

# Watershed Management Ordinance



**Resilient Chicago**  
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## **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

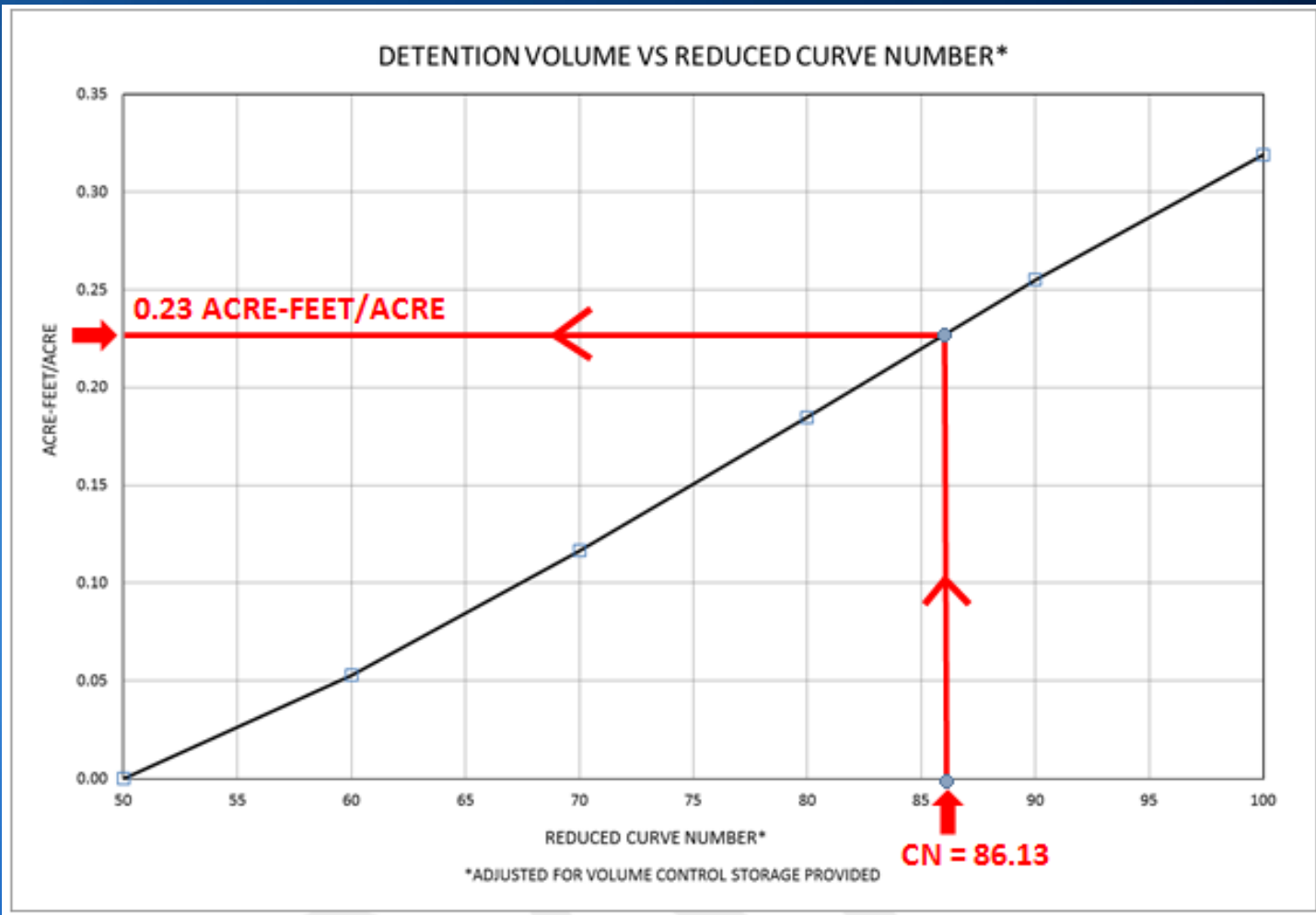
- Sanitary Sewers
- Stormwater Detention
  - Bulletin-70 Rainfall Data
  - Flat Release Rate
  - Hydrograph Method
- Volume Control
- Erosion & Sediment
- Flood Protection Areas
  - Floodplain
  - Floodway
  - Isolated Wetlands
  - Riparian Areas



# Stormwater Detention

- **Bulletin 70 Rainfall Data**
- **Methodology**
  - Hydrograph Method
  - Nomograph
- **Release Rate**
  - **First five years of implementation**
    - *0.30 cfs/acre*
    - *Historical release rate*
  - **After five years**
    - *Watershed specific release rates*

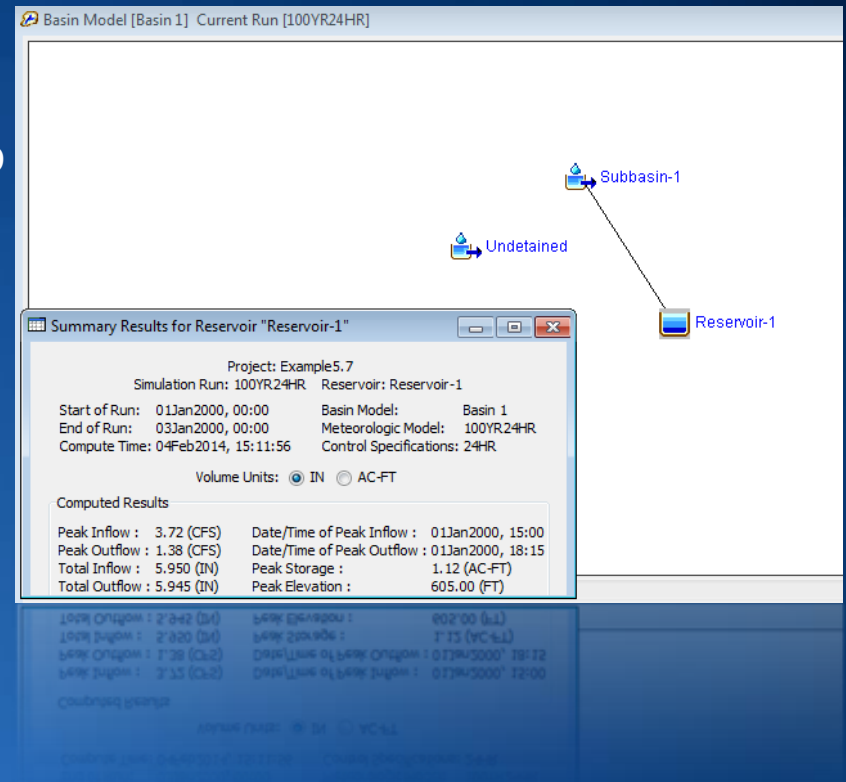
# Nomograph Method





# Template Hydrologic Models

- MWRD to provide setup inputs:
  - Bulletin 70 Rainfall Data
  - Huff Quartile Rainfall Distributions
  - Single Reservoir Routing Scenario
- Templates expected:
  - HEC-HMS
  - TR-20
  - WIN TR-20
- Download from Website

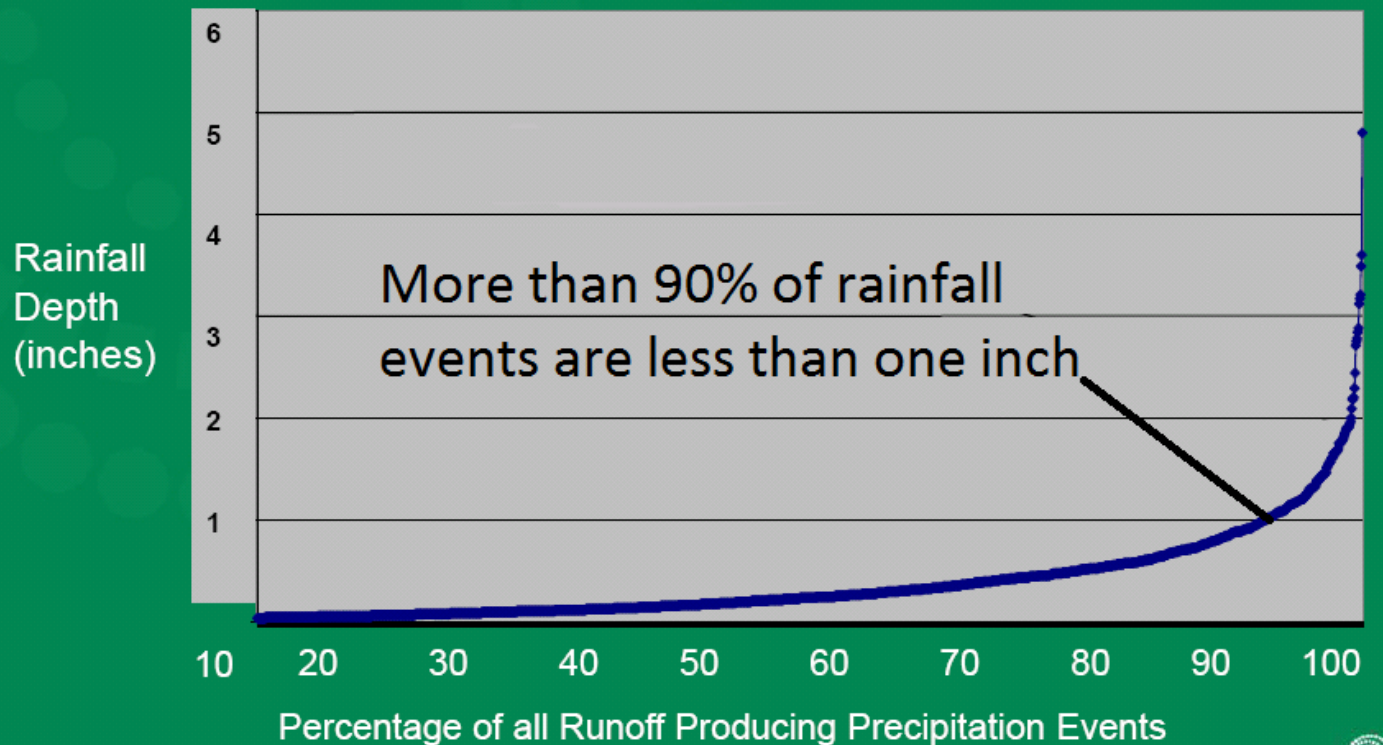


# Volume Control



- One inch capture from impervious area

## Chicago Rainfall Statistics





# WMO Volume Control Summary

- One inch of volume over total new impervious area
- Can be provided in several ways:
  - Infiltration Trenches
  - Infiltration Basins
  - Porous Pavement (storage in the voids below the pavement)
  - Bio-Retention Systems
  - Dry Wells
  - Cisterns
  - Open Channel Practices Fitted With Check Dams
  - Storage Below the Outlet of a Site Detention Facility
- Credit toward required detention volume (CN reduction)





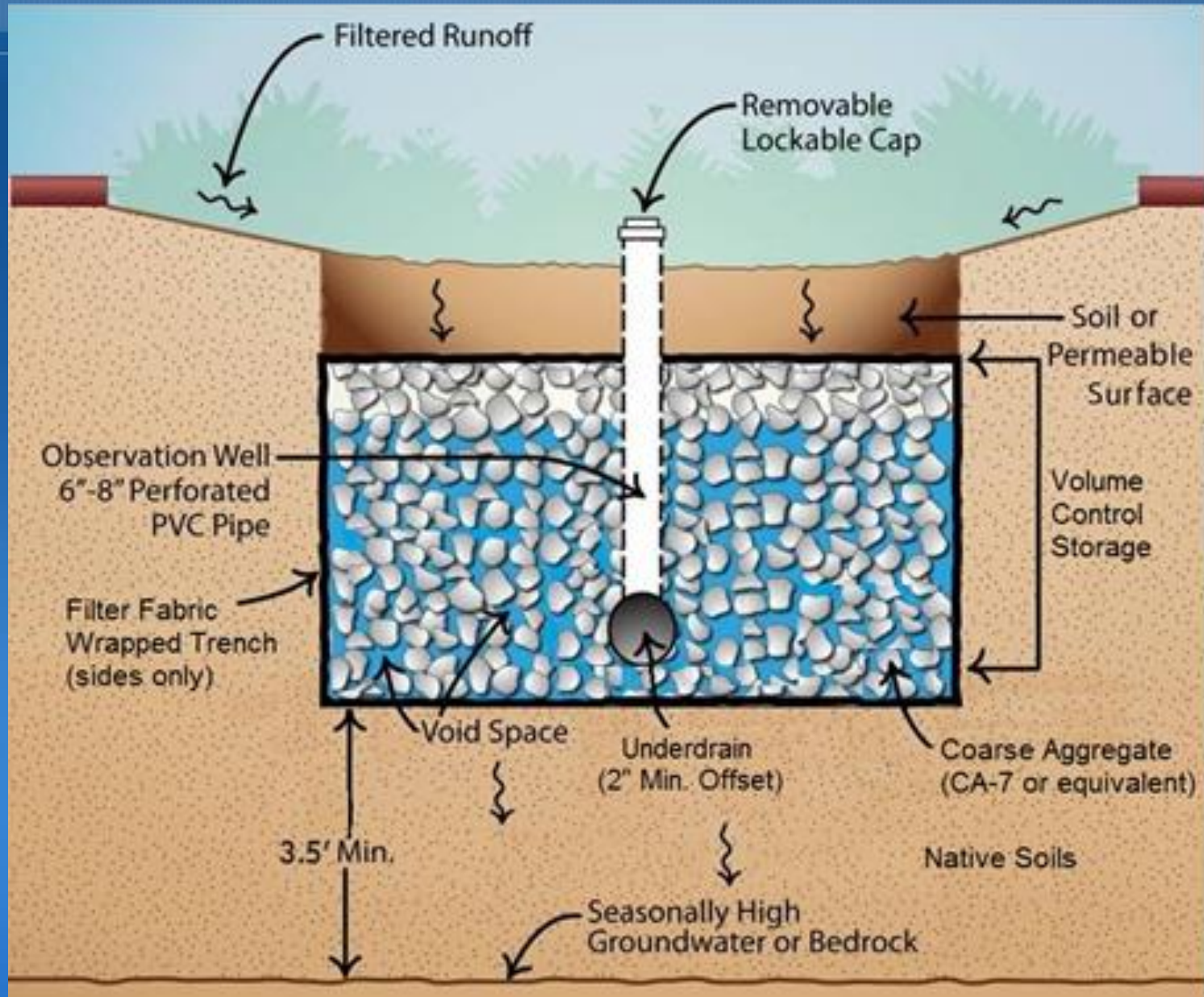
## WMO Volume Control Summary

- When providing storage in void space of aggregate, stone must be angular cut and cleaned/washed free of fines. Different aggregate sizes are acceptable
- Underdrains are required, and must be offset at least 2" above bottom of volume control storage
- Bottom of storage must be above groundwater level
  - 2 feet in separate sewer areas
  - 3.5 ft in combined sewer areas
  - Highest seasonal groundwater level established through soil borings
- One monitoring well per 40,000 ft<sup>2</sup> of area

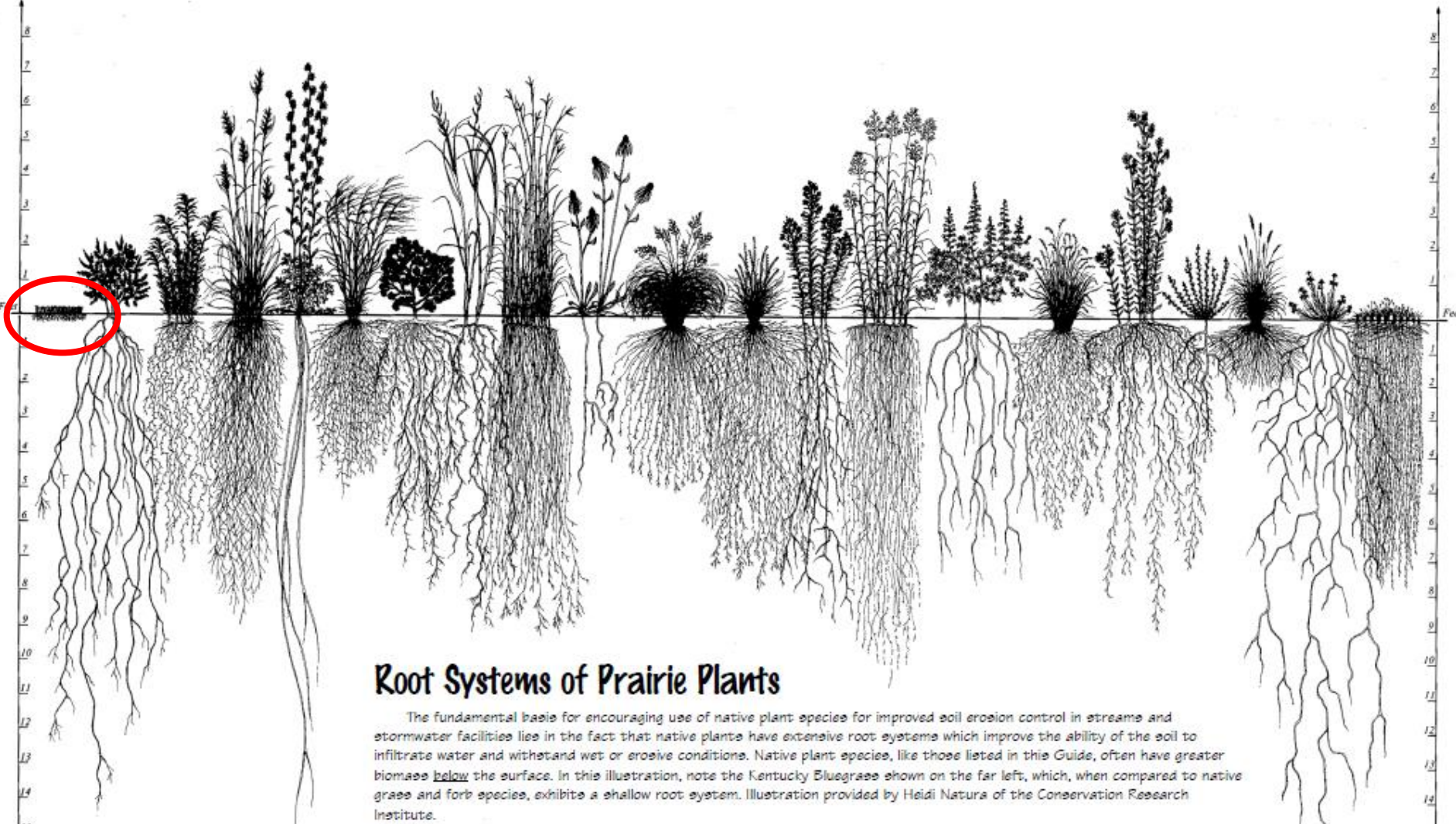


# Green Infrastructure (GI) a.k.a. Volume Control (VC)





**Cross Section - Typical Volume Control System**



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

# Root Systems: Turf Grass to Native Plants



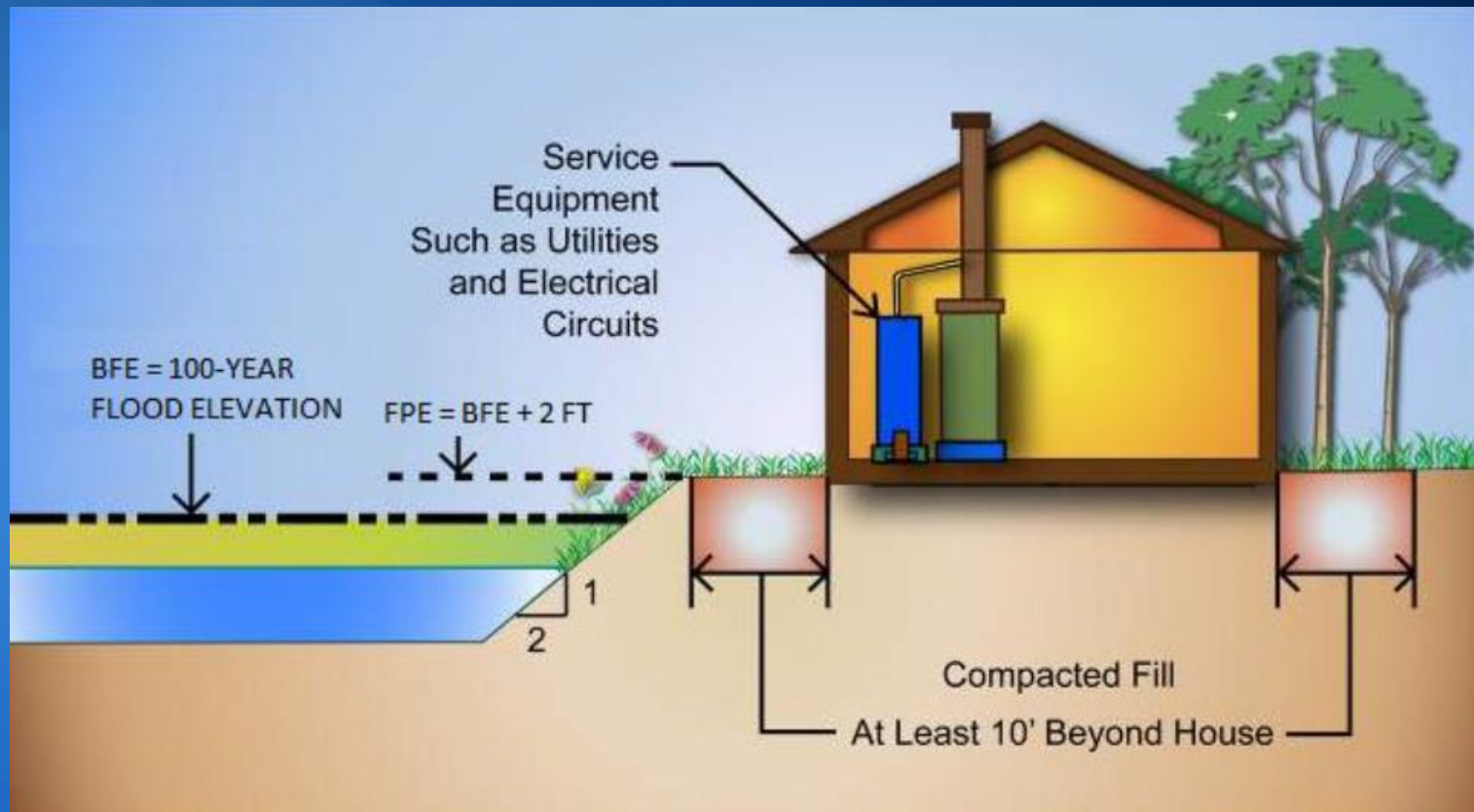
## Flow-Through Practices

- Required for portion of volume control not being provided by volume control practices
- Common flow-through practices are:
  - Vegetated Filter Strips
  - Bio Swales
  - Constructed Wetlands
  - Catch Basin Inserts
  - Oil and Grit Separators
- No detention volume credit for flow-through practices

# Floodplain



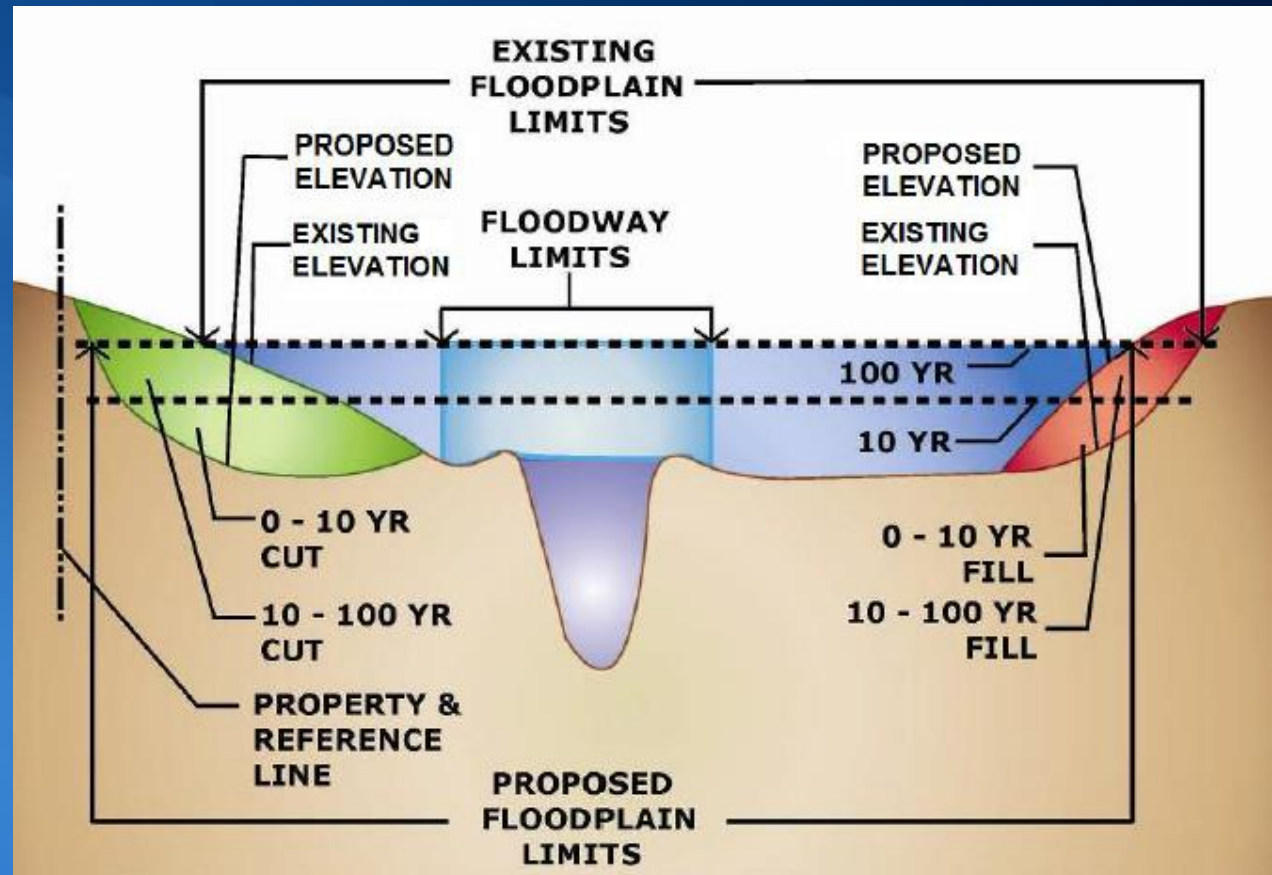
- **Flood Protection Elevation**
  - $FPE = BFE + 2 \text{ feet}$





# Compensatory Storage

- **Ratio**
  - 1.1:1.0
- **Incremental**
  - 0 – 10 Year
  - 10 – 100 Year





# Multi-County Municipalities

- **May adopt adjacent county stormwater ordinance**
- **Process**
  - Letter of intent
  - Adoption of adjacent county ordinance
  - Intergovernmental Agreement
- **Permits**
  - Municipality issues permits for activities in Section 201.1
  - District issues permits for activities in Section 201.2





# Technical Guidance Manual

<b>Article 2</b>	<b>Applicability and General Provisions</b>
<b>Article 3</b>	<b>Watershed Management Permit Requirements and Submittals</b>
<b>Article 4</b>	<b>Requirements for Erosion and Sediment Control</b>
<b>Article 5</b>	<b>Requirements for Stormwater Management</b>
<b>Article 6</b>	<b>Requirements for Flood Protection Areas</b>
<b>Article 7</b>	<b>Requirements for Sewer Construction</b>
<b>Article 9</b>	<b>Maintenance</b>
<b>Article 10</b>	<b>Inspection</b>
<b>Article 14</b>	<b>Administration</b>



# Do I need a WMO Permit... ... Even Here?

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



# Thank you

## Questions & Discussion

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