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

1st 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

Ten homes flood in 25-year storm event
Study Phase: Proposed Conditions

25-year flood protection for all homes
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

[Map showing project areas with labels for streets and parks]
Underground Detention Design

- Receiving Sewer
- Maximum Construction Limits
- Property Boundary
StormTrap DoubleTrap

- Modular, precast concrete system
- Height: 2’-2” to 11-4”
- Can be configured into any footprint
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

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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**

Nutrient rich vegetation and litter are captured in filtration screen system. Sediment settles to the bottom.

Bottom of concrete structure is only 4' below the pipe.
Pre-Treatment Filtration

**After The Storm Event**

Vegetation and litter is above the static water and dries out between storm events. With the organic pollutant load separated from the water, the system does not go septic.

During servicing, the screen system hinges off to the side to give easy access to the sediment collected in the lower chambers.
Storage Configuration Option 1

**Pros:***
- No StormTrap modifications
- Drains by gravity

**Cons:***
- Water tight seal for full footprint
- Gate/valve required
- Total cost exceeds budget

*Full footprint of StormTrap*
Storage Configuration Option 2

Pros:
- Reduces watertight seal footprint
- Drains by gravity

Cons:
- Gate/valve required
- Tailwater impacts

Control Gate/Valve
Partition
Storage Configuration Option 3

Sump Area

Pros:
- Lowest cost
- Additional volume
- Failure condition not critical

Cons:
- Does not drain by gravity
Storage Configuration Option 3

11'-4" DOUBLETRAP UNITS

SUMP AREA IN BOTTOM OF 11'-4" DOUBLETRAP UNITS

10'-0" DOUBLETRAP UNITS
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
Time-Lapse Construction Video
Questions?

Contact Info:
Paul Siegfried
psiegfried@baxterwoodman.com
815-459-1260

Kelly Hamill
kelly.hamill@northbrook.il.us
847-272-4711