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* 

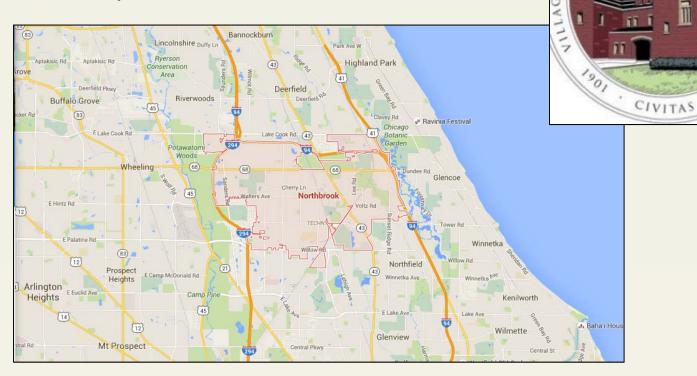


## Village of Northbrook

Cook County

• Population: 33,170

• 13 Square Miles



\*ORTHBROOK



## 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



July 22, 2014

Village of Northbrook 1225 Cedar Lane Northbrook, IL 60062

Northbrook Park District 545 Academy Drive Northbrook II, 60062

#### Letter of Understanding

This Letter of Understanding has been prepared, in duplicate, to memorialize discussions between the Village of Northbrook ("Village") and the Northbrook Park District ("Park District") concerning the final engineering design, construction and maintenance responsibilities associated with the proposed Wescott Park Stormwater Storage Facility ("Project"). It is understood that:

- The Project scope will include the final engineering design and construction of an approximate 23
  acre-foot underground detention vault at Wescott Park, storm sewer conveyance & inlet
  improvements, restoration of the grass athletic fields & roadway pavement and all other related
  appurlemances.
- 2. The footprint of the underground detention vault will be entirely located on the Park District's portion of Wescott Park (north 375-feet). The vault footprint will be placed closer to the west property line (just to the east of the existing bituminous pathway) in order to avoid conflicts with the existing landscaping along the Western Avenue frontage.
- The Park District desires that the south ball field be available for activity use and programming during construction. This may result in the footprint of the underground vault being extended further westward and under the existing bituminous pathway.
- In lieu of providing additional vehicle parking along Farnsworth Lane, an enhanced irrigation and underdrain system for the athletic fields will be included in the Project.
- 5. The Village will be solely responsible for the final engineering design, obtainment of outside agency permits, preparation of construction documents (plins and specifications) and cost estimates. The Park District will be given the opportunity to review the plans and specifications, in particular regarding the arbitect field lawn restoration and irrigation & underdrain systems, at the 50%, 75% and final completions agrees, with comments incorporated at each stage.
- The Village will also be solely responsible to entirely fund the Project design, construction and annual maintenance (vault only).
- 7. The anticipated project schedule is
- September 1, 2014 March 1, 2016; Final engineering design, solicitation of competitive contractors bide and construction contracts award.
- March 1, 2016 December 31, 2016; Construction

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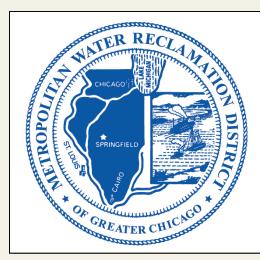


## MWRD Green Infrastructure Funding

Past partnerships with MWRD

Application for MWRD Green Infrastructure funding

Intergovernmental Agreement



Metropolitan Water Reclamation District of Greater Chicago



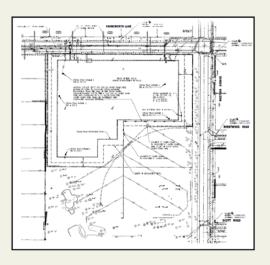
## Design Phase: Base Project

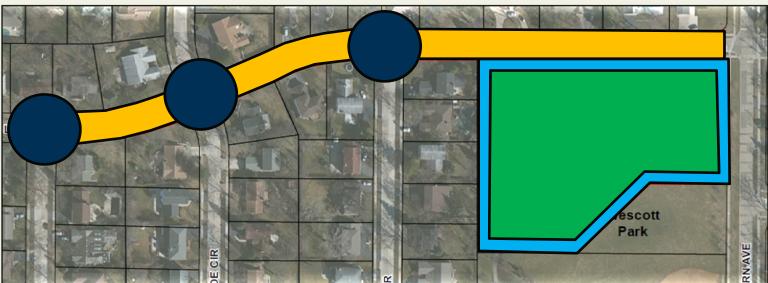
23.7 ac-ft Underground Detention

42" Storm Sewer

High capacity inlets

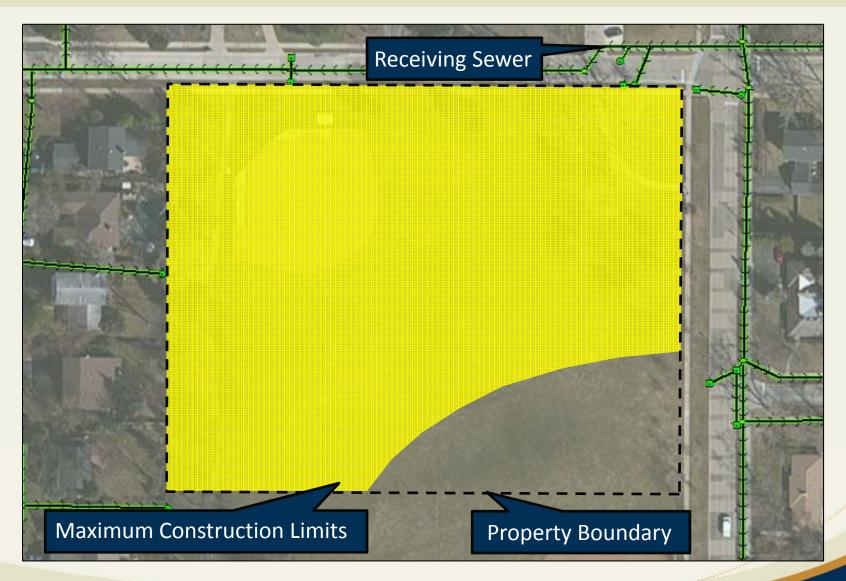
Irrigation System







## **Underground Detention Design**





## StormTrap DoubleTrap

Modular, precast concrete system

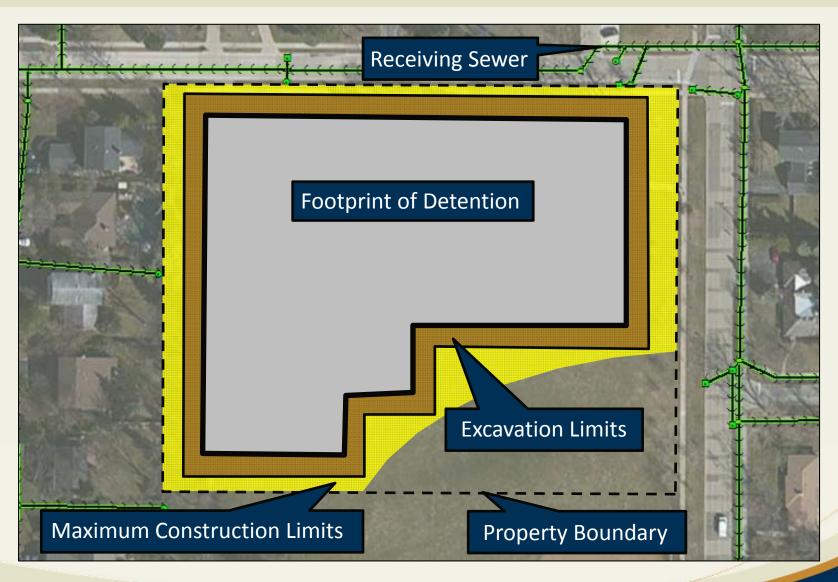
Height: 2'-2" to 11-4"

Can be configured into any footprint





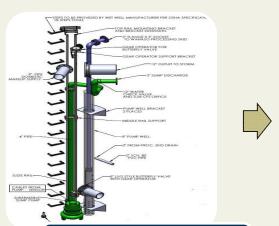
## **Underground Detention Design**





## Rainwater Harvesting System







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				
pН	6.0 – 9.0				



## Wahaso Water Harvesting Solutions



Rainwater and
Greywater Harvesting
Systems for Commercial
and Institutional Buildings

Commercial rainwater and greywater harvesting systems

Customized design/build systems

Experience designing systems to meet NSF 350 standards



## Rainwater Harvesting System

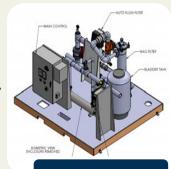




Storage in StormTrap



Pump from StormTrap



UV Sanitization System



Irrigation



#### **Pre-Treatment Filtration**

#### **Suntree Technologies Nutrient Separating Baffle Box**

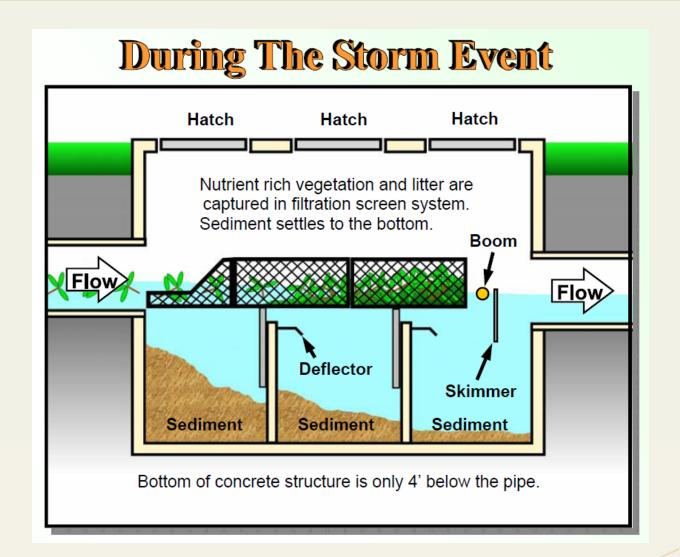


- Captures leaves, trash and other debris
- 90% removal of suspended solids
- Hydrocarbon removal



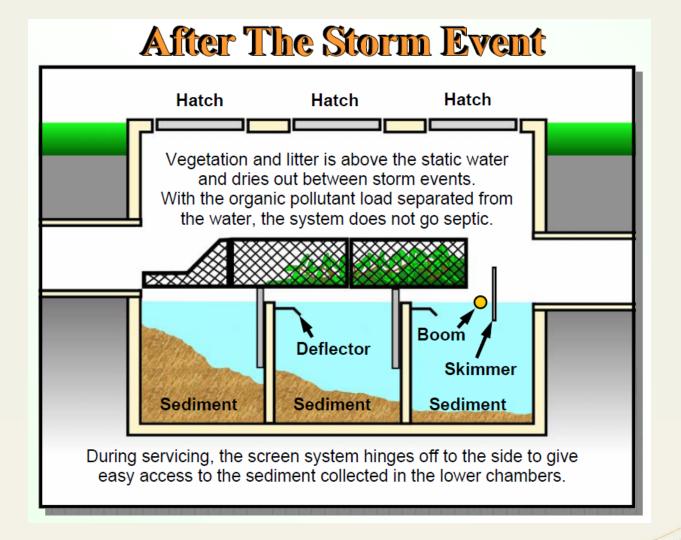


#### **Pre-Treatment Filtration**

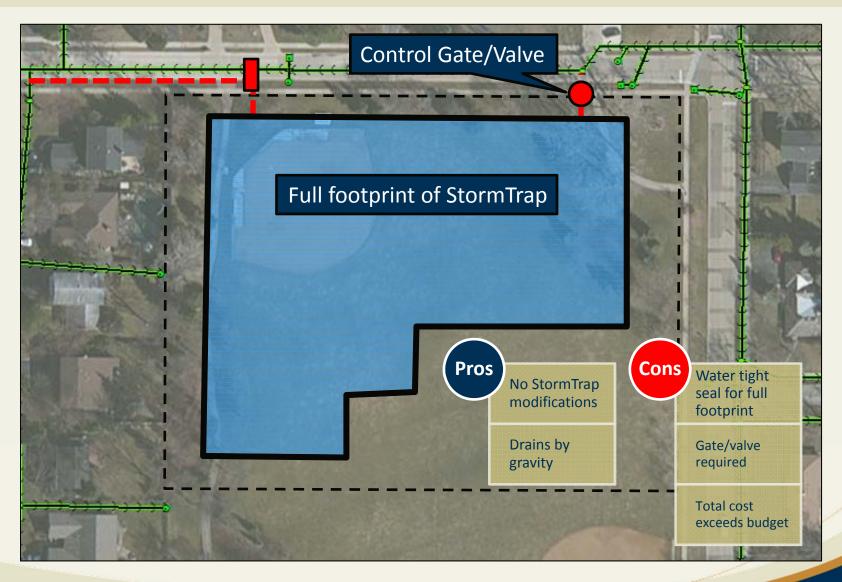




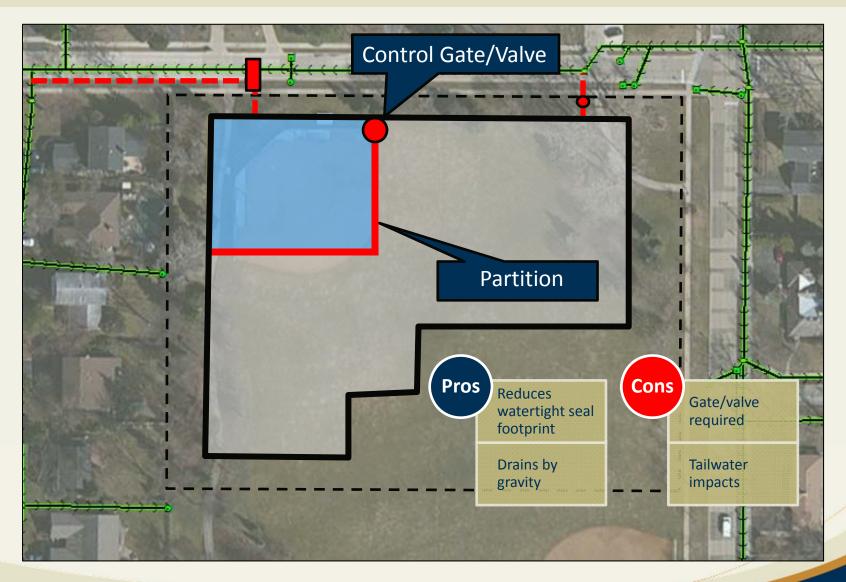
#### **Pre-Treatment Filtration**



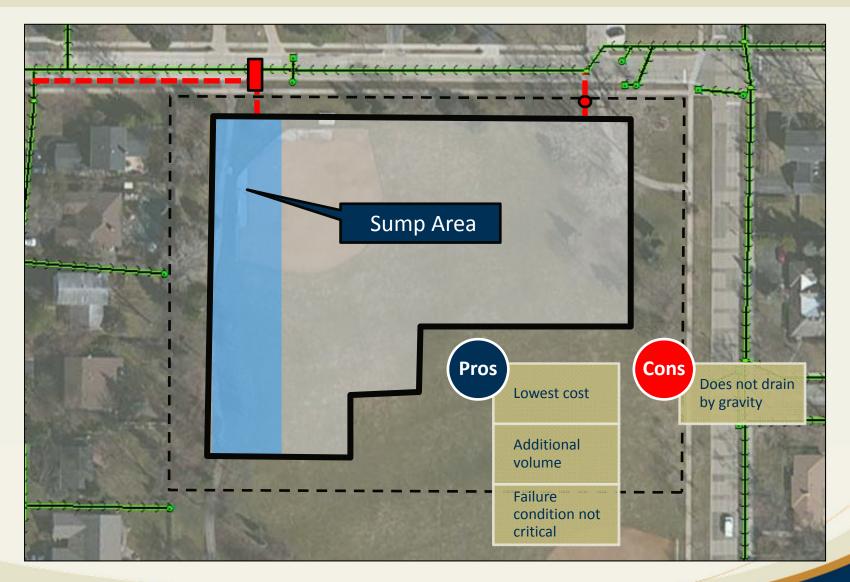




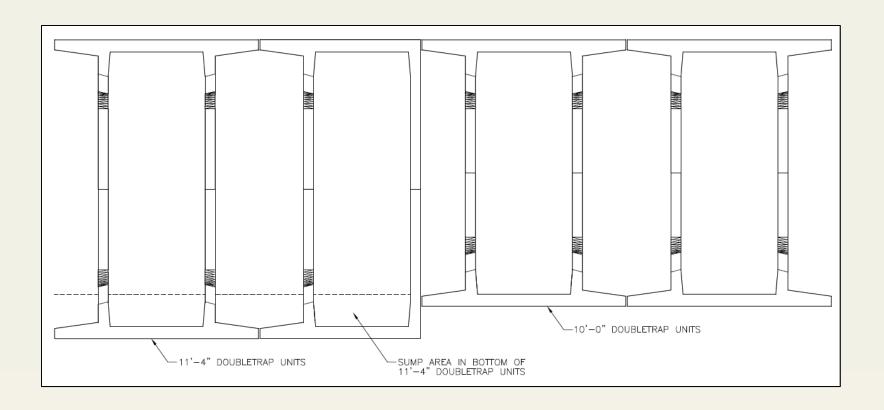






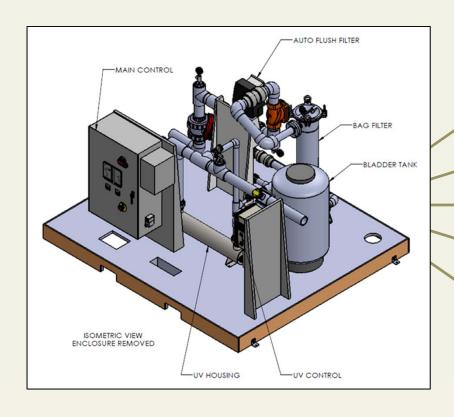








## **UV Sanitization System**



Additional pre-filtration

UV radiation kills bacteria and pathogens

Minimal contact time required

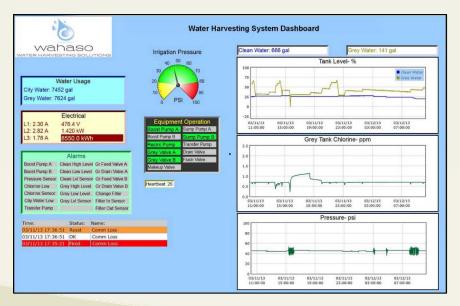
Non-chemical

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





























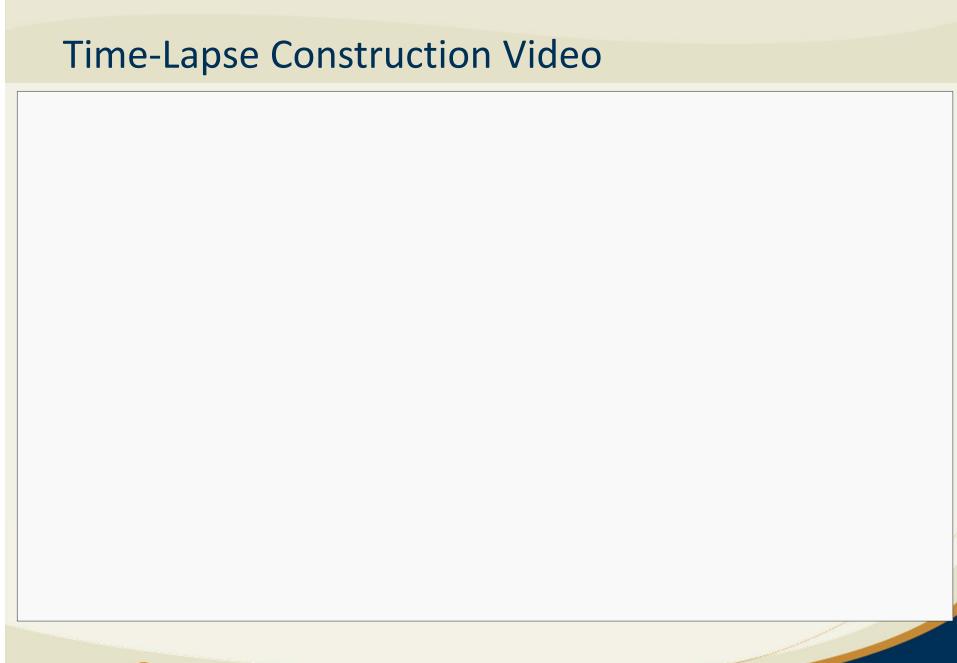




## **Ribbon Cutting Ceremony**









## Questions?

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