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Anacostia River Tunnel Design/Build Project Washington, DC

Shane Yanagisawa

Project Manager

Impregilo Healy Parsons JV

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Stakeholders

dc water is life®

dc clean RIVERS PROJECT

GREELEY AND HANSEN

IMPREGILO | HEALY | PARSONS

McMILLEN JACOBS ASSOCIATES

salini impregilo

Gilbane

LANE

HEALY
A WHOLLY OWNED SUBSIDIARY OF THE LANE CONSTRUCTION CORPORATION

HERRENKNECHT
Tunnelling Systems

PARSONS

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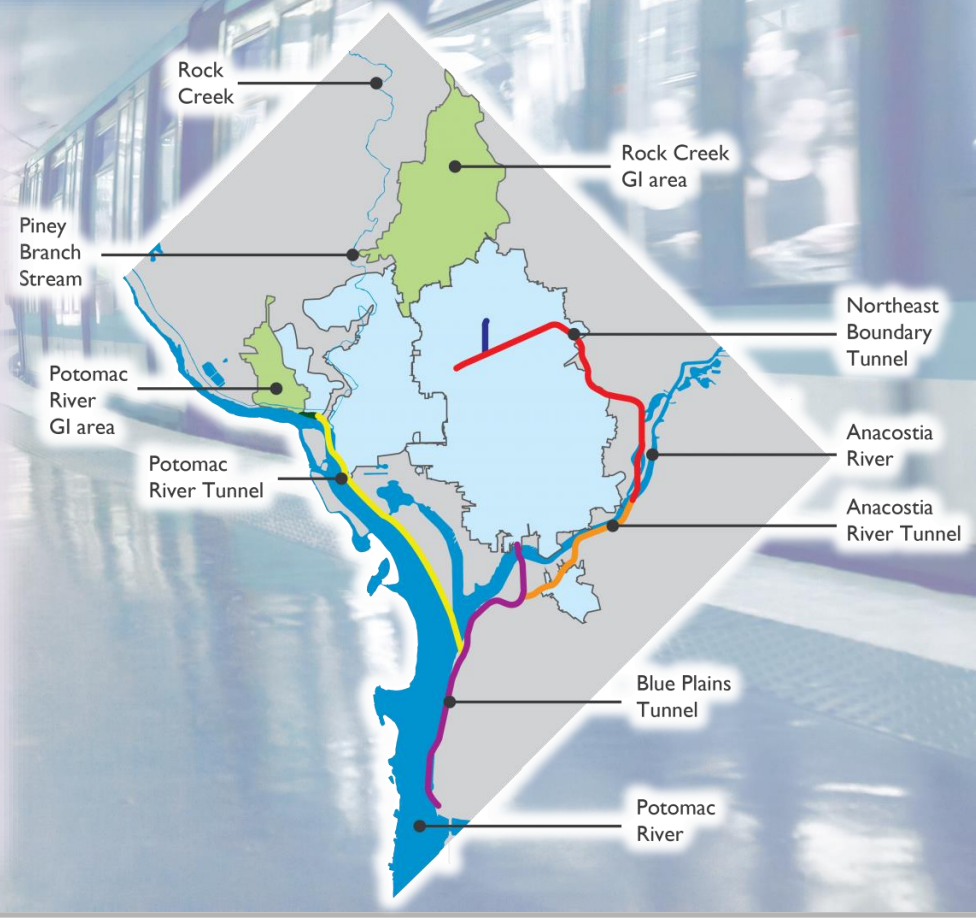
SUSTAINABILITY INITIATIVE - OF THE YEAR -

Main Components:

- 29km of tunnels from 7m to 5,5m diameter
- Drop shafts and adits
- Diversion structures from existing sewer to tunnels
- Ventilation Control Facilities
- Green Infrastructure



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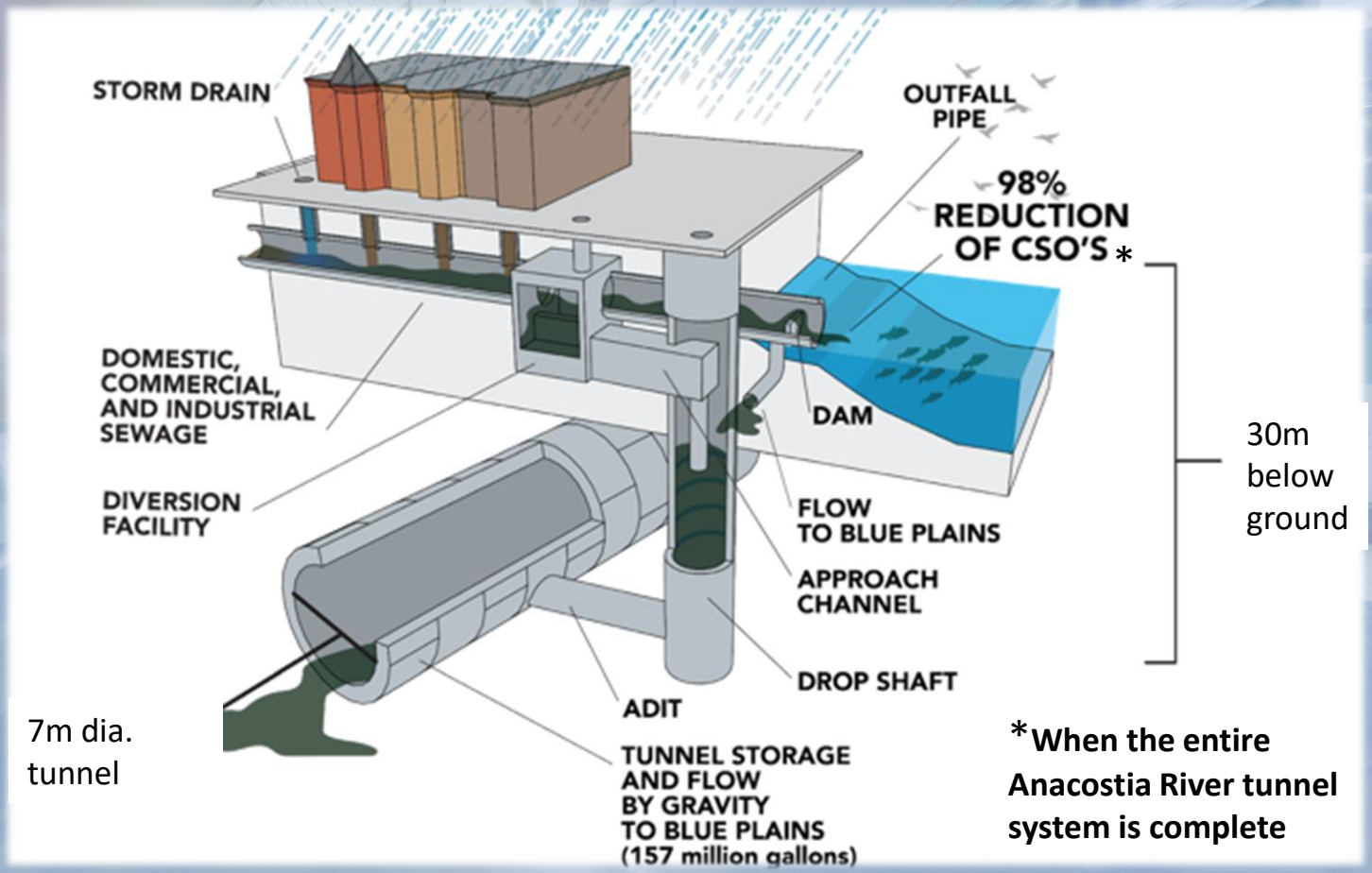
SUSTAINABILITY INITIATIVE - OF THE YEAR -

System Overview



***When the entire Anacostia River tunnel system is complete**

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SUSTAINABILITY INITIATIVE - OF THE YEAR -

Anacostia River Tunnel

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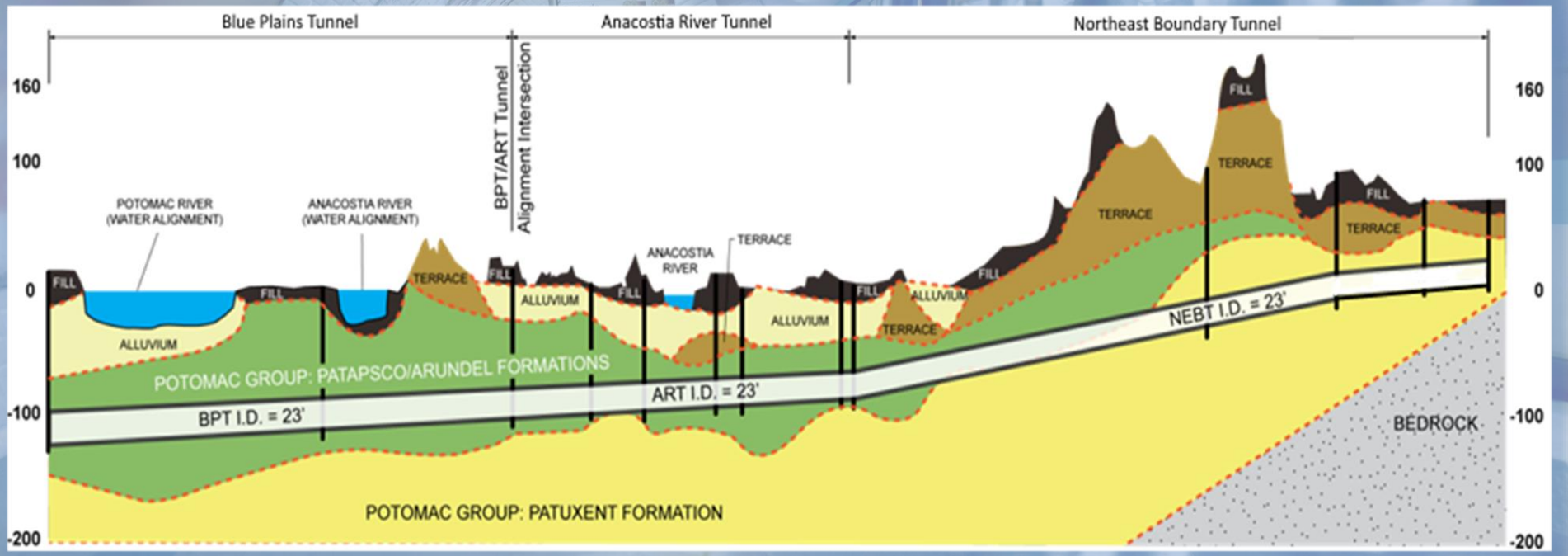
Anacostia River Tunnel System Profile



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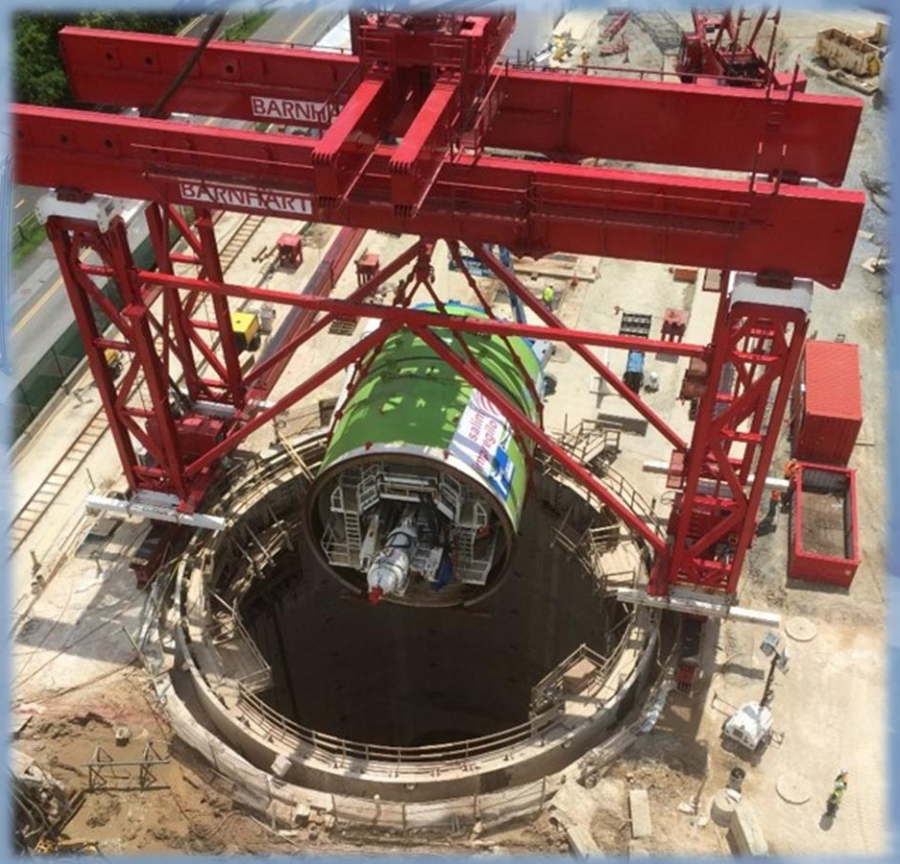
Tunnelling

- 7m dia. tunnel x 3,8km excavated with an EPB TBM
- 7m dia. tunnel x 30m excavated with Sequential Excavation Method
- 3m dia. tunnel x 100m excavated with pipe jacked slurry MTBM
- 1,4m dia. adits excavated with pipe jacking



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Sustainability Initiatives

Design/Build Phase

- 100-year design life
- Careful management of aquifers
- Reduction of carbon footprint
- Preserved integrity of all existing infrastructure
- Implemented storm water pollution prevention measures

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SUSTAINABILITY INITIATIVE - OF THE YEAR -

Minimum 100 Year Design Life

Designed all structures, including precast tunnel liner and cast-in-place structures, for minimum 100 year design life

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SUSTAINABILITY INITIATIVE - OF THE YEAR -

Shaft Construction with Slurry Walls to Protect Lower Aquifer

Placing Concrete for Guide Walls

Hydromill for Slurry Wall Panel Excavation

Primary Panel Rebar Cage Fabrication

Placing Rebar Cage for Slurry Wall Panel

Preparing Top of Slurry Wall for Capping Beam Installation

Shaft Excavation

Shaft Bottom Concrete

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SUSTAINABILITY INITIATIVE - OF THE YEAR -

Reduced Carbon Footprint

Use of fly ash in precast concrete segments to provide 100 year durability and reduce carbon footprint by reducing cement consumption

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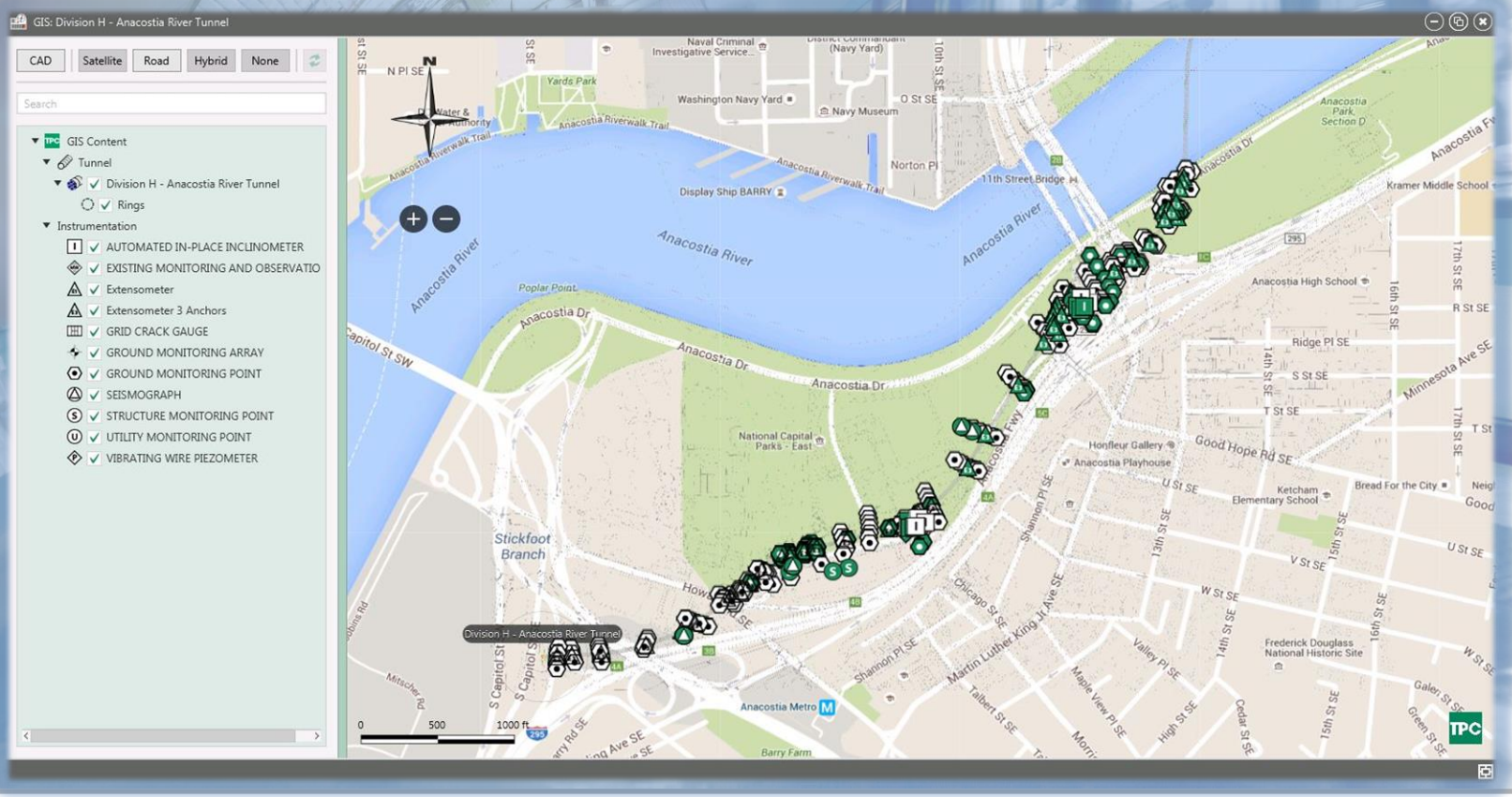
SUSTAINABILITY INITIATIVE - OF THE YEAR -

Preserved Integrity of Existing Infrastructure



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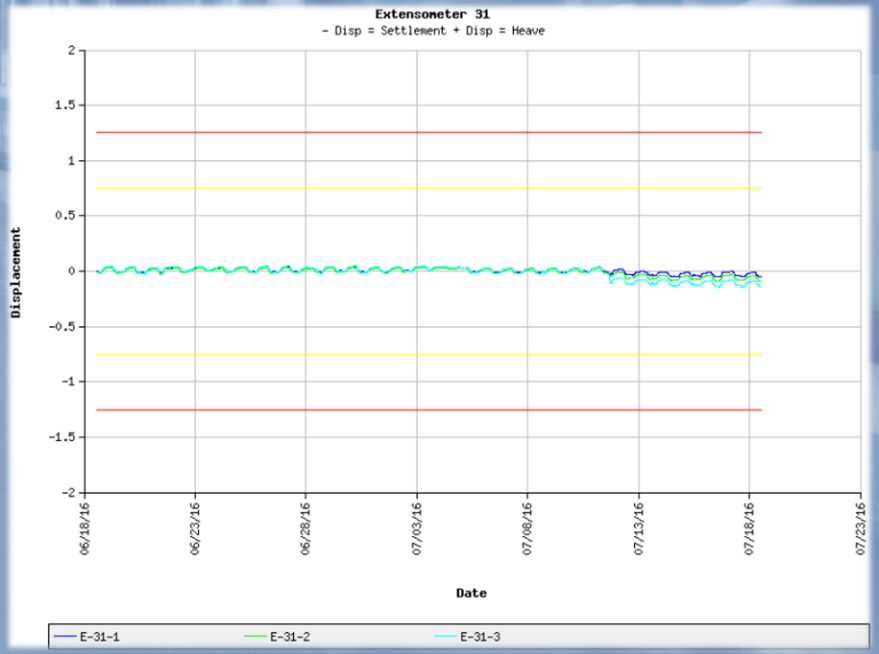
Protected Fragile Key Infrastructure



Including pressurized sewer and water mains by compensation grouting as TBM passed underneath

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Sustainability Initiatives Operations Phase

- Access to shaft sites via green infrastructure
- Hydraulic design of interceptor drop shafts, designed to operate without active control and absorb the energy of the water dropping 30m
- Ventilation/odor control structures below ground for minimal visual impact
- Reduction of CSO overflows to the Anacostia River for improved water quality

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Access Shaft Sites Via Green Infrastructure

Provide turf pavers for access to shaft sites instead of impermeable pavement

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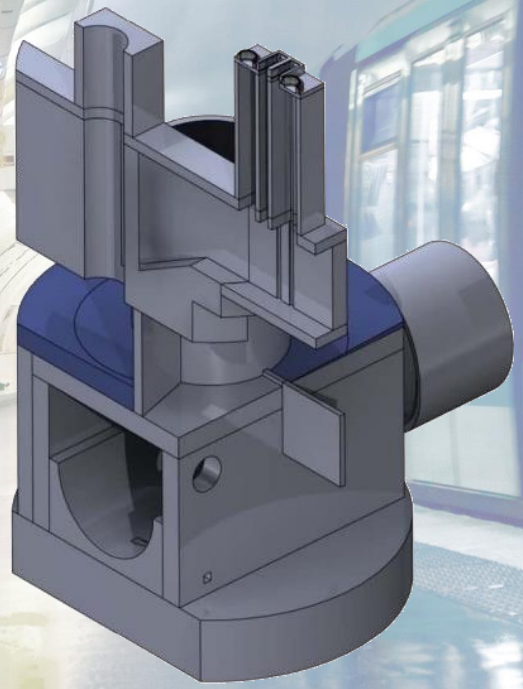
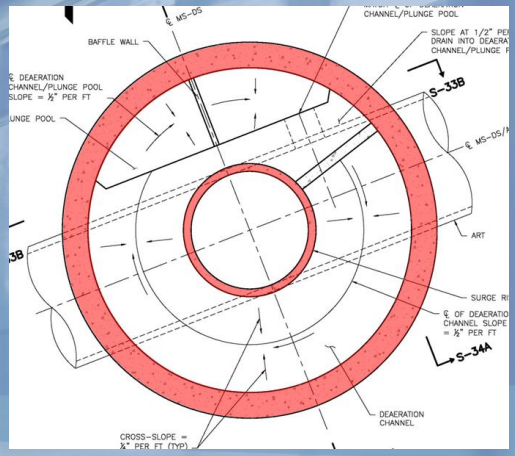
In-line Drop Shaft Design

- Constructible solution for soft-ground
- Minimize air entrained in the drop
- Allow air to vent from tunnel system
- Provide space for hydraulic transients to overflow
- Provide a relief for flows that exceed the design diversion rate
- Mitigate potential for geysers





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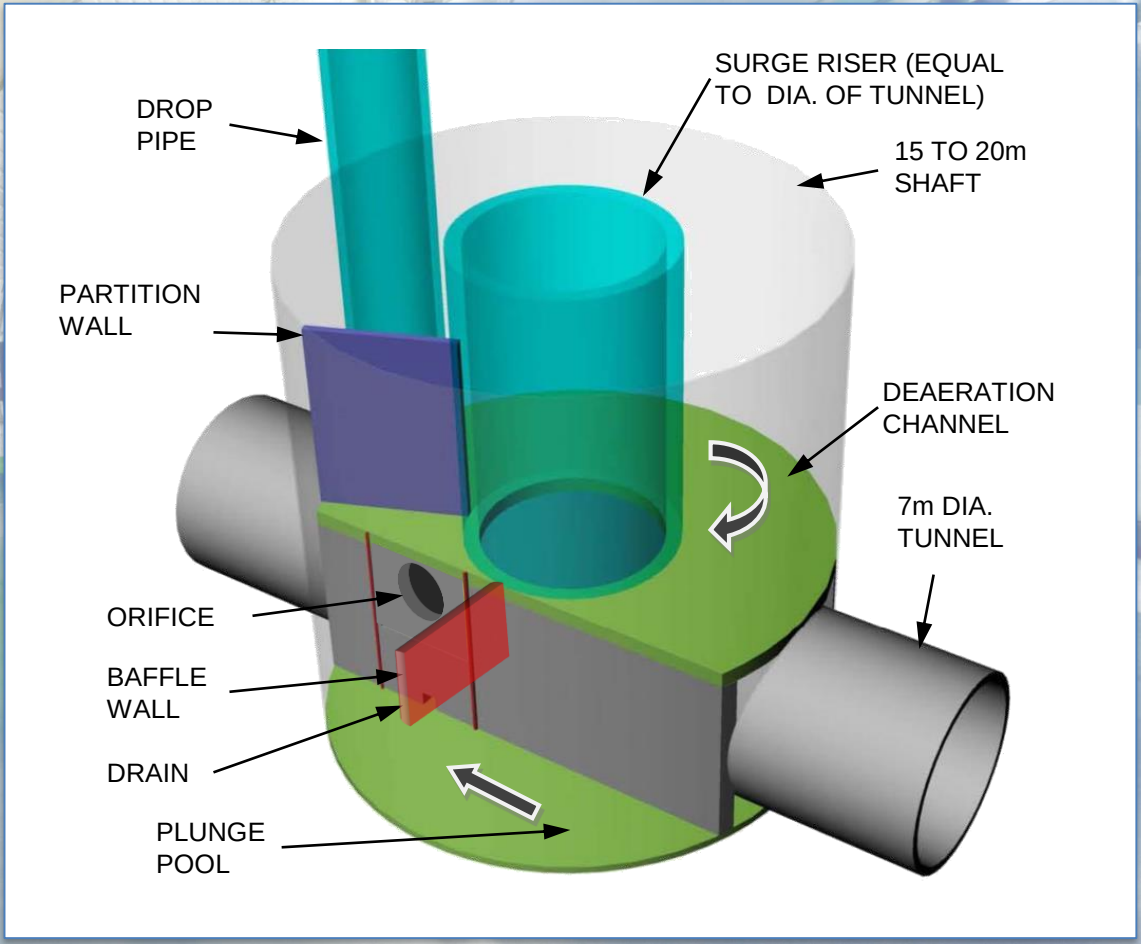
SUSTAINABILITY INITIATIVE - OF THE YEAR -

In-line Drop Shaft Design



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In-line Drop Shaft Video

SUSTAINABILITY INITIATIVE - OF THE YEAR -

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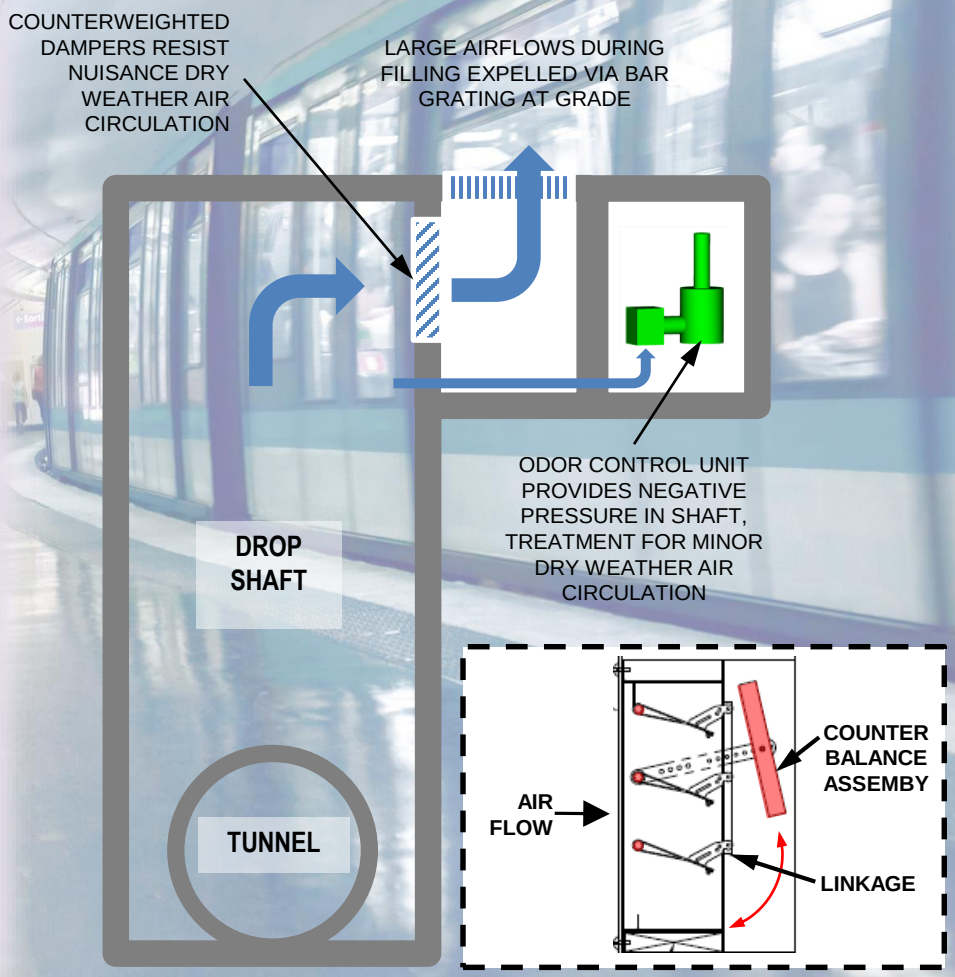
Venting and Odor Control

Ventilation

- Vents sized for maximum air flow to be exhausted during filling events
- Maximum air velocity at grade limited to prevent nuisance

Odor Control

- Tunnel accepts wet weather flows only
- Tunnel pumped down during and after storm events
- Counterweighted dampers prevent air circulation
- Radial flow activated carbon system at all shafts



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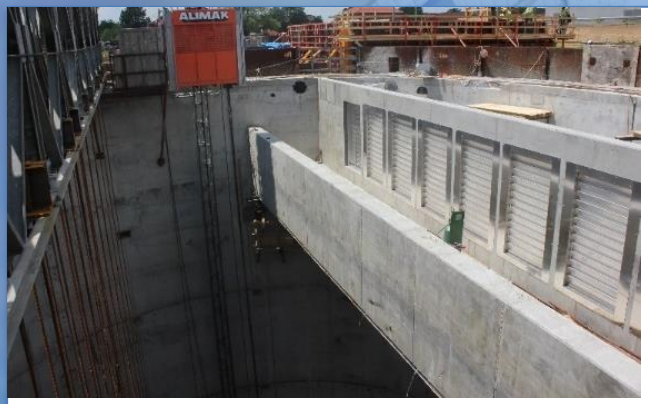
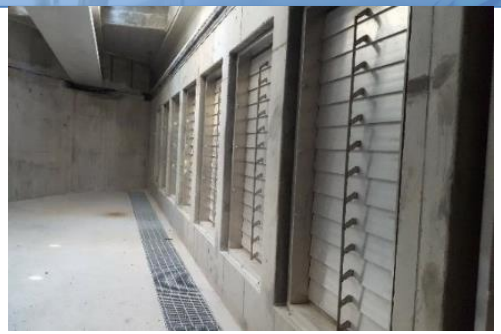
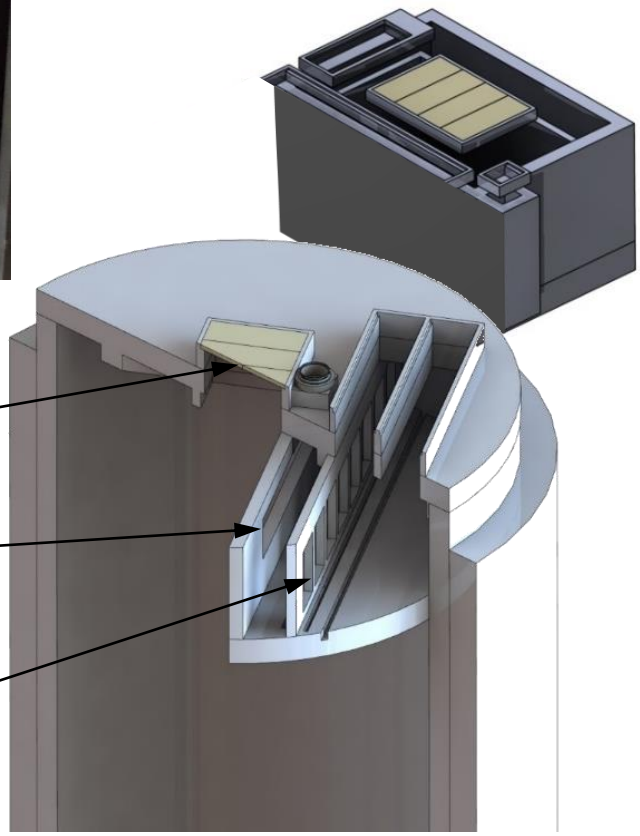
Venting and Odor Control







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82% Reduction of CSO to Anacostia River in Spring 2018 after startup of the Anacostia River and Blue Plains Tunnel Projects

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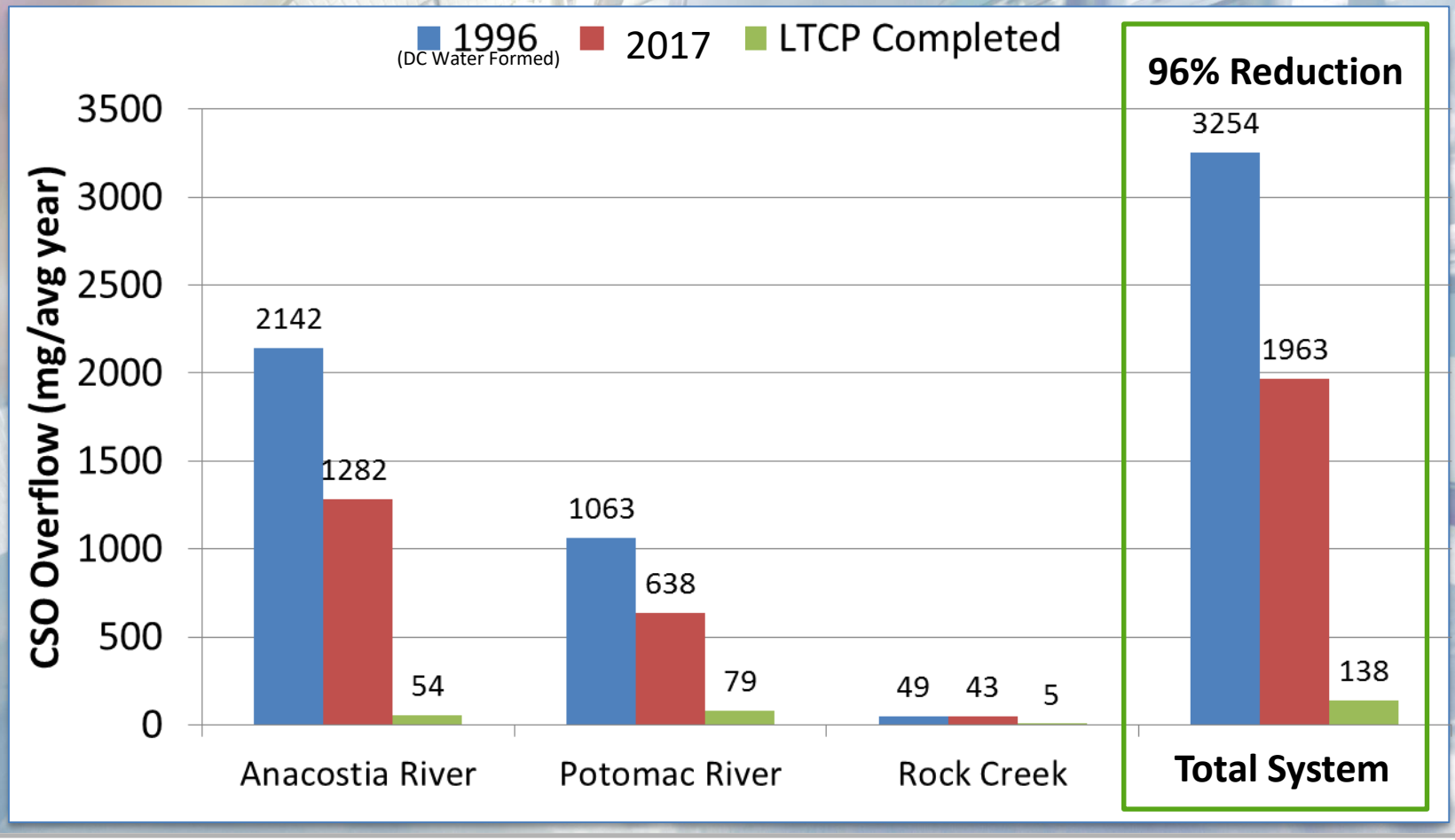
SUSTAINABILITY INITIATIVE - OF THE YEAR -

DC Clean Rivers Project Benefits



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Clean Rivers Project: Sustainability Initiative of the 21st Century for Washington, DC