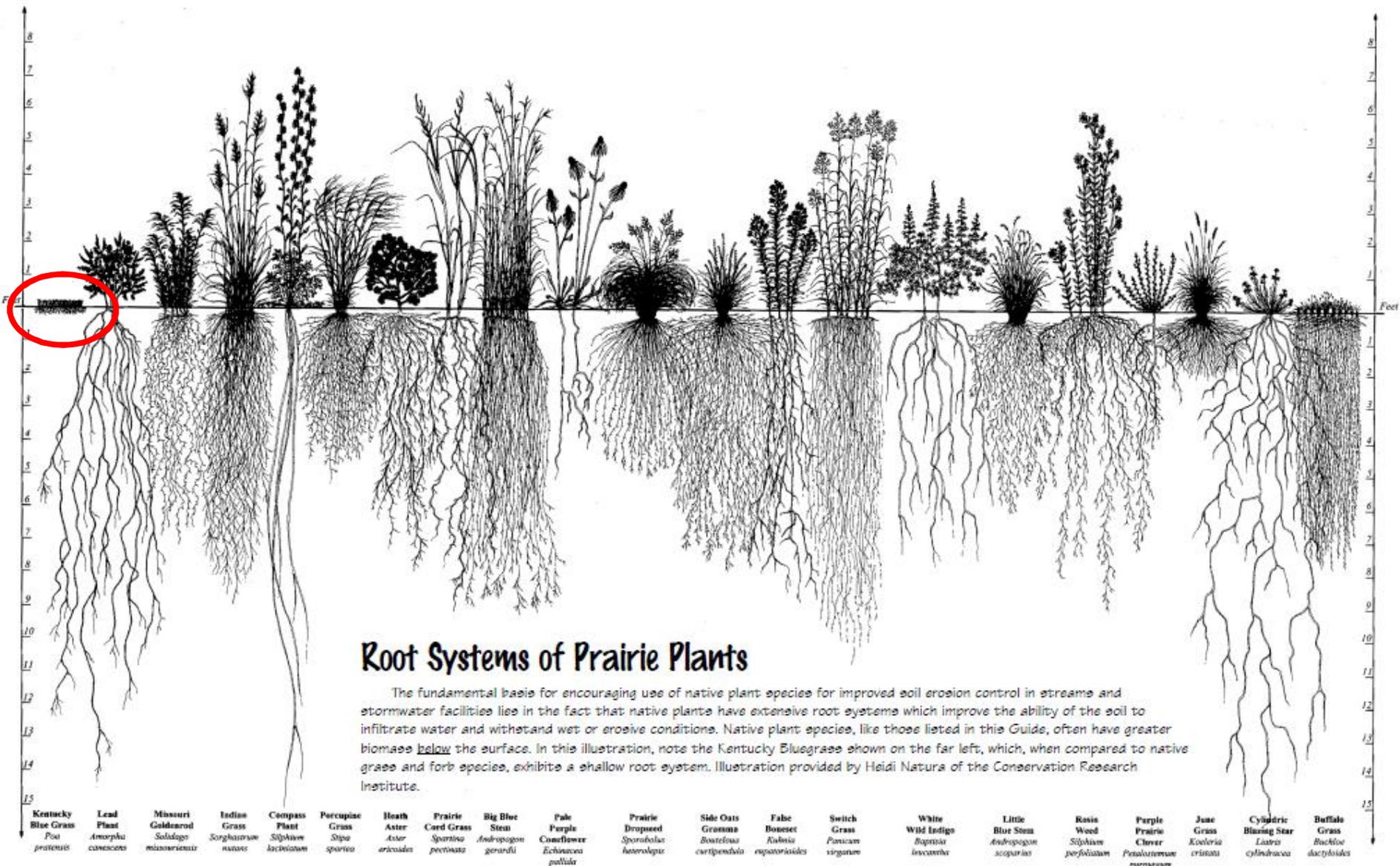
- . Applications cannot remain open indefinitely
- . 90 days no resubmittal = 30 day deadline to respond with schedule
- . MWRD is reasonable, but be certain to respond in a letter





Green Infrastructure (GI) = Volume Control (VC) (in WMO)





Root Systems of Prairie Plants

The fundamental basis for encouraging use of native plant species for improved soil erosion control in streams and stormwater facilities lies in the fact that native plants have extensive root systems which improve the ability of the soil to infiltrate water and withstand wet or erosive conditions. Native plant species, like those listed in this Guide, often have greater biomass below the surface. In this illustration, note the Kentucky Bluegrass shown on the far left, which, when compared to native grass and forb species, exhibits a shallow root system. Illustration provided by Heidi Natura of the Conservation Research Institute.

- Kentucky Blue Grass
Poa pratensis
- Lead Plant
Amorpha canescens
- Missouri Goldenrod
Solidago missouriensis
- Indian Grass
Sorghastrum nutans
- Compass Plant
Silphium laciniatum
- Percupine Grass
Stipa spirea
- Heath Aster
Aster ericoides
- Prairie Cord Grass
Spartina pectinata
- Big Blue Stem
Andropogon gerardii
- Pale Purple Coneflower
Echinacea purpurea
- Prairie Dropseed
Sporobolus heterolepis
- Side Oats Gramma
Bouteloua curtipendula
- False Boneset
Rubus cuneifolius
- Switch Grass
Panicum virgatum
- White Wild Indigo
Baptisia leucantha
- Little Blue Stem
Andropogon scoparius
- Rosin Weed
Silphium perfoliatum
- Purple Prairie Clover
Petalostemum purpureum
- June Grass
Koeleria cristata
- Cylindric Blazing Star
Liatris cylindracea
- Buffalo Grass
Bouteloua dactyloides

Root Systems: Turf Grass to Native Plants



[Appendix C. Standard Details & Notes \(29 MB\) \(Updated July 2015\)](#)

Volume Control Details

Bioretention Facility	PDF	DWG
Bioswale (Must be used with Check Dam)	PDF	DWG
Bioswale Check Dam	PDF	DWG
Constructed Wetlands	PDF	DWG
Drywell	PDF	DWG
Green Roof	PDF	DWG
Infiltration Trench	PDF	DWG
Lake Michigan Outfall Water Quality Device	PDF	DWG
Observation Well	PDF	DWG
Permeable Pavers	PDF	DWG
Rain Cistern/Water Reuse System	PDF	DWG
Removable Hood for Catch Basin and Water Quality Structures	PDF	DWG
Sediment Forebay/Pretreatment Basin	PDF	DWG
Signage for Permeable Pavement	PDF	
Storage Below Outlet of Detention Basin	PDF	DWG
Vegetated Filter Strip (Flow-Through)	PDF	DWG
Volume Control Pretreatment Measures	PDF	DWG
Volume Control Storage Matrix	PDF	DWG

General Notes and Exhibits

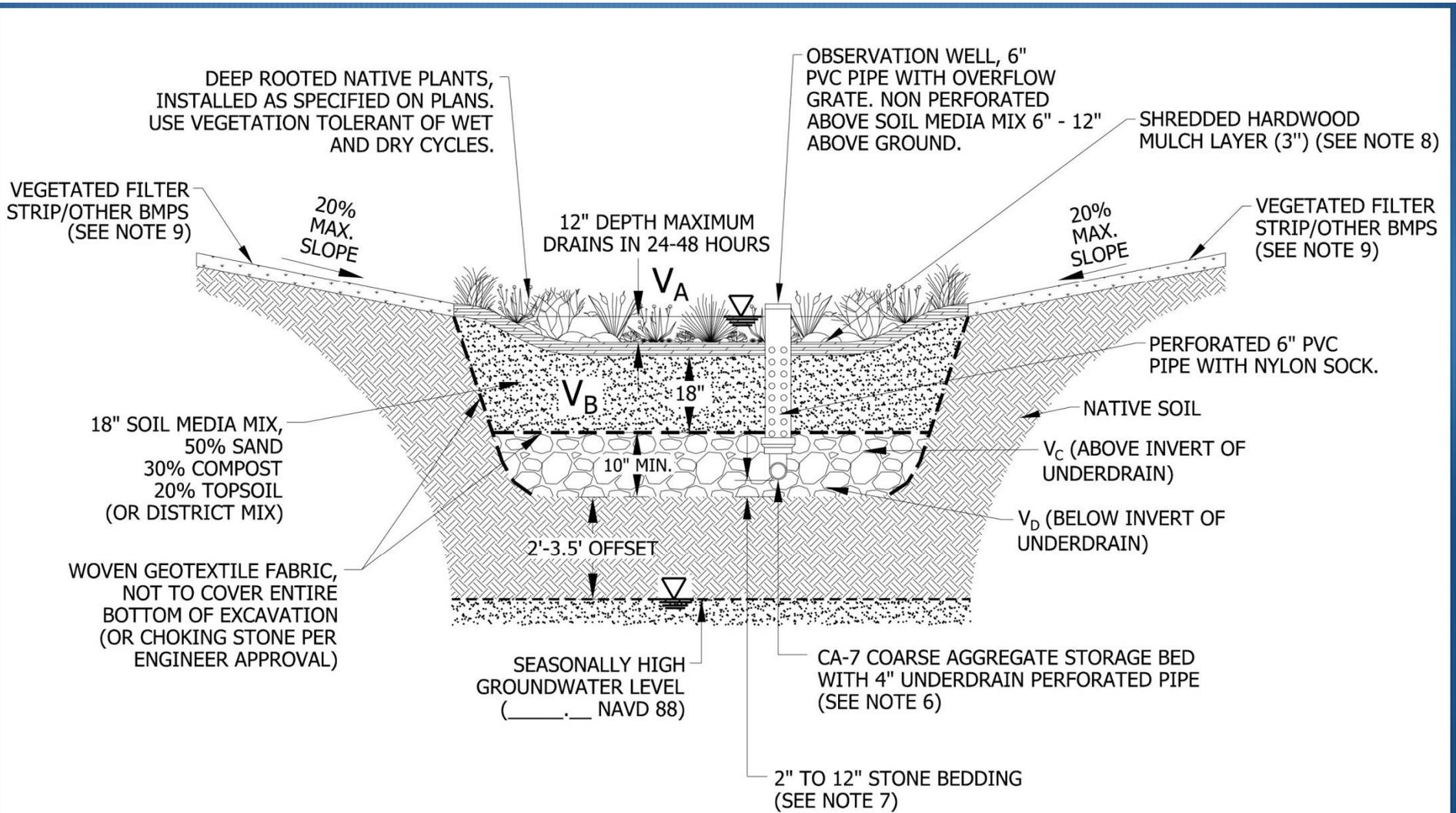
MWRD General Notes	PDF	DWG
Example Drainage Exhibit	PDF	DWG
Example Exhibit R	PDF	DWG
Example Routing Exhibit	PDF	DWG

Stormwater and Floodplain Details

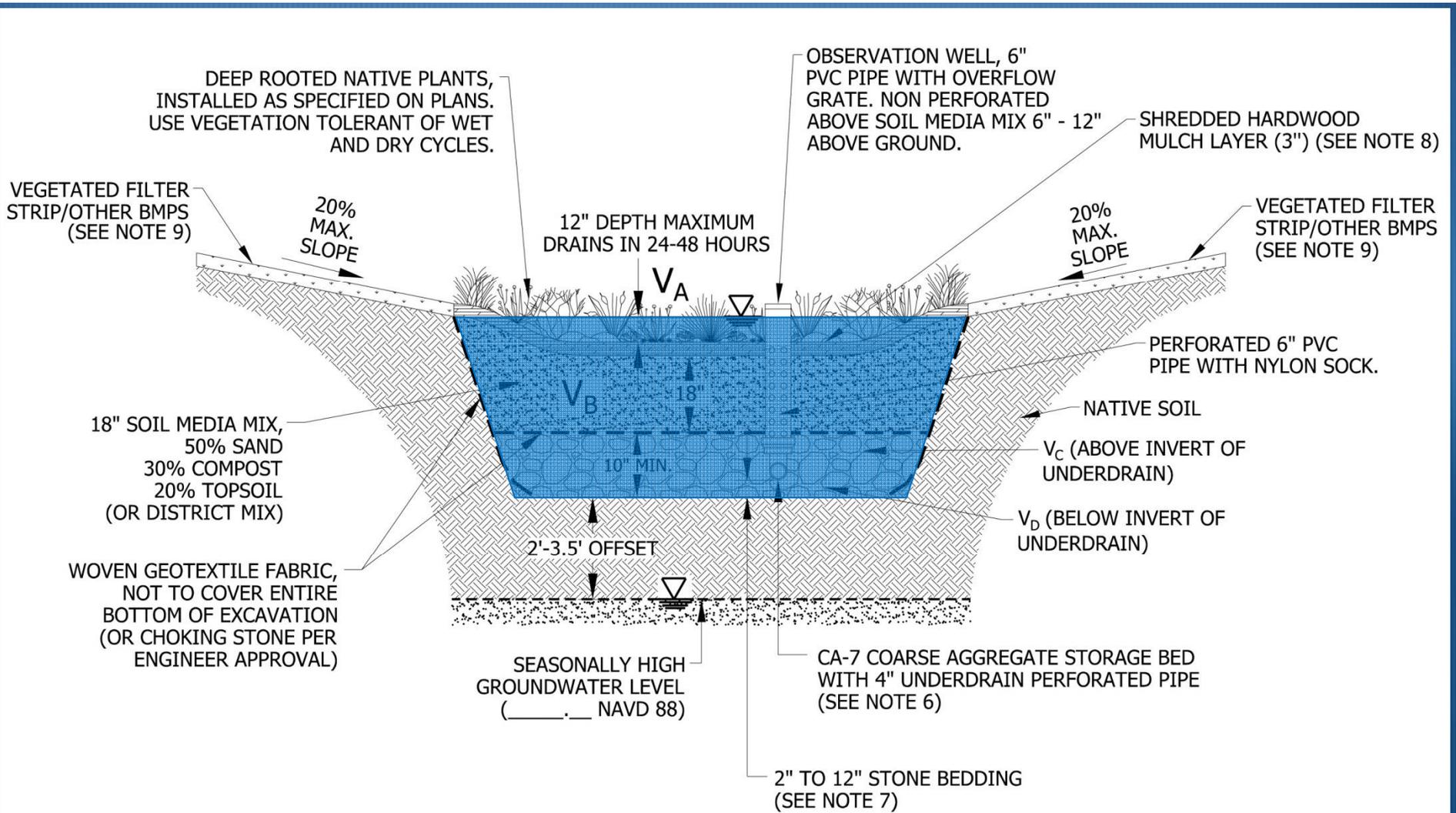
Emergency Overflow Weir	PDF	DWG
Floodplain Garage	PDF	DWG
Outlet Control Structure (Plate)	PDF	DWG
Outlet Control Structure (Wall)	PDF	DWG
Parking Lot Detention	PDF	DWG
Signage for Parking Lot Detention	PDF	
Vortex Restrictor	PDF	DWG
Window Well	PDF	DWG

Sanitary Sewer Details

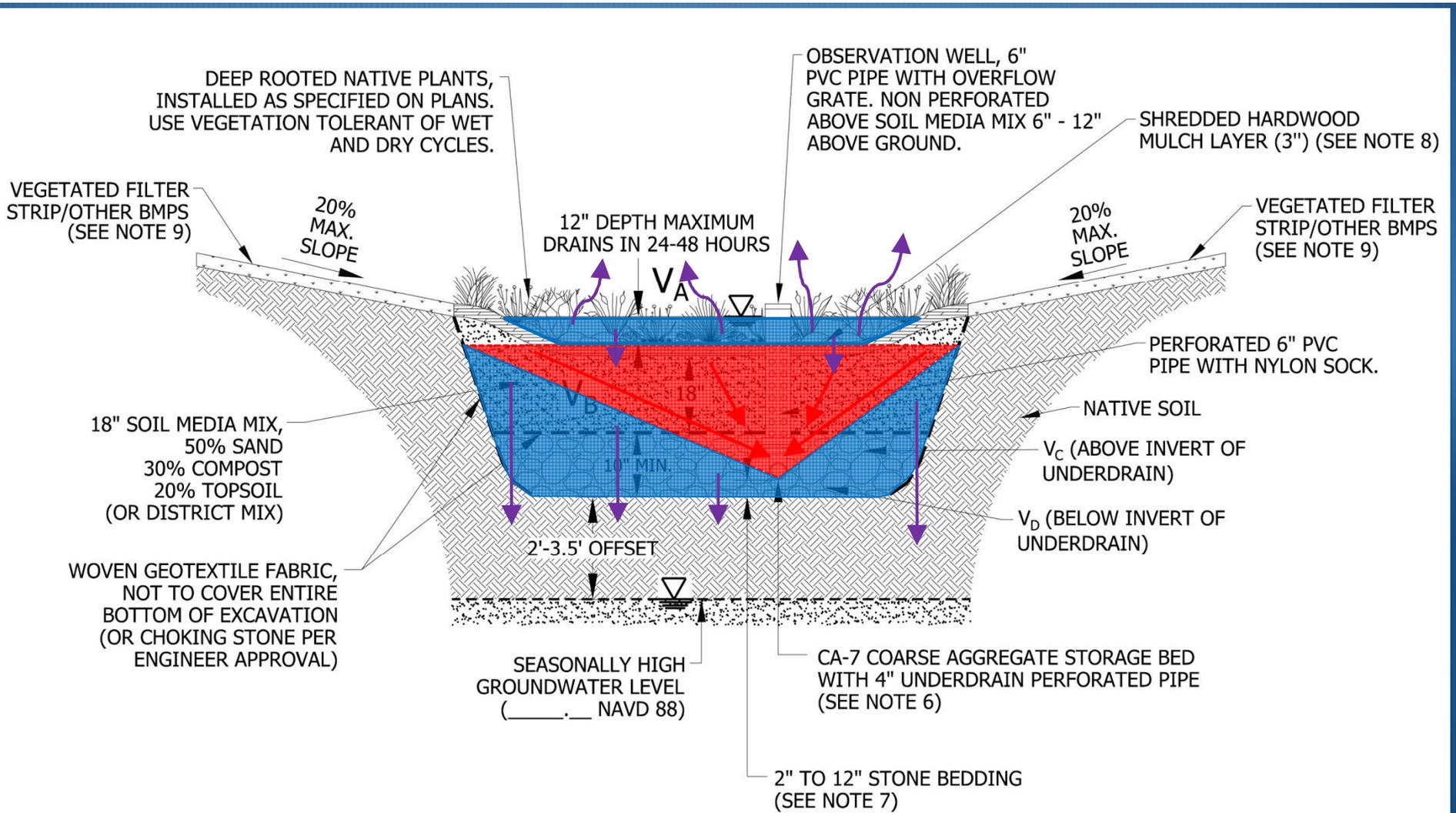
Concrete Cradle	PDF	DWG
Concrete Encasement	PDF	DWG
Dog House Manhole	PDF	DWG
Drop Manhole Connection	PDF	DWG
Rigid And Flexible Pipe Installation	PDF	DWG
Forcemain Discharge to Gravity Manhole	PDF	DWG
Large Grease Basin	PDF	DWG
Methods for Connecting to MWRD Manholes	PDF	DWG
Riser for Sanitary Service Lateral	PDF	DWG
Sanitary Manhole Type A and B	PDF	DWG
Small Grease Basin	PDF	DWG
Water Separation Requirements	PDF	DWG



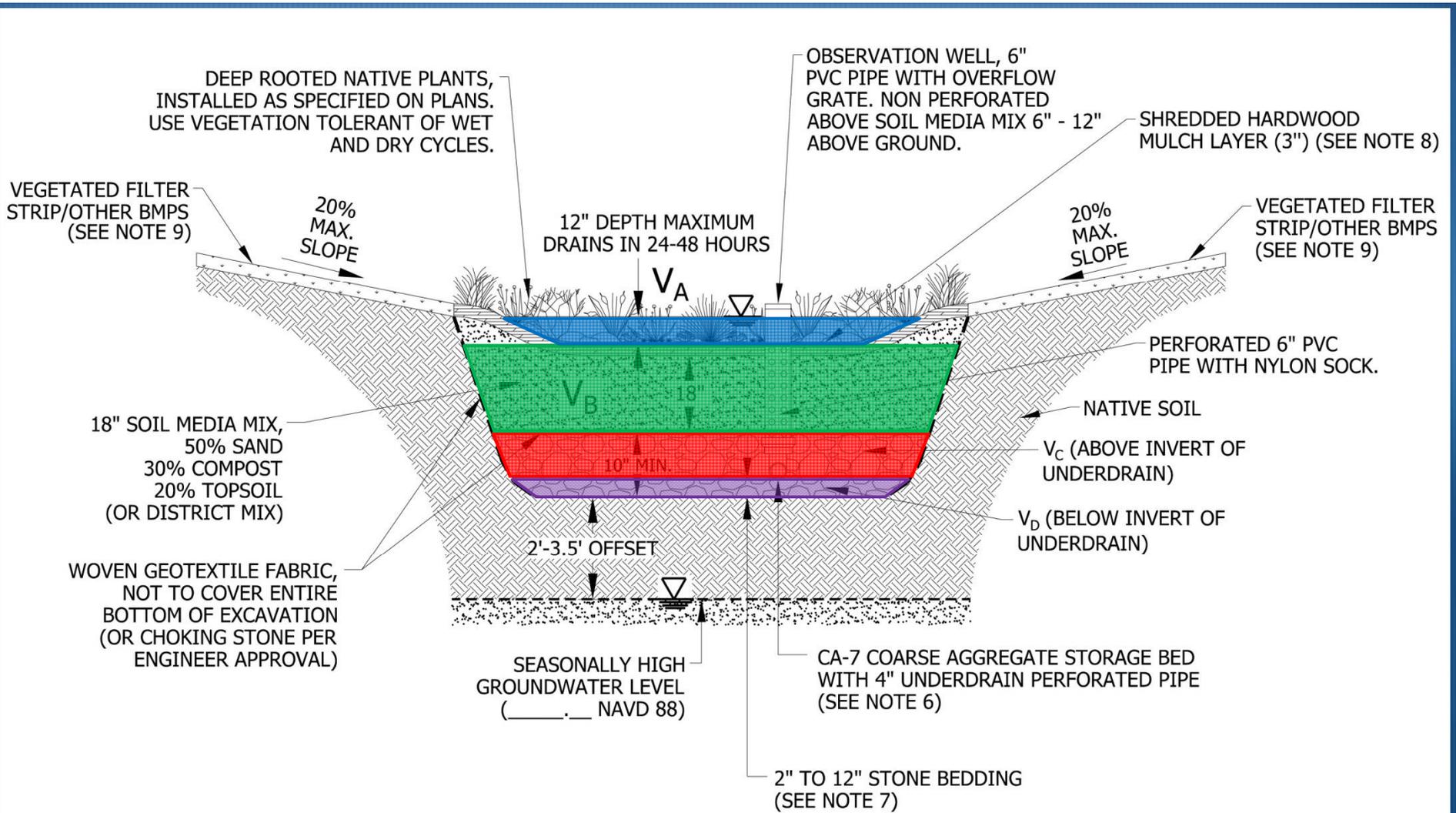
VOLUME TYPE	POROSITY	MEDIA VOLUME	STORAGE VOLUME	VOLUME PROVIDED
SURFACE STORAGE	1.00	V _A	1.00 x V _A	
SOIL MEDIA MIX	0.25	V _B	0.5 x 0.25 x V _B	
COARSE AGG. (ABOVE INVERT)	0.36	V _C	0.5 x 0.36 x V _C	
COARSE AGG. (BELOW INVERT)	0.36	V _D	0.36 x V _D	
			TOTAL	



VOLUME TYPE	POROSITY	MEDIA VOLUME	STORAGE VOLUME	VOLUME PROVIDED
SURFACE STORAGE	1.00	V _A	1.00 x V _A	
SOIL MEDIA MIX	0.25	V _B	0.5 x 0.25 x V _B	
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TOTAL				



VOLUME TYPE	POROSITY	MEDIA VOLUME	STORAGE VOLUME	VOLUME PROVIDED
SURFACE STORAGE	1.00	V_A	$1.00 \times V_A$	
SOIL MEDIA MIX	0.25	V_B	$0.5 \times 0.25 \times V_B$	
COARSE AGG. (ABOVE INVERT)	0.36	V_C	$0.5 \times 0.36 \times V_C$	
COARSE AGG. (BELOW INVERT)	0.36	V_D	$0.36 \times V_D$	
			TOTAL	



VOLUME TYPE	POROSITY	MEDIA VOLUME	STORAGE VOLUME	VOLUME PROVIDED
SURFACE STORAGE	1.00	V_A	$1.00 \times V_A$	
SOIL MEDIA MIX	0.25	V_B	$0.5 \times 0.25 \times V_B$	
COARSE AGG. (ABOVE INVERT)	0.36	V_C	$0.5 \times 0.36 \times V_C$	
COARSE AGG. (BELOW INVERT)	0.36	V_D	$0.36 \times V_D$	
			TOTAL	





Does an existing conventional wet pond satisfy Volume Control for new Development?

Short answer: **No**



- “ Is there a new stormwater benefit created?
- “ Existing systems can be planned for retrofit, **permitted**, and improved to serve new areas

Volume Control Detention Retrofit

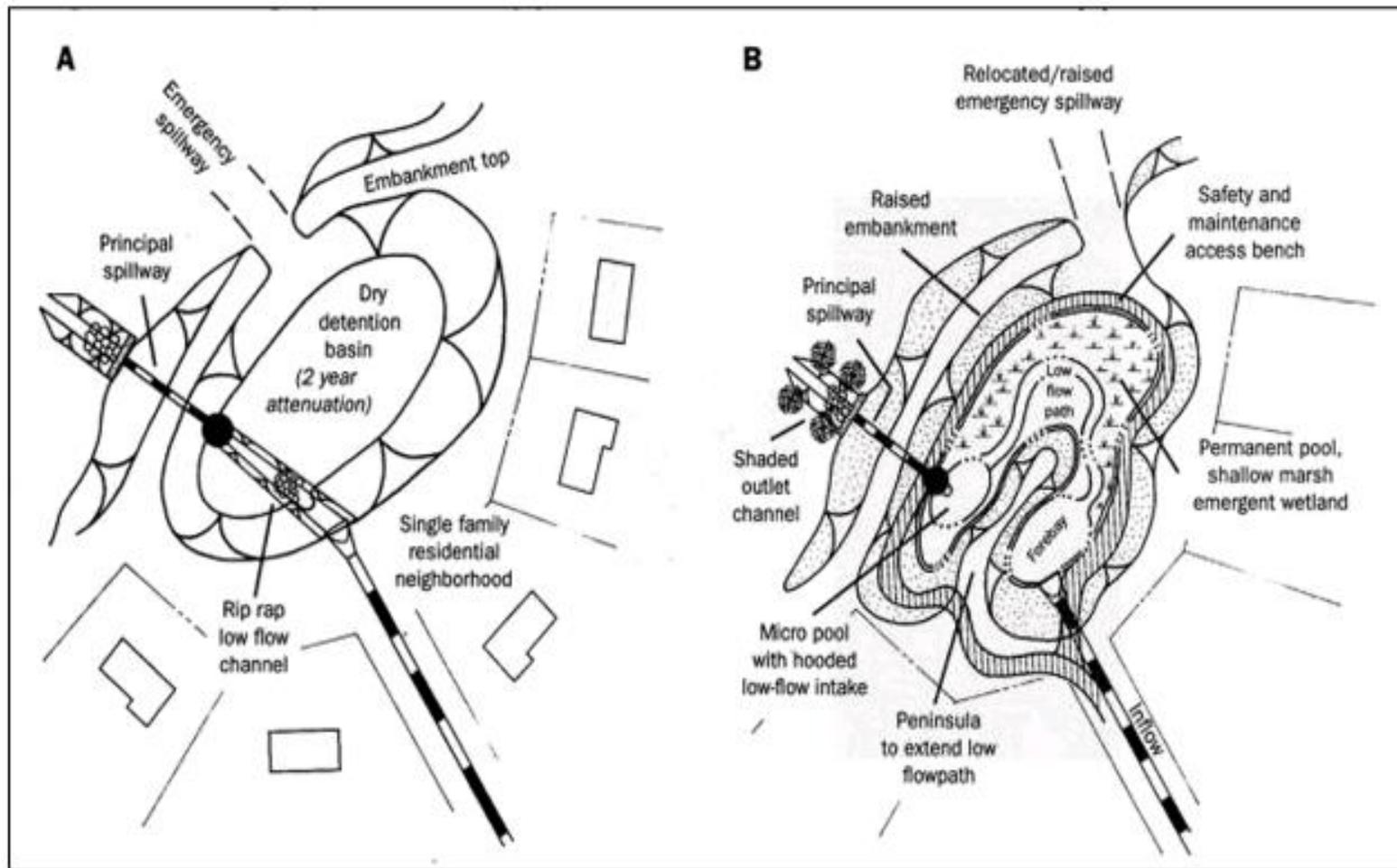


Figure 8: Schematic showing conversion of a dry pond to a shallow marsh

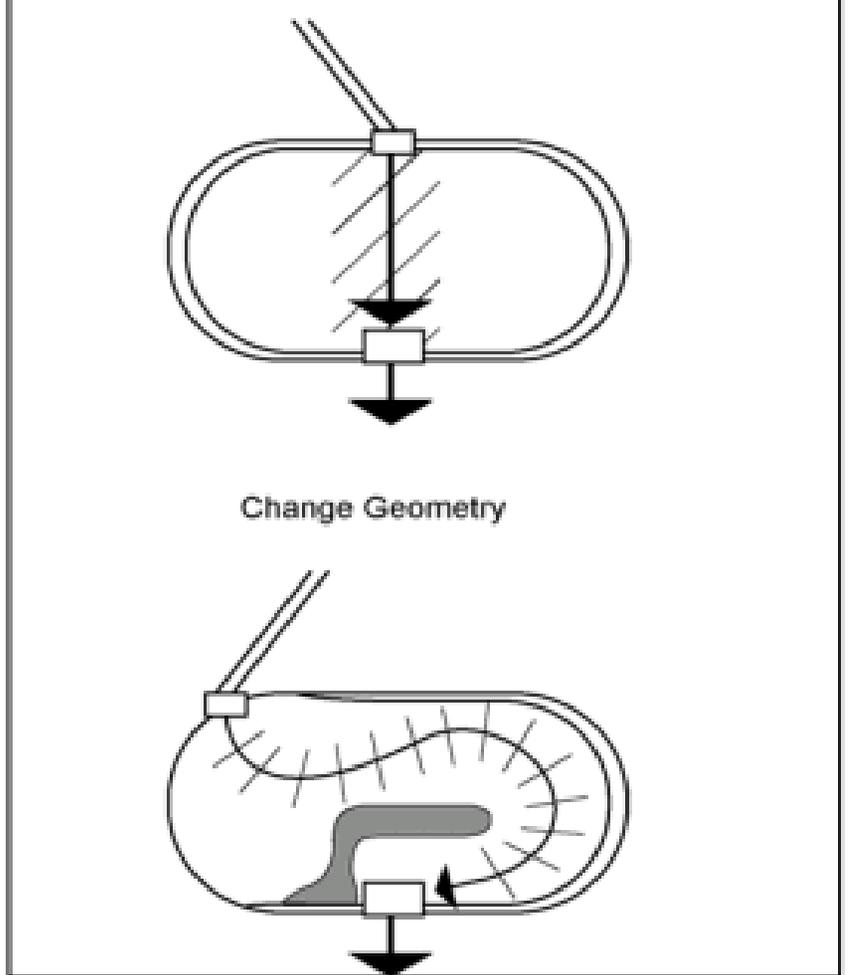
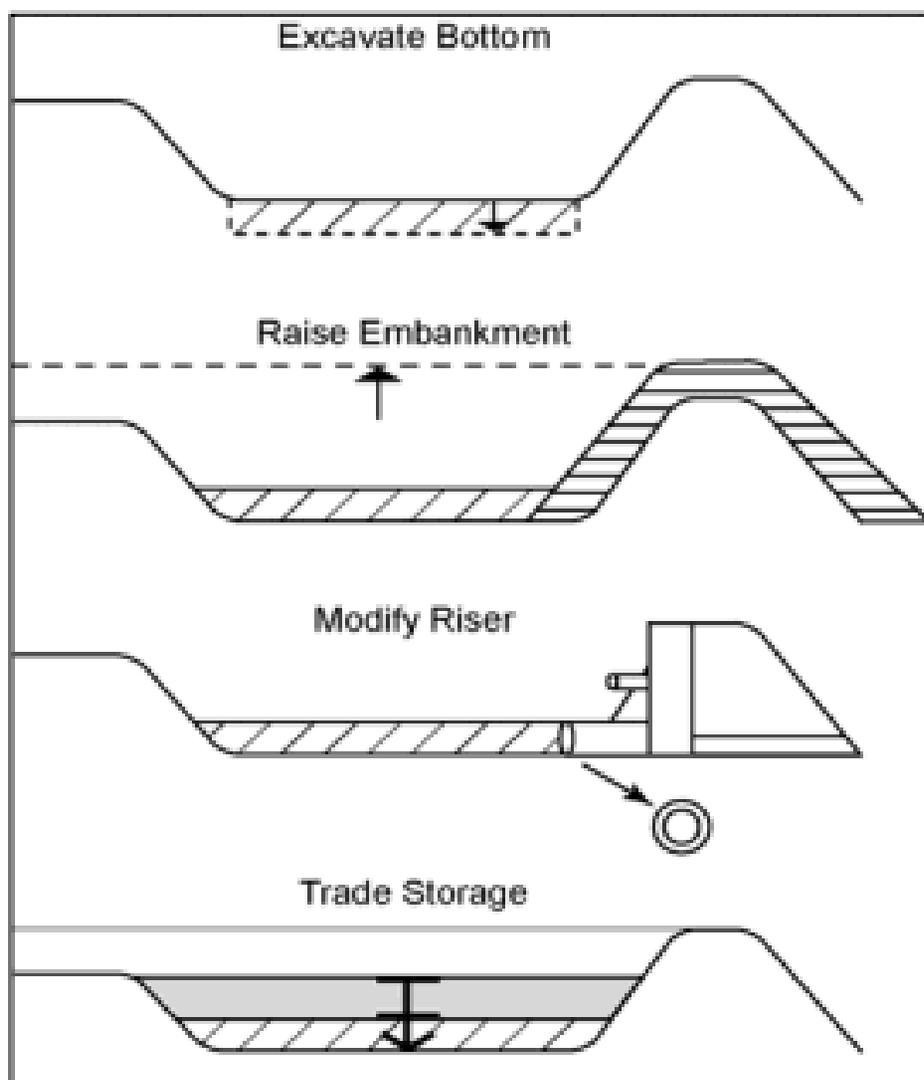


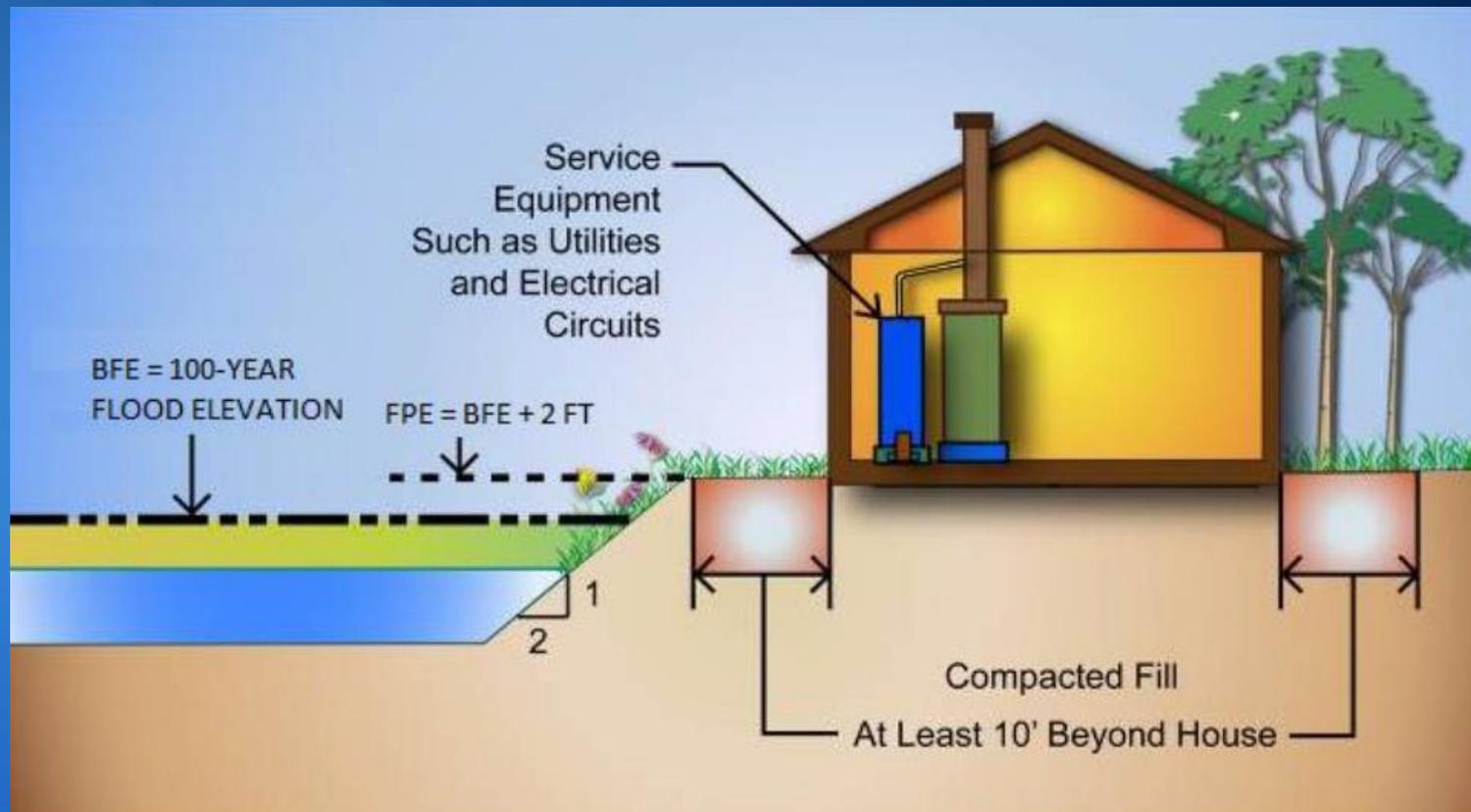
Figure 1: Five strategies to retrofit a pond

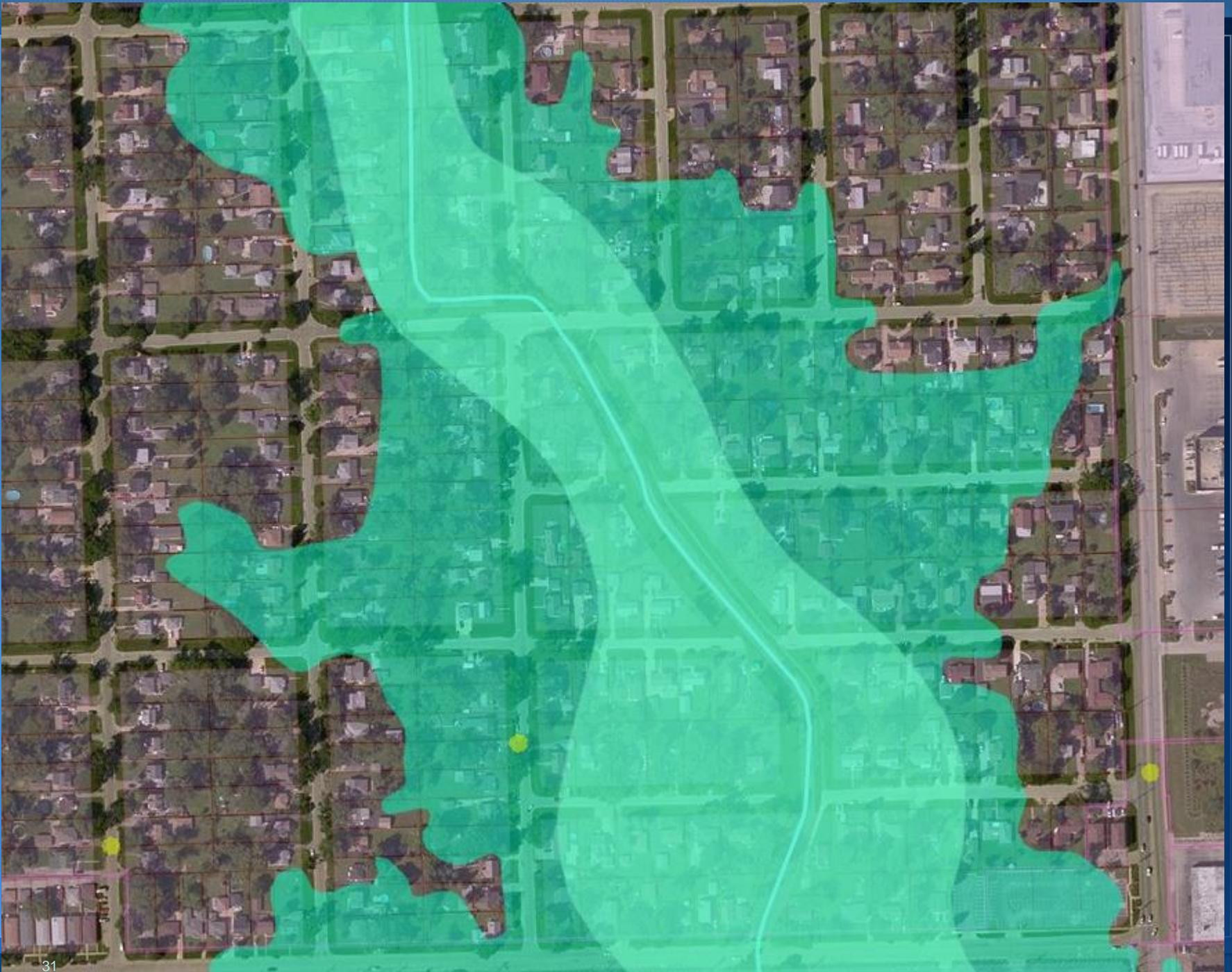
Floodplain



” Flood Protection Elevation

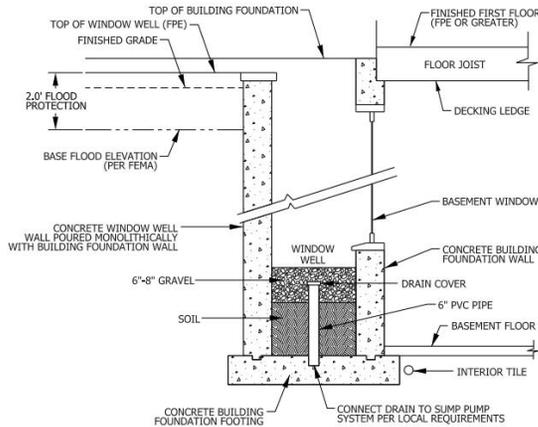
- $FPE = BFE + 2 \text{ feet}$





Single Family Home SFHA Short Permit Form (Jan 2015)

New Window Well Detail



- NOTE:
1. FINISHED FIRST FLOOR AND LOW-ENTRY ELEVATIONS MUST BE ELEVATED AT LEAST TWO FEET ABOVE BASE FLOOD ELEVATION (BFE) PER FEMA.
 2. LOWEST ADJACENT GRADE TO FOUNDATION MUST BE ELEVATED TO AT LEAST THE BFE AND EXTEND A MINIMUM OF 20 FEET BEYOND OUTSIDE FACE OF BUILDING.
 3. CHECK BUILDING/FIRE CODE FOR EGRESS WINDOW REQUIREMENTS.
- NOT TO SCALE



TECHNICAL GUIDANCE MANUAL

7/1/15

TYPICAL WINDOW WELL DETAIL

STD. DWG. NO. 29

PAGE NO. 30

Watershed Management Permit No.

SINGLE FAMILY HOME - SPECIAL FLOOD HAZARD AREA (SFHA) PERMIT FORM WATERSHED MANAGEMENT ORDINANCE §602

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO
111 EAST ERIE STREET, CHICAGO, ILLINOIS 60611
312-751-3260

1. PROJECT INFORMATION New Construction Foundation Expansion

Project Name: _____
Description of Project: _____
Street Address of Project: _____
Municipality (Township, if unincorporated): _____
Parcel Area: _____ acres Related MWRD Sewer Permit and/or Watershed Management Permit Number, if known: _____

2. SPECIAL FLOOD HAZARD AREA (SFHA) INFORMATION

Provide the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Panel number(s) and Map Revised date(s) for the single family home parcel: _____

Based on the most current FEMA FIRM, check all conditions that apply:

- Parcel is within 100 feet of Zone A (unstudied) floodplain
 Parcel is within 100 feet of Zone AE (defined) floodplain
 Parcel contains regulatory floodway

Provide a copy of the FEMA FIRM showing the boundary of the single family home parcel.

3. BASE FLOOD ELEVATION (BFE)

BFE (rounded to nearest tenth of a foot): _____ ft, NAVD88 Waterway: _____

List the source of the BFE for the subject parcel:

- Cook County Flood Insurance Study (FIS)
 MWRD Detailed Watershed Plan study
 Project-Specific Floodplain Study

Provide the profile for the BFE source listed above.

4. SINGLE FAMILY HOME ELEVATION (MUST BE 2 FEET ABOVE BFE)

Provide the lowest floor elevation for the proposed single family home (rounded to nearest tenth of a foot): _____ ft, NAVD88

Provide the lowest entry elevation for the proposed single family home (rounded to nearest tenth of a foot): _____ ft, NAVD88

Provide an exhibit showing the BFE clearly delineated on site-specific topography for the subject parcel, along with the lowest floor and lowest entry elevation shown for the proposed single family home. If applicable, show limits of regulatory floodway on the subject parcel.

5. COMPENSATORY STORAGE (EQUAL TO AT LEAST 1.1 TIMES VOLUME LOST BELOW BFE)

Floodplain Fill (cubic feet)	Compensatory Storage Provided (cubic feet)
0 - 10 Year	0 - 10 Year*
10 - 100-Year	10 - 100-Year*
0 Total	0 Total**

*Must be at least 1.0 times the floodplain fill ** Must be at least 1.1 times the floodplain fill

6. CERTIFICATION BY PROFESSIONAL ENGINEER OR PROFESSIONAL LAND SURVEYOR

This application and the drawings, together with other data in this application, have been examined by me and are found to be in compliance with all applicable regulations contained within the Watershed Management Ordinance.

Certified by: Municipality Design Engineer

Name: _____ Title: _____

Municipality or Engineering Firm: _____

Address: _____ Zip: _____

Signature: _____ Date: _____ Phone: _____



7. PERMITTEE (MUNICIPALITY)

This project is considered a substantial improvement.

Address: _____

Zip: _____

Name: _____

Title: _____

Signature: _____

Date: _____ Phone: _____

8. CO-PERMITTEE (PROPERTY OWNER)

Address: _____

Zip: _____

Name: _____

Title: _____

Signature: _____

Date: _____ Phone: _____

7.9 MG of Required
Volume Control =
90 Miles of Rain Barrels
Chicago to Milwaukee

30.5 MG of Required
Compensatory Storage =
350 Miles of Rain Barrels
Chicago to Cleveland

102 MG of Required
Detention =
1,200 Miles of Rain Barrels
Chicago to Disney World



2015 WMO Volume Results



How Large is the Thornton Composite Reservoir?



Typical
55 gallon
rain barrel



The TCR will be able to store 7.9 billion gallons of CSO or the equivalent to 144 million rain barrels — enough to circle the earth 3.64 times when laid end to end!



WMO Prospective Schedule 2016

- “ Ongoing Advisory Committee Meetings
Discuss further permitting improvements

- “ Watershed Specific Release Rate Study
 - “ Contracted with Illinois State Water Survey
 - “ Ongoing QA/QC of DWP Models
 - “ Phase 1 Results, end of 2016
Pilot Areas: Uppers Salt and Stony Creek

- “ Improve and shorten permit forms and paperwork
 - “ 2 copies of permits



Thank you Questions

Dan Feltes, P.E., CFM

Daniel.Feltes@mwr.org

Metropolitan Water Reclamation District of Greater Chicago

100 E. Erie Street
Chicago, Illinois