

Sustainable Redevelopment of the Harrison Avenue Landfill

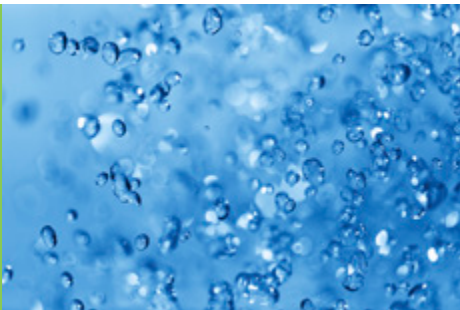
New Jersey Water Environment Association

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May 7, 2018



**CDM
Smith.**

WATER + ENVIRONMENT + TRANSPORTATION + ENERGY + FACILITIES

A photograph of green leaves and white flowers, likely a hydrangea, set against a light blue background. The image is positioned on the left side of a white horizontal band.

Agenda

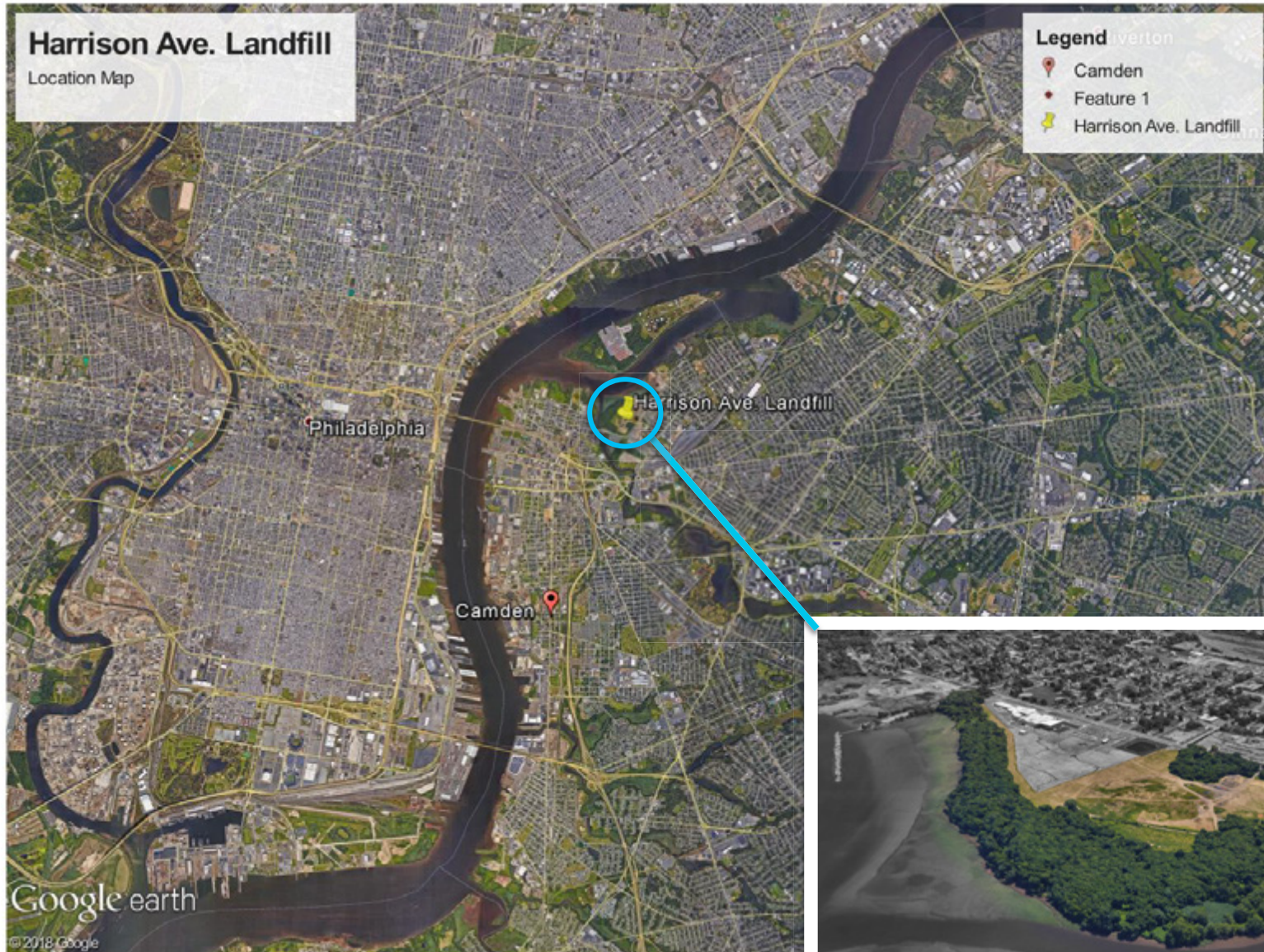
Agenda

- Project Site History
- Challenges
- Project Goals
- Solutions
- Current Status

A rectangular inset image showing a microscopic view of numerous small, blue, spherical bubbles or droplets. The bubbles are densely packed and vary in size, creating a textured, bubbly appearance. The background of the inset is a lighter blue color.

Project History

Harrison Avenue Landfill – Camden, NJ



Harrison Avenue Landfill – Camden, NJ

- 86 Acre MSW Landfill operated by City of Camden from approx. 1952 to 1971
- Landfill closure and remediation for 24 acre portion of site began in 2006
 - The Salvation Army Camden (TSAC)/Kroc Foundation opened the Ray & Joan Kroc Corps Community Center in 2014
- Remaining 62 acres requires closure and remediation



Site Challenges

- Contaminated Soil (*Remedial Investigation completed in 2012*)
- Leachate outbreaks along the failing shoreline
- Tidal range of 6.5'



Site Challenges, cont.

- Conserve large stands of mature trees along the shoreline
- Community vulnerable to flooding – Flood Hazard Area, 100 year flood elevation
- Design Schedule

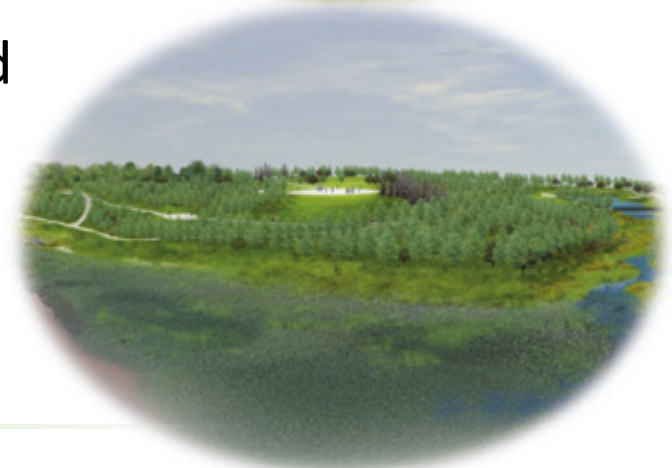


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Project Goals and Design Overview

Project Goals

- Cap the landfill & transform the site into a destination park
- Stabilize the shoreline
 - Restore its naturalistic character to create habitat → Living Shoreline
- Convert a portion of the site back to a tidal wetland
- Handle stormwater primarily with GI strategies and mimic natural hydrology to support various ecologies
- Protect the surrounding neighborhood to maximum extent possible



Stormwater Design Criteria

- New Jersey Stormwater Management Rule
 - Quantity – post-construction peak runoff rate less than pre-construction
 - Does not apply in tidal flood hazard areas
 - No flow can discharge to the Kroc Center property after project is complete
 - Quality – 80% reduction in TSS



Stormwater Design, cont.

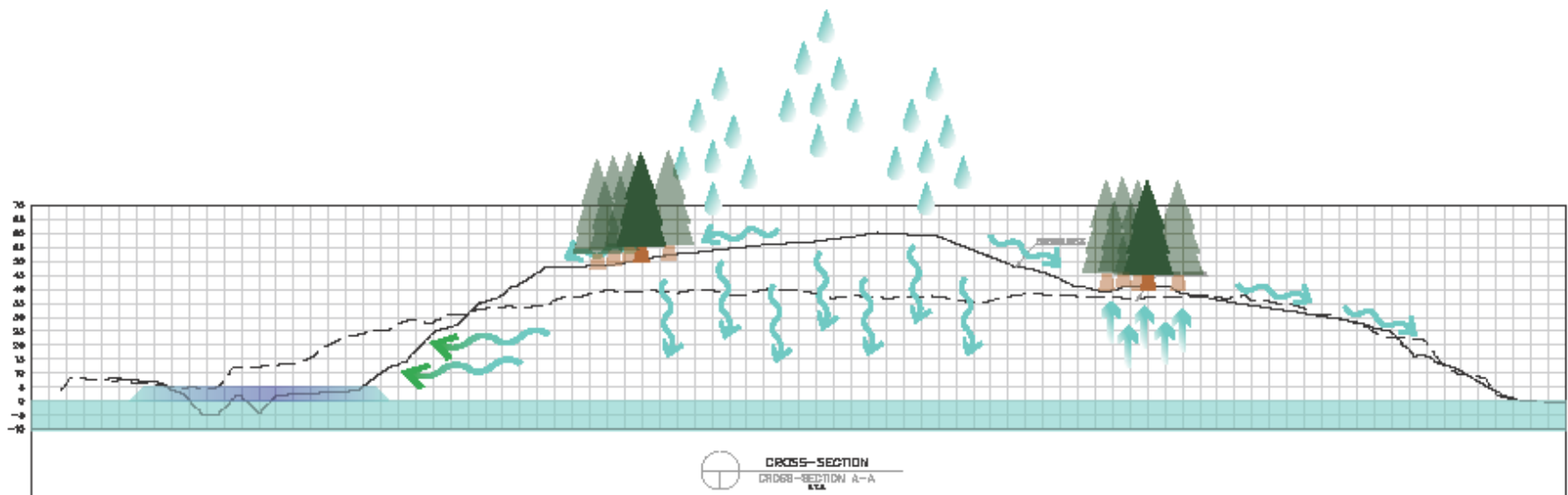
- NJ Stormwater Management Rule - Groundwater recharge
 - Demonstrate that
 - the site maintains 100% of average annual pre-construction recharge volume
 - or, the increase in stormwater runoff volume from existing to post-construction conditions for a 2-year storm is infiltrated
- Challenges related to site conditions
 - Existing Conditions - Due to growth of trees over the waste, the site is considered woods in good condition, with HSG A soils
 - Proposed Conditions - Site is considered a mixture of impervious and woods in good condition with HSG D soils
- The result?
 - **Significant increases in post-construction peak rates of runoff and**
 - **Significant decrease in annual recharge to groundwater**

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Final Design and Solutions

Comprehensive Water Management System

- Precipitation/runoff
- Tidal flow
- Wetlands
- Leachate
- Groundwater



Stormwater Design Solutions

■ Quantity

- Direct flow toward Delaware River to max. extent practicable
- Attenuate flow with green infrastructure
- Design stone trench drain along Kroc Center property line to convey flow to BMPs within the site

■ Quality

- Parking lots and driveways → treat with green infrastructure practices



Stormwater Design Solutions, cont.

- Groundwater recharge

- Used NJ Groundwater Recharge Spreadsheet (NJGRS)
 - Hydraulic soil group assumptions (HSG A for existing, HSG D for proposed)
- These assumptions led to a large annual recharge deficit for the site
 - The proposed impervious areas do not supply enough runoff to recharge
 - Hardship waiver received

Annual Groundwater Recharge Analysis (based on GSR-32)						Project Name: Harrison Avenue Landfill					
New Jersey Groundwater Recharge Spreadsheet Version 2.0 November 2003		Select Township ↓	Average Annual P (in)	Climatic Factor		Description: Landfill Restoration -Sitewide					
		CAMDEN CO., CAMDEN CITY	45.0	1.36		Analysis Date: 08/04/17					
Pre-Developed Conditions						Post-Developed Conditions					
Land Segment	Area (acres)	TR-55 Land Cover	Soil	Annual Recharge (in)	Annual Recharge (cu.ft)	Land Segment	Area (acres)	TR-55 Land Cover	Soil	Annual Recharge (in)	Annual Recharge (cu.ft)
1	63.55	Woods	Fort Mott	12.7	2,927,227	1	9.38	Impervious areas	Walkkill	0.0	-
2	0.49	Impervious areas	Fort Mott	0.0	-	2	30.17	Woods	Walkkill	0.0	-
3						3	1.44	Woods	Fort Mott	12.7	66,329
4						4	11.42	Open space	Walkkill	0.0	-
5						5	11.63	Woods, Pasture, Grassland or rangeland	Walkkill	0.0	-
6						6	0.0				
7	0.0					7	0.0				
8	0.0					8	0.0				
9	0.0					9	0.0				
10	0.0					10	0.0				

- Strategy to reduce infiltration through landfill waste to reduce groundwater contamination
 - Overexcavate bioretention basins removing waste and replace with sandy loam to bottom of bioretention soil profile

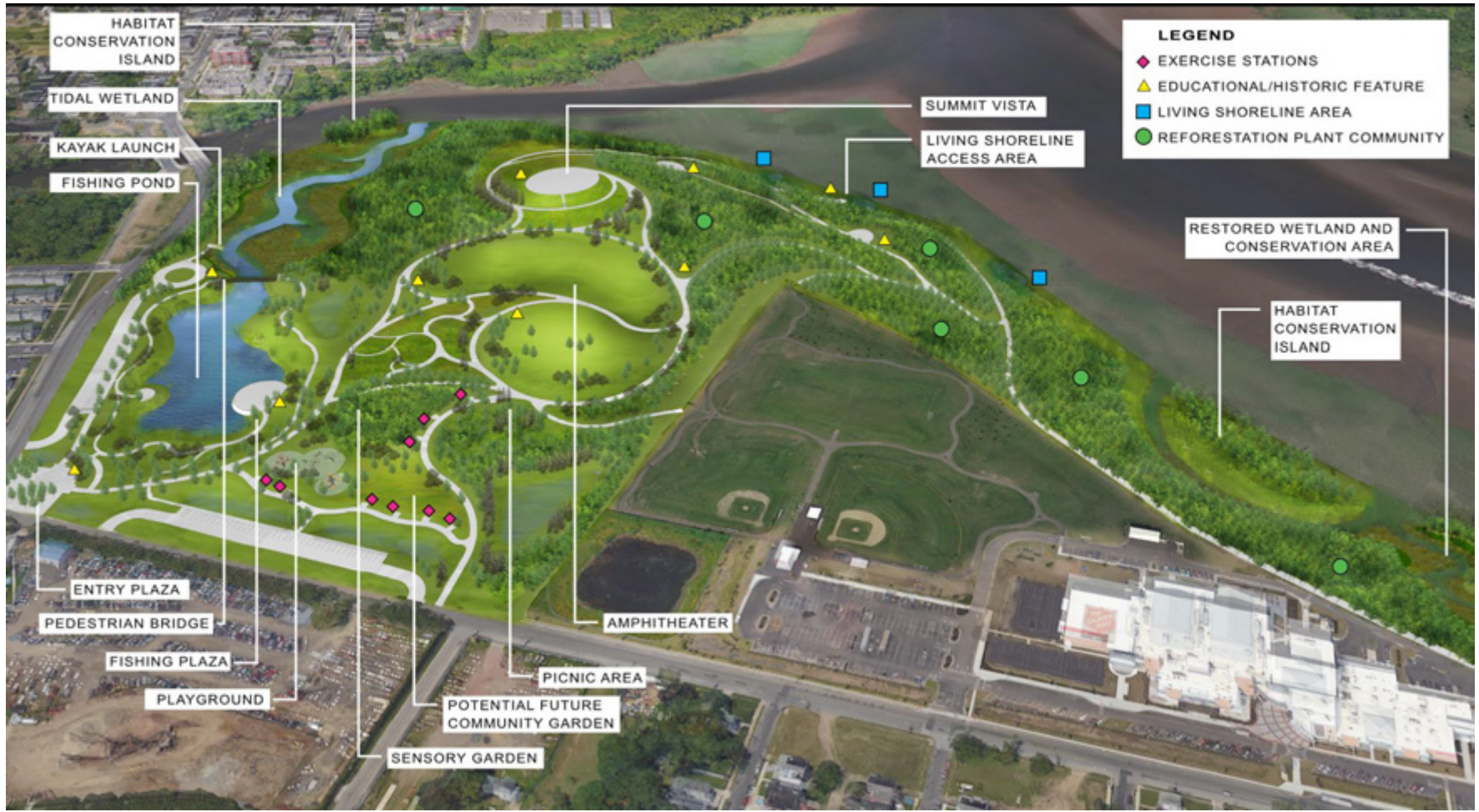
CRAMER HILL WATERFRONT PARK

CONCEPTUAL RENDERING

(VIEW FROM HARRISON AVENUE)



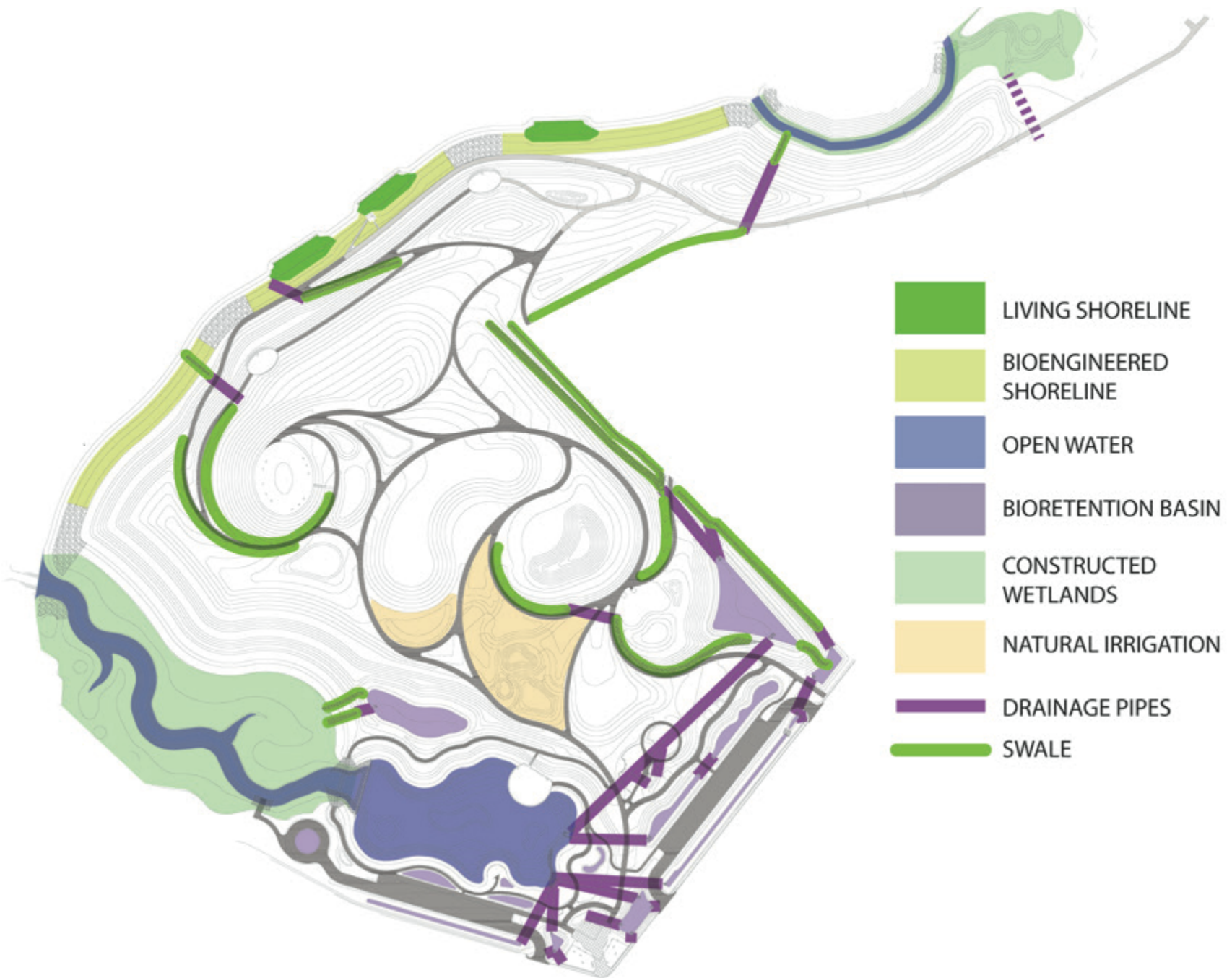
Integrating Stormwater Management Into Park Design

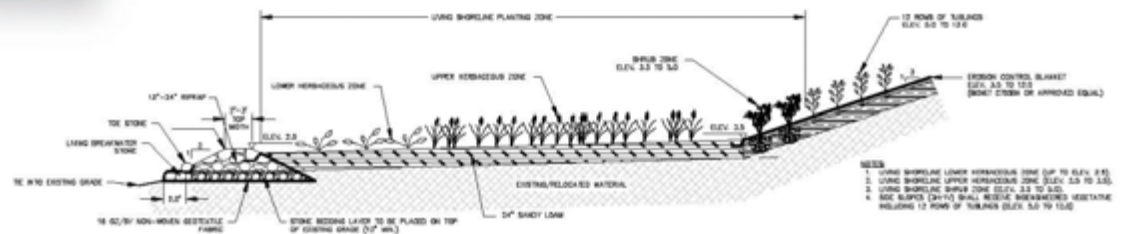
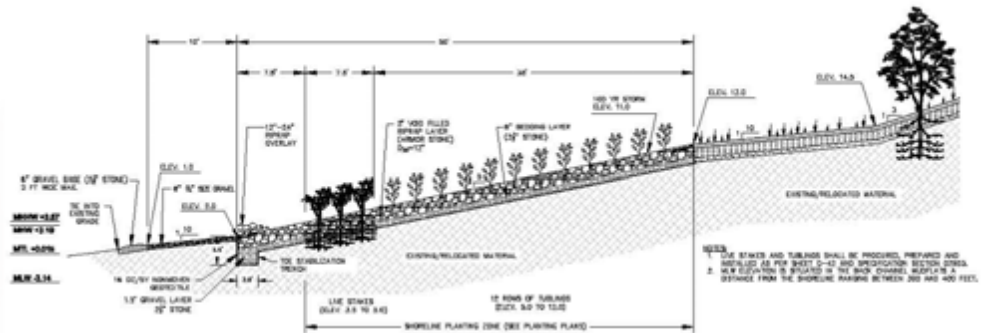
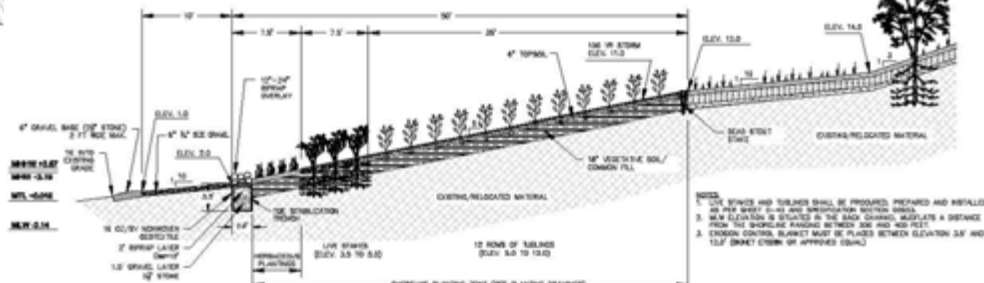


Integrating Stormwater Management Into Park Design

- Surface Flow
 - Semi-permeable cap provides barrier between contaminated soil and waste and public
 - Convey substantial volumes to bioretention basins
 - Vegetated and armored swales.
 - Basins blended into the landscape and vegetated
 - All overflow piped to fishing pond and/or Delaware River. Outflow channel at pond designed to mimic a stream bed with boulders, Delaware River stone, and plantings.
 - Surface flow directed to wetlands and planting areas to compensate for lack of irrigation







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Current Status of Project

Project Status

- Construction commenced in early March 2018 with tree clearing and tree chipping in April 2018.
- Construction scheduled to be substantially complete by April 2020
 - Landfill will be capped, site restored and planting of 379,000 plants will be complete.
- Five-year mitigation monitoring period for wetland plants



Acknowledgements

- We would like to acknowledge project partners. Thank you to NJDEP Office of Natural Resource Restoration and Division of Coastal Engineering, Camden Redevelopment Agency, Cooper's Ferry Partnership, TSAC/the Kroc Foundation, Cramer Hill Community Development Corporation, USEPA, and several other non-profits

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CRAMER HILL WATERFRONT PARK

CONCEPTUAL RENDERING

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