

## Session 4C: Infrastructure/BMP

# Wescott Park, Village of Northbrook: Underground Stormwater Storage Facility and Rainwater Harvesting

March 9, 2017

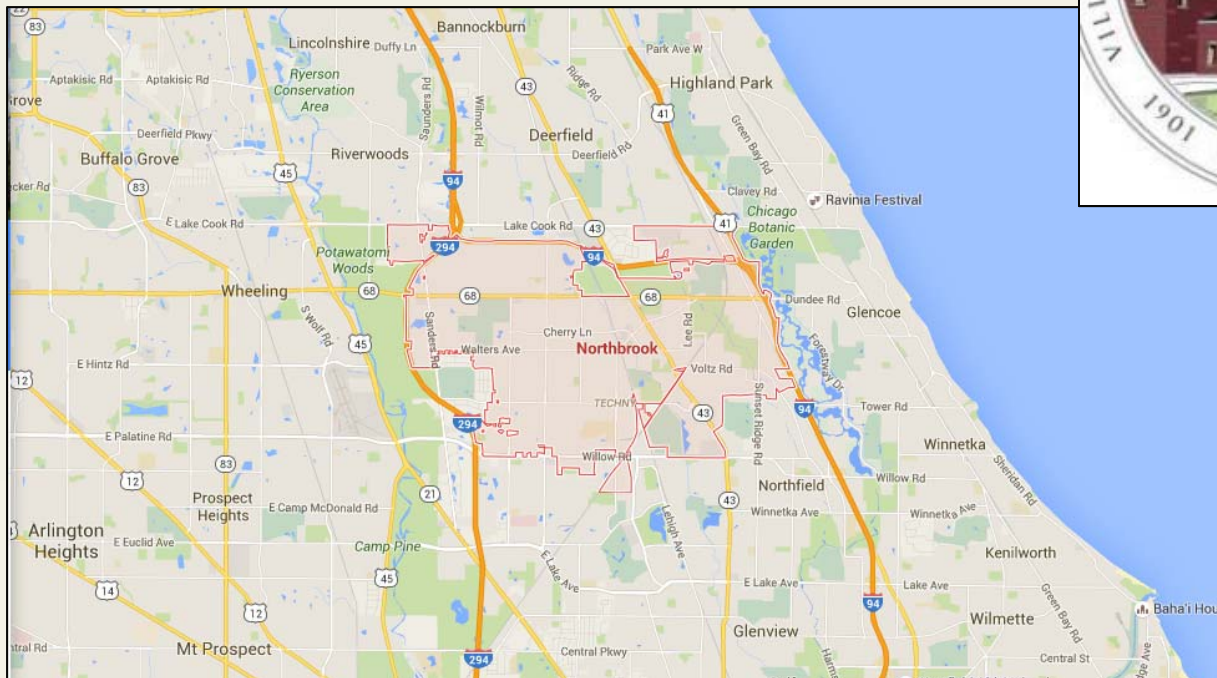
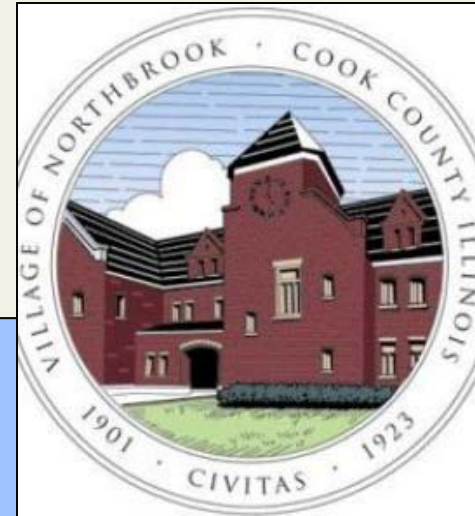


Kelly Hamill *Village of Northbrook*

Paul Siegfried, P.E., CFM, CPESC *Baxter & Woodman*

# Village of Northbrook

- Cook County
- Population: 33,170
- 13 Square Miles



# Master Stormwater Management Plan

## 1<sup>st</sup> Edition

- Created in response to 1982 and 1987 flood events
- Approved in 1993

## 1996 and 2002 Updates

- Included updated costs
- Reflected completed projects

## 2011 Update

- Addendums added in 2012 & 2015
- In total, 31 potential projects included



# Wescott Park Stormwater Detention





# Past Flooding



# Study Phase





# Study Phase: Proposed Conditions

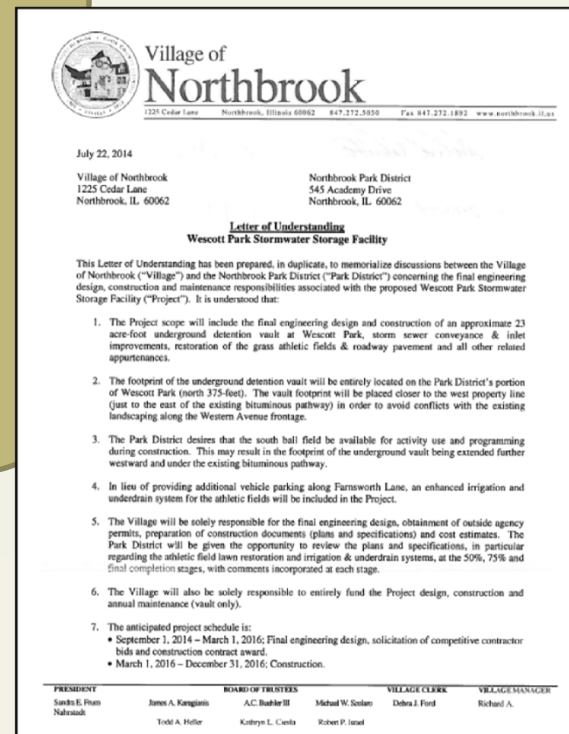




# School and Park District Coordination

## Letter of Understanding/IGA

- Agreement between Village and Park District
- Defined:
  - Construction limits
  - Project schedule
  - Responsibilities
- Irrigation system to be provided



# MWRD Green Infrastructure Funding

Past partnerships with  
MWRD

Application for MWRD  
Green Infrastructure  
funding

Intergovernmental  
Agreement



**Metropolitan Water  
Reclamation District  
of Greater Chicago**

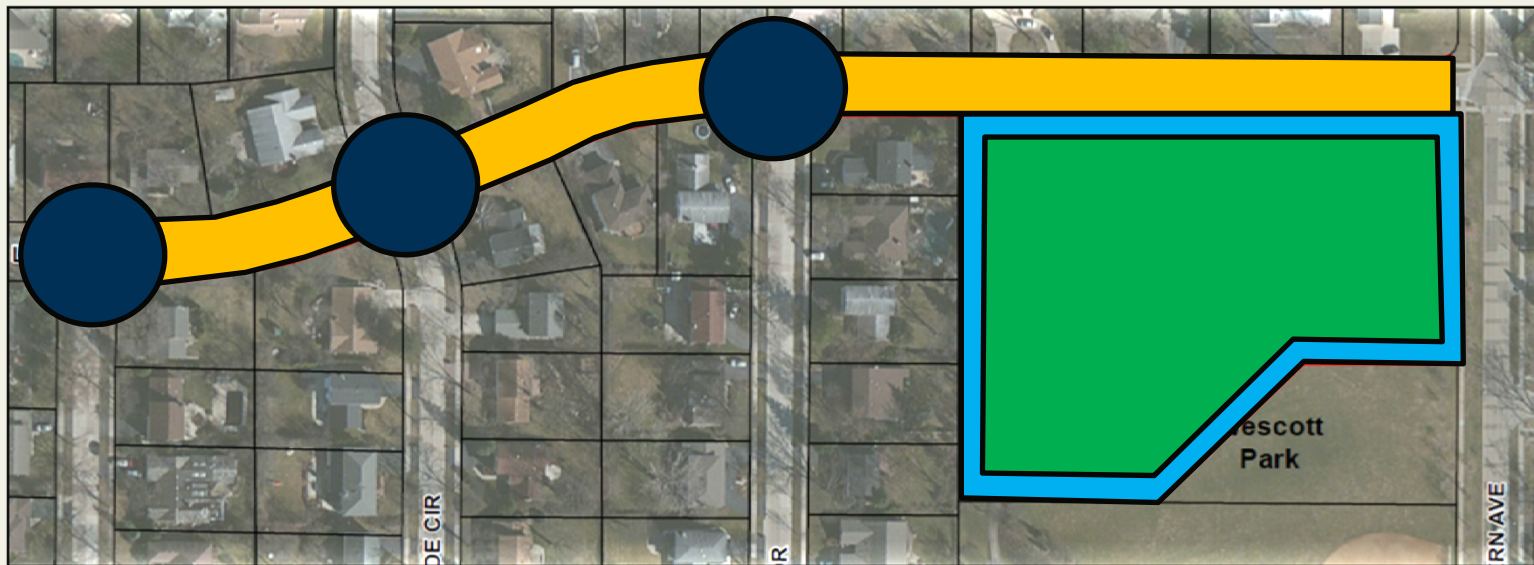
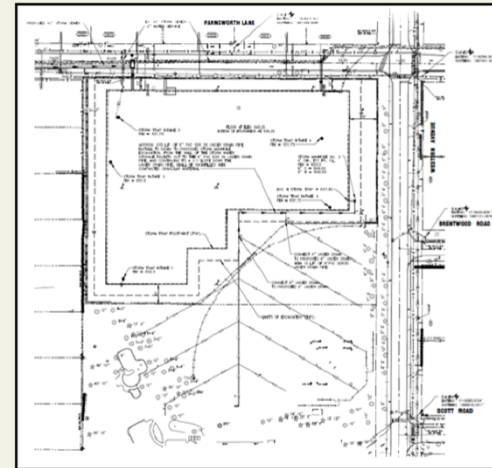
# Design Phase: Base Project

23.7 ac-ft  
Underground  
Detention

42" Storm  
Sewer

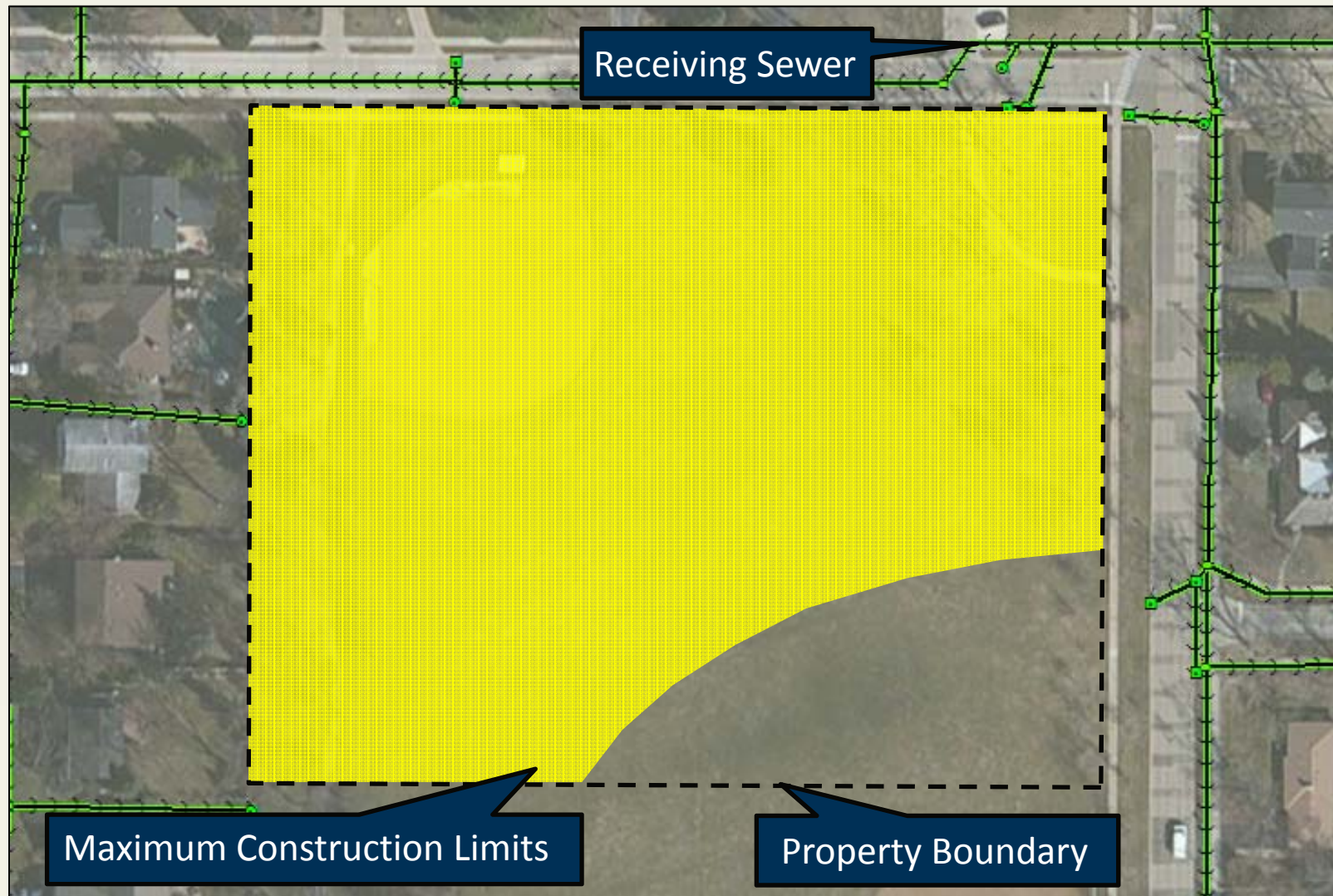
High capacity  
inlets

Irrigation  
System





# Underground Detention Design



# StormTrap DoubleTrap

Modular, precast  
concrete system

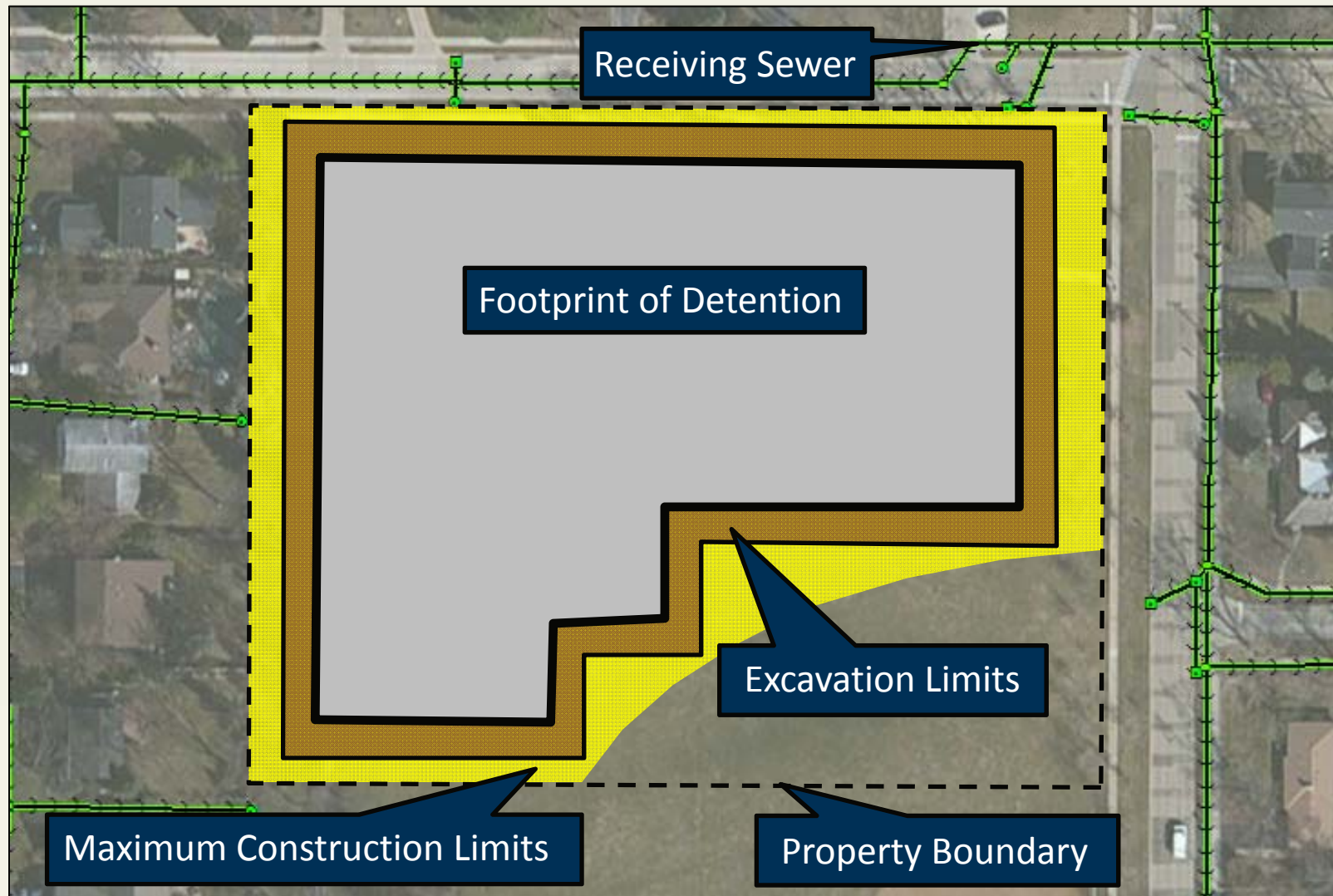
Height: 2'-2" to  
11'-4"

Can be  
configured into  
any footprint





# Underground Detention Design

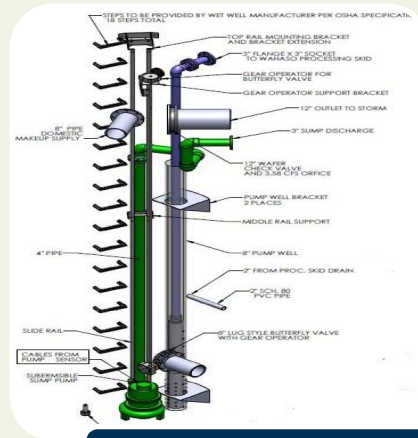




# Rainwater Harvesting System



Storage in  
StormTrap



Pump from  
StormTrap



Irrigation

# Illinois Department of Public Health

## Requirements for Conditional Approval

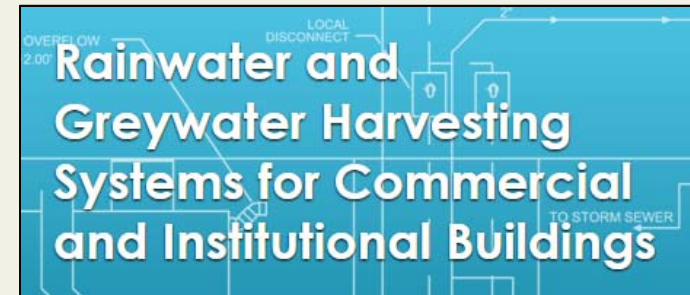
NSF 350 Standards

Monthly testing for E. coli for one year

Limited irrigation hours

NSF 350 STANDARD		
	MAX	AVG
Turbidity	5	2
TSS	30	10
CBOD	25	10
E. coli	200	2.2
Odor	Non-Offensive	
pH	6.0 – 9.0	

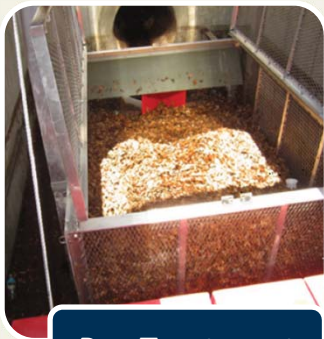
# Wahaso Water Harvesting Solutions



- Commercial rainwater and greywater harvesting systems
- Customized design/build systems
- Experience designing systems to meet NSF 350 standards



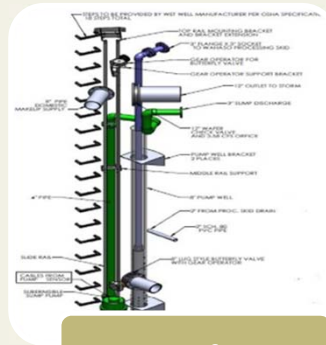
# Rainwater Harvesting System



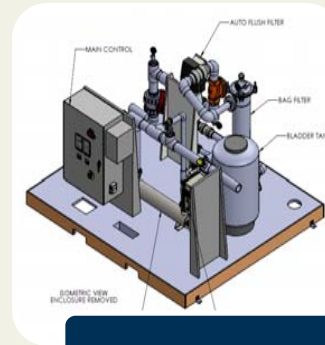
## Pre-Treatment Filtration



## Storage in StormTrap



## Pump from StormTrap



## UV Sanitization System



## Irrigation

# Pre-Treatment Filtration

## Suntree Technologies Nutrient Separating Baffle Box

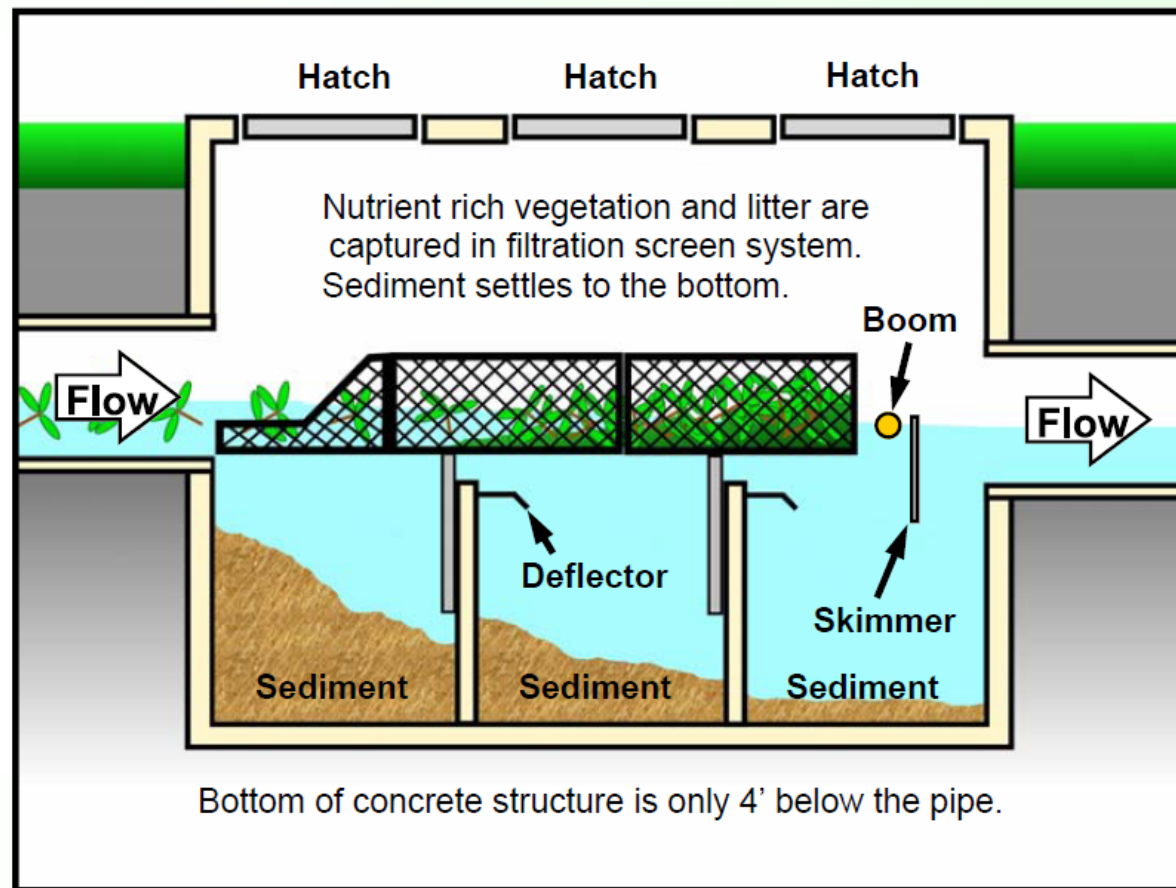


- Captures leaves, trash and other debris
- 90% removal of suspended solids
- Hydrocarbon removal



# Pre-Treatment Filtration

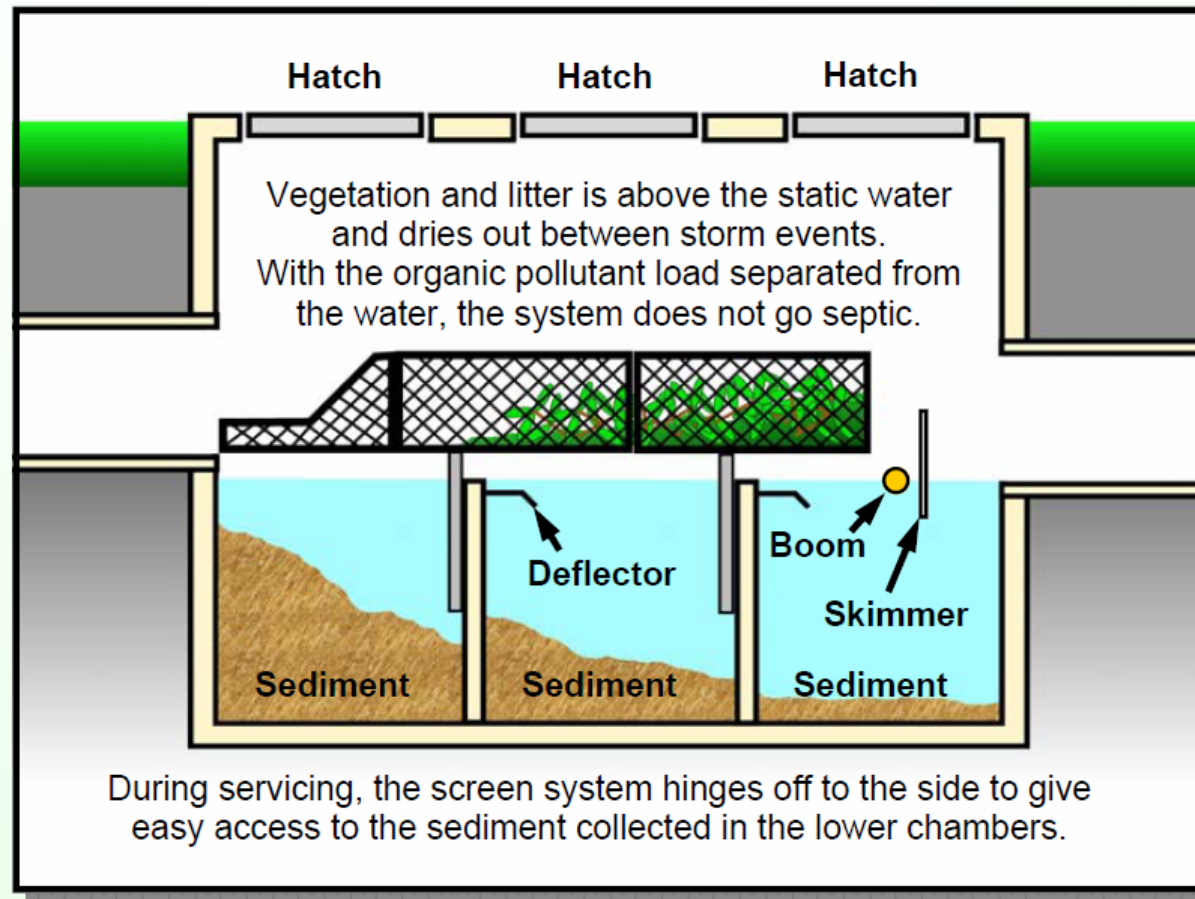
## During The Storm Event



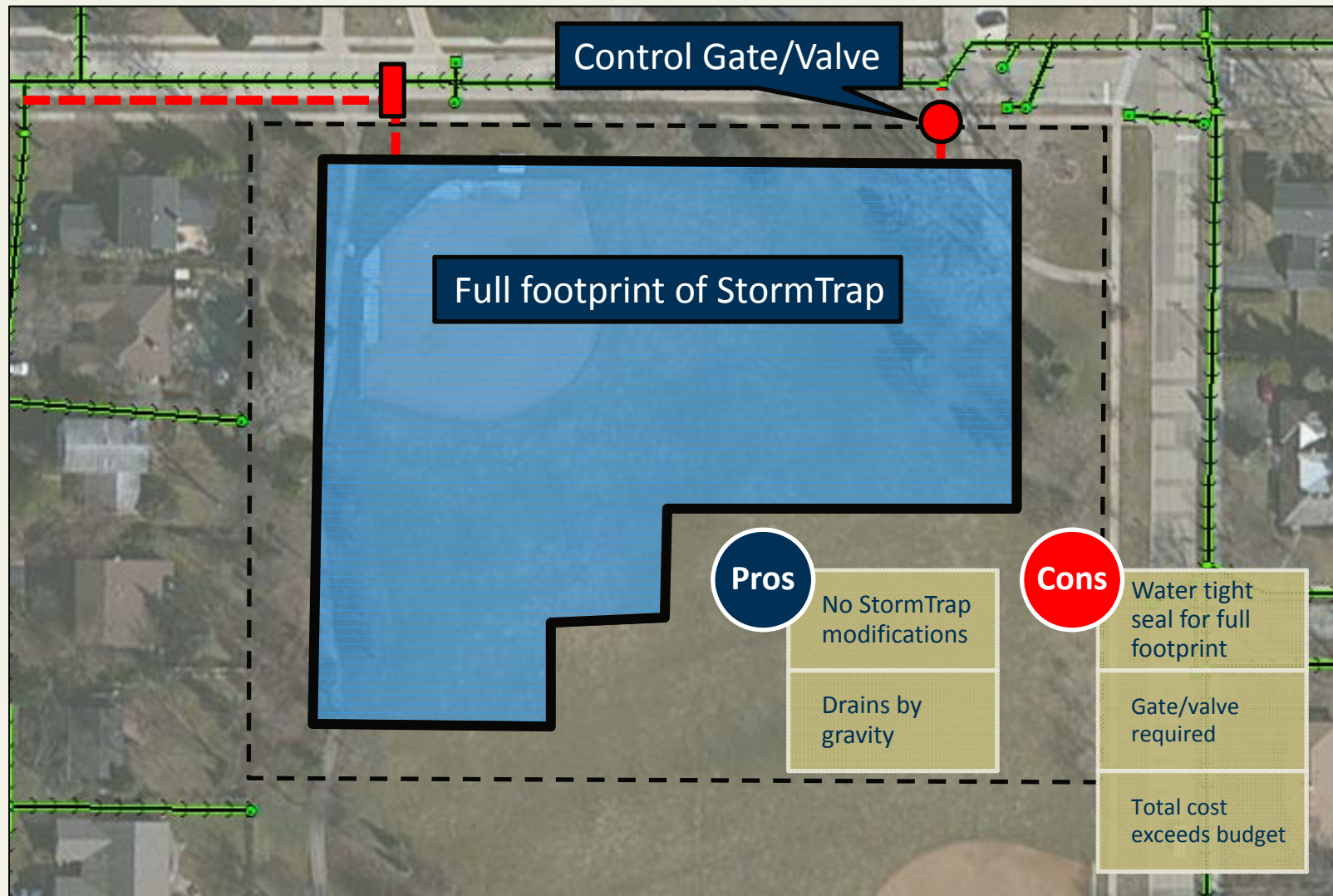


# Pre-Treatment Filtration

## After The Storm Event

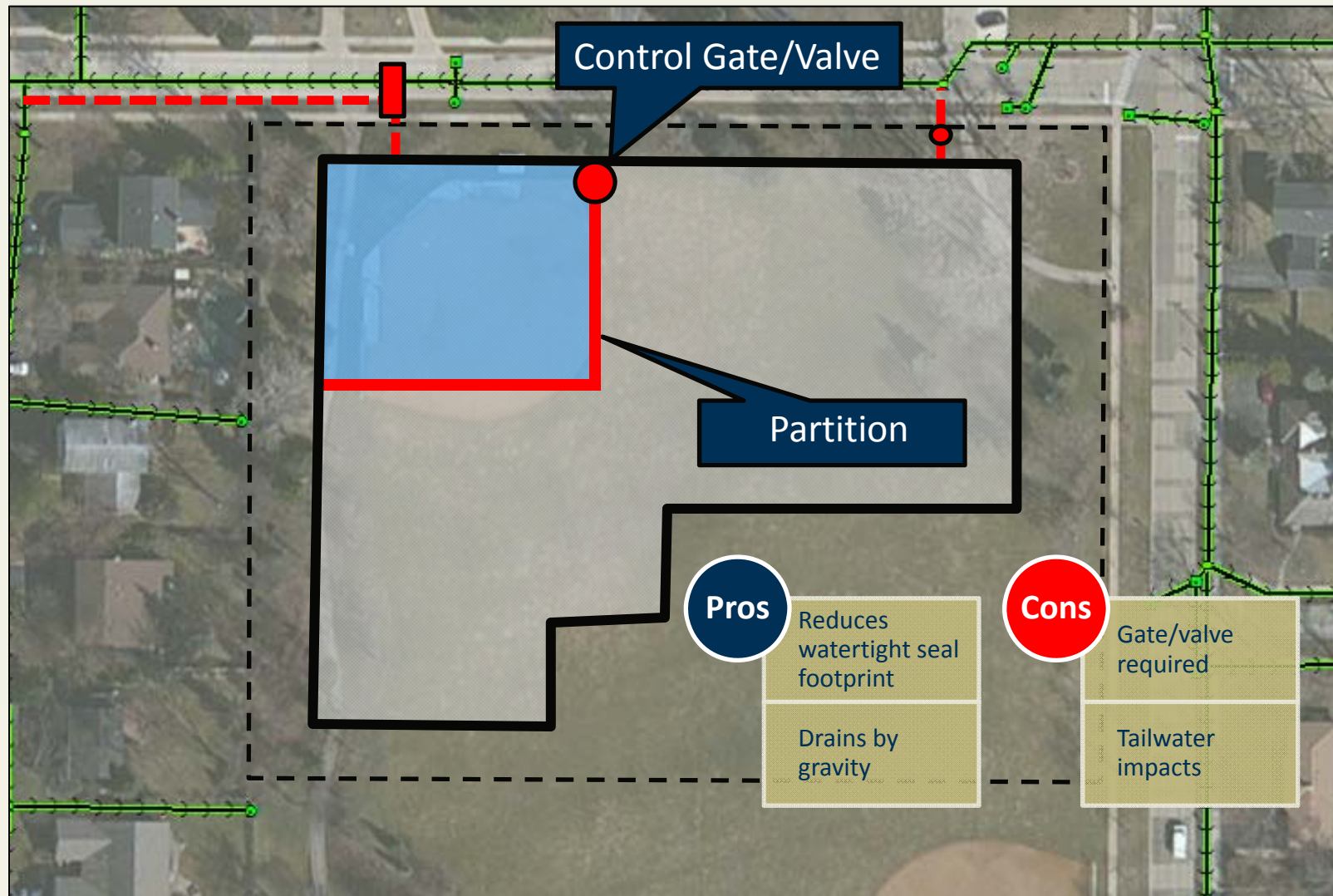


# Storage Configuration Option 1



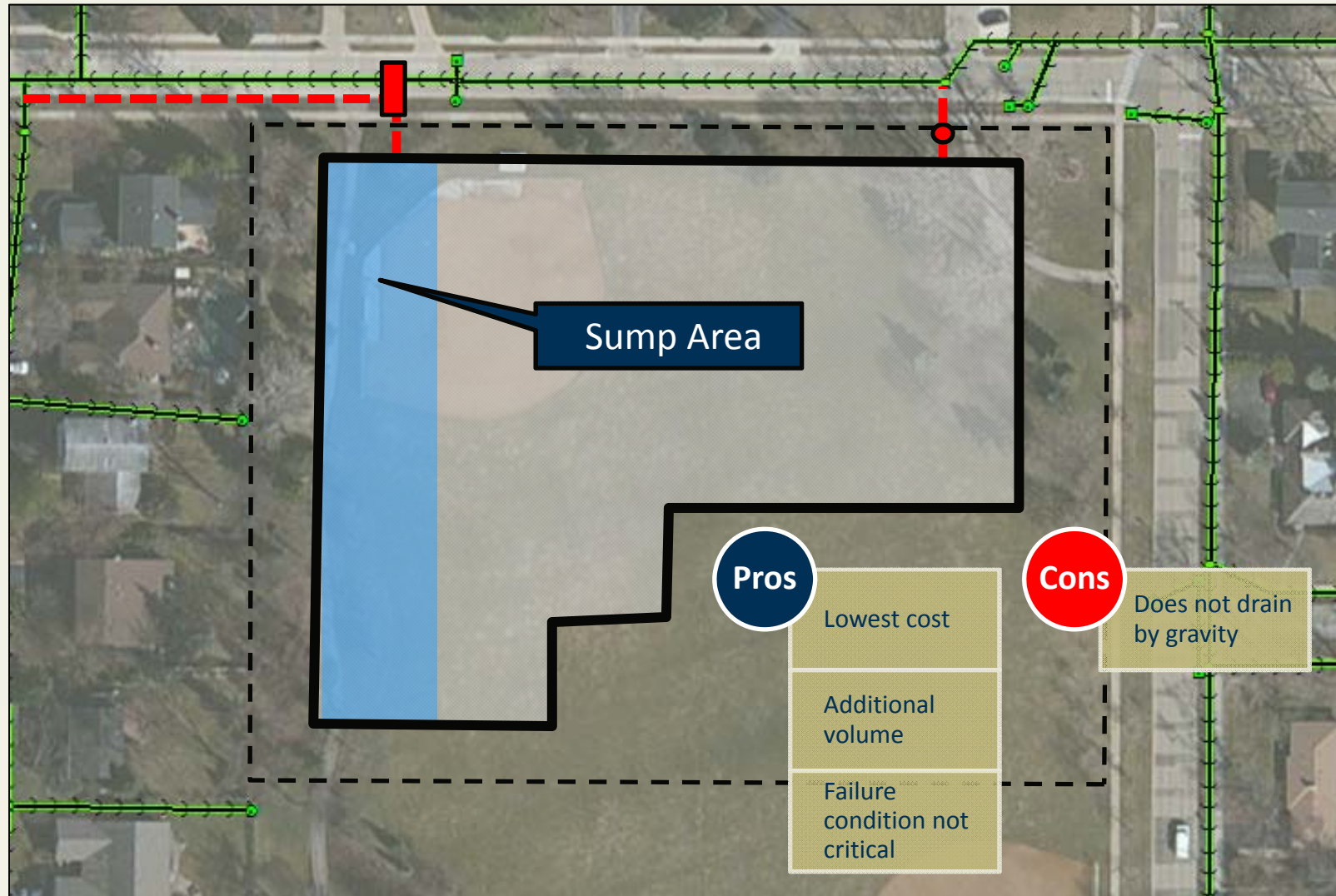


# Storage Configuration Option 2

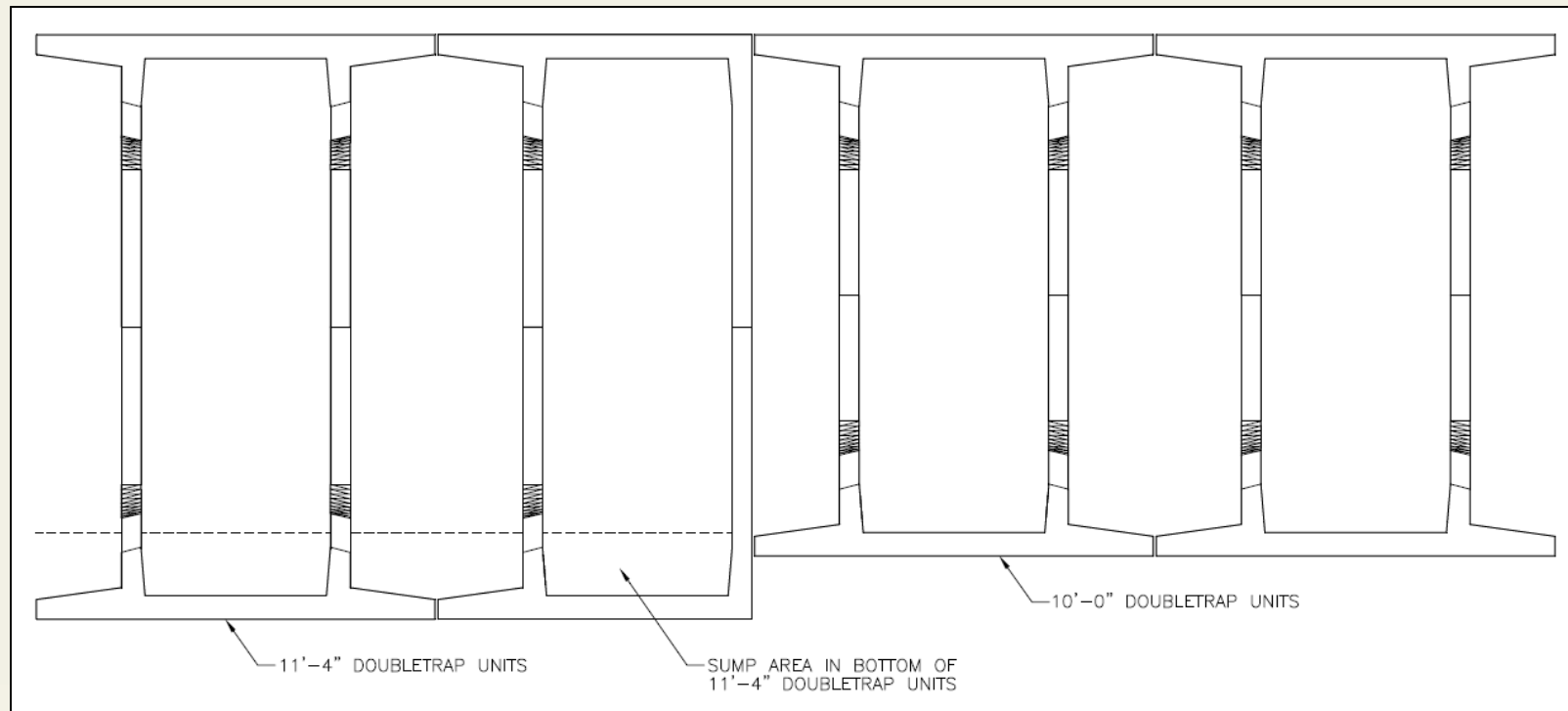




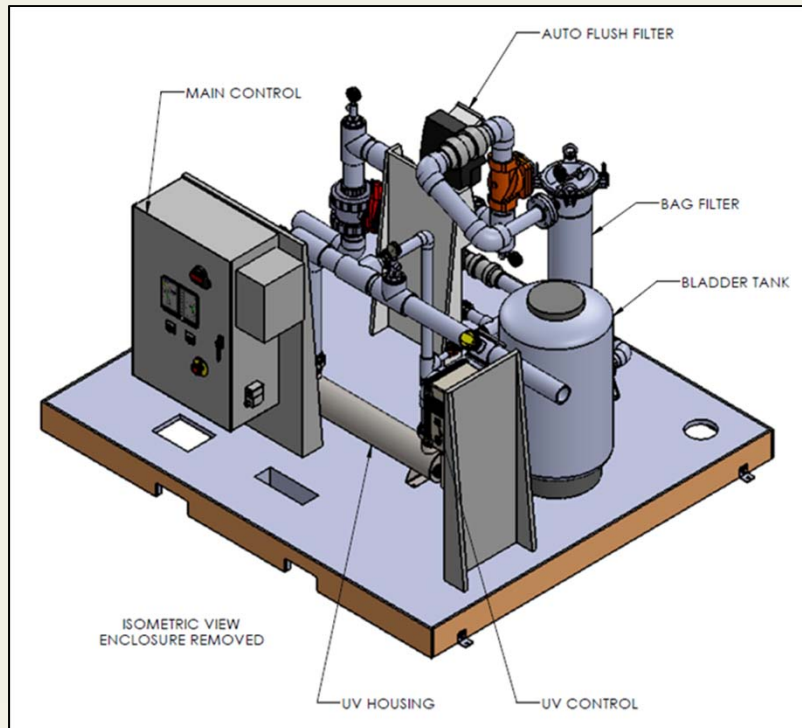
# Storage Configuration Option 3



# Storage Configuration Option 3



# UV Sanitization System



Additional pre-filtration

UV radiation kills  
bacteria and pathogens

Minimal contact time  
required

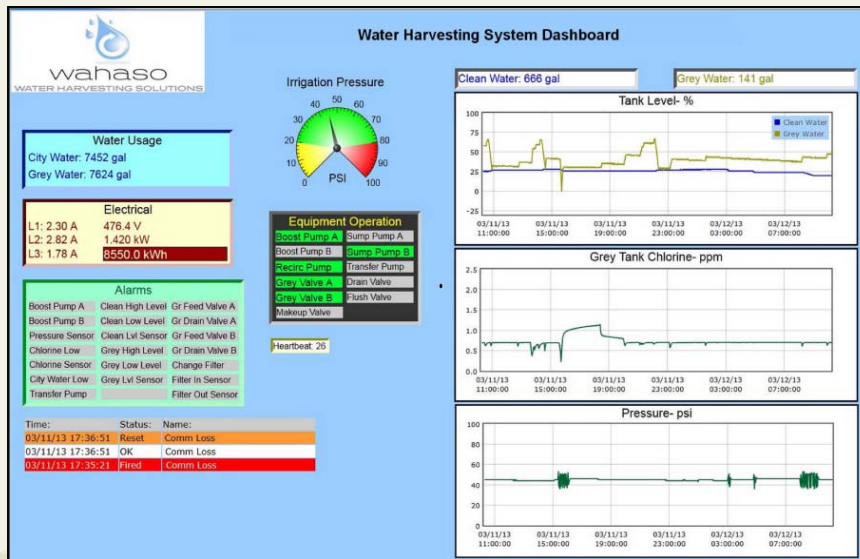
Non-chemical

No odor



# System Controls and Automation

- Utilizes real-time weather forecast data
- Pumps water to downstream sewer in advance of large storms
- Online dashboard to monitor system



# Recommended Maintenance

## Nutrient Separating Baffle Box

- Quarterly inspections
- Cleaning of screen, sediment chambers
- Replacement of boom

## UV Sanitation System

- Winterization and startup
- Bag filter replacement
- UV bulb replacement

## Annual Maintenance Contract

- Offered by Wahaso
- Covers winterization, startup, and bag filter replacement

# Construction Photos

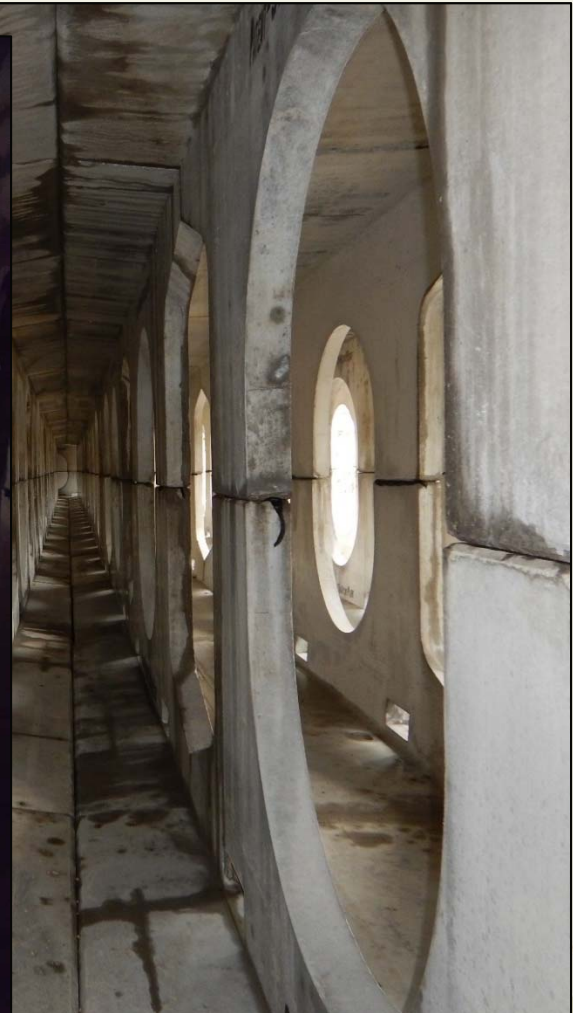




# Construction Photos



# Construction Photos





# Construction Photos





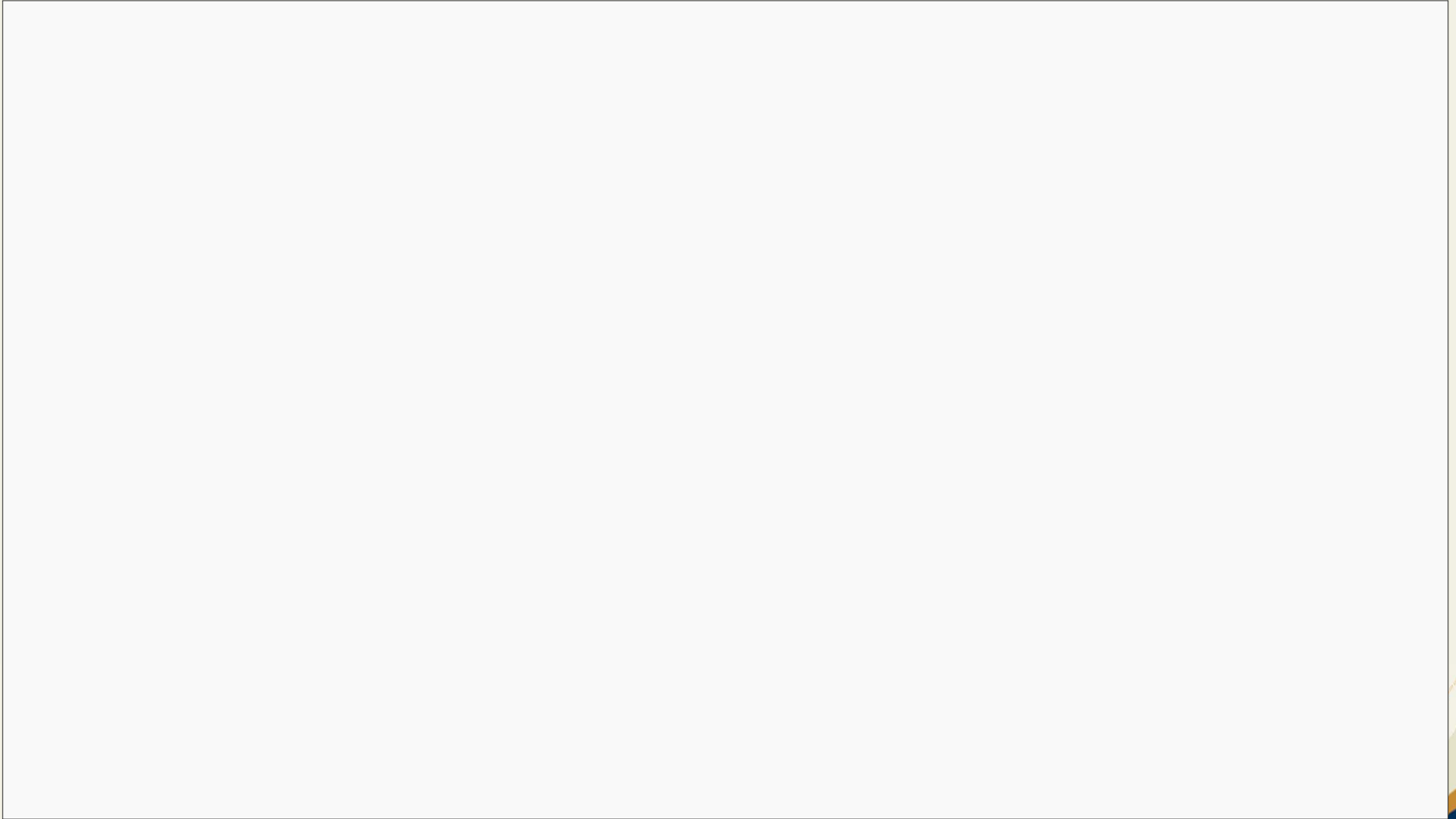
# Construction Photos



# Ribbon Cutting Ceremony



# Time-Lapse Construction Video





# Questions?

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