Design and Installation of Innovative Stormwater Structures at Washington Navy Yard

Pollution Prevention

Sustainable Development

Tradition Stormwater Management

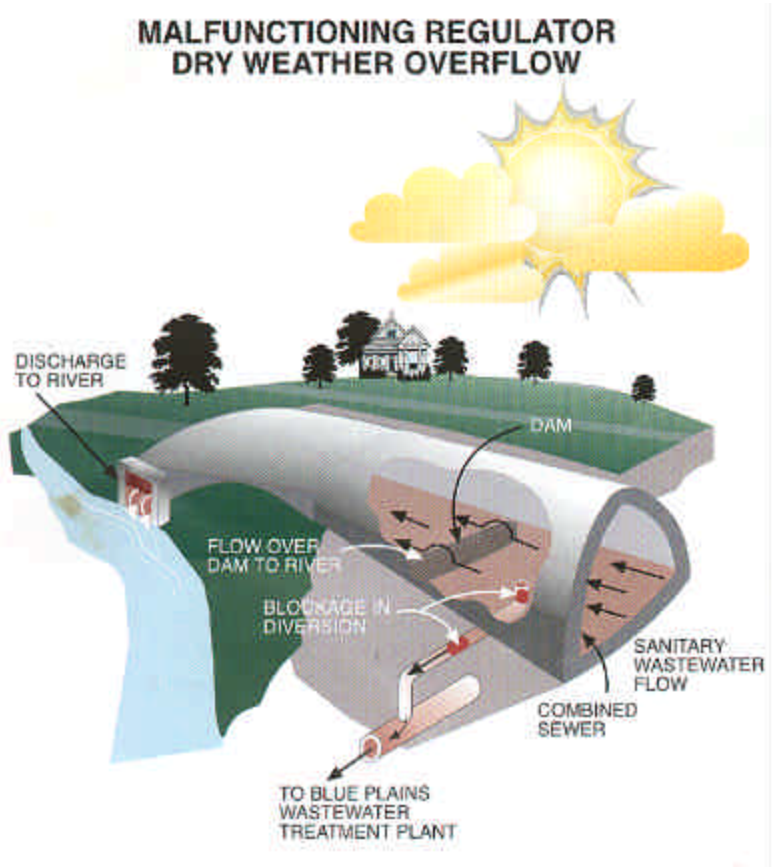
- Traditional Engineering solution - Convey the storm water as quickly to the river as possible. Treat water at the end of pipe.
- As urbanization continues (over decades) the resulting flow in rivers is a shorter duration higher peak flow causing erosion/deposition and degrade water quality (TSS, BOD, etc).

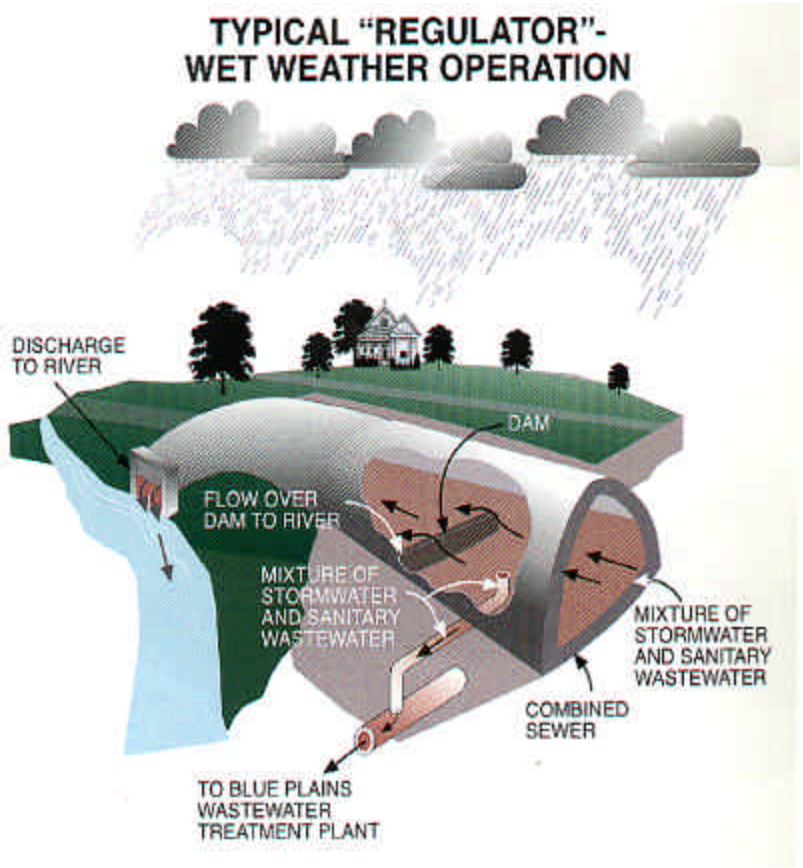
- BMPs are techniques used to control non point source discharges by means of
  - Filtering out sediments - using permeable pavers and sand/gravel beds.
  - Phytoremediation - natural indigenous plants to remove or neutralize contaminants.
  - Retention of peak storm events to reduce down stream erosion/sedimentation and improve groundwater recharge.

Benef

- Reduced irrigation
- Reduced TSS
- Reduced storm sewer network and POTW Capacity
- Improved water quality to mimic predevelopment runoff quality.
- Recharge of groundwater

Reduced CSO inf





Pilot Projects

- Willard Park Parking Area
- Street Tree Filters
- Street Sweeping Demonstration
- Roof Leader Disconnect
- Inlet Floatables Removal
- Inlet Timing Project
- Inlet Ponding Modification
- Permeable Pavers Installation

Navy Yard Retrof

Bio "Retention"

Captrue and Proceses

A major tool to maximizing the use of uplands areas for management and treatment.

Processes and Functions

Physical ***(Sedimentation / Filtration / Volatize***

Chemical ***(CE / Adsorption / Chelation ……***

Biological ***(Cycling, Uptake, Transformation…***

Hydrological ***(Evaporation /Infiltration / Timing***

Physio-chemo-bio-hydro retention

Bioretention Benef

- Restores Hydrologic Functions
- Economically Sustainable
  - Efficient Use of Space / Reduced Infrastructure
  - Property Value
  - Scale of Maintenance Burdens
  - Reduces Development Costs
- New Tool for Urban Retrofit
- Practical / Simple / Universally Applicable

BIORETENTION APPLICATIONS

- Landscape Islands
- Streetscape
- Existing Forested Areas
- Forest Fringe
- Open Space (Meadows)
- Open Swales (Off-line)
- Landscape Trees
- Gardens

"Hydrophytobiochemo-retention"

Urban Lot Level Control Opportunities

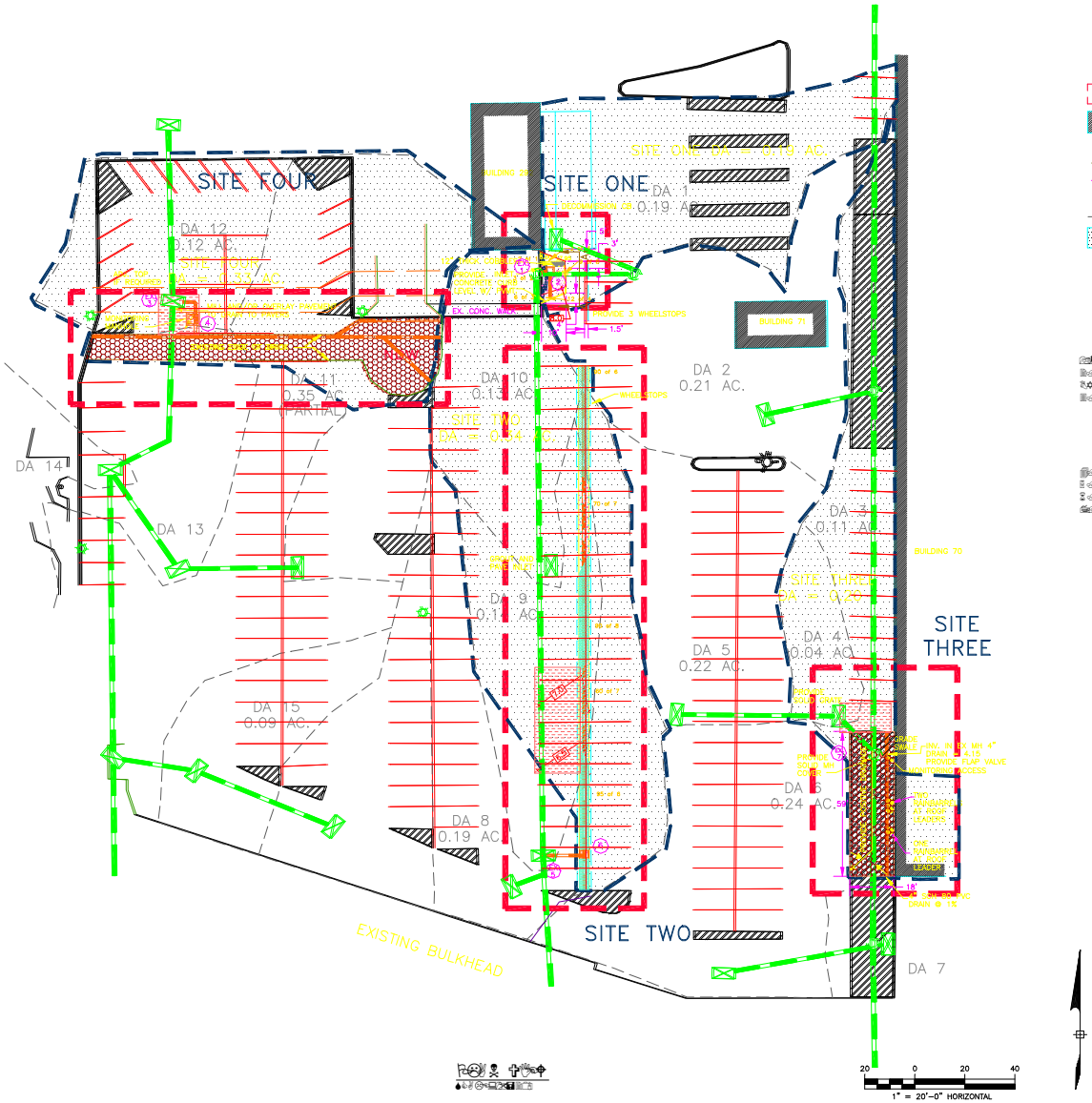
- Roofs
- Buildings
- Down Spouts
- Water Use
- Yards
- Sidewalks
- Parking
- Landscape Areas (trees / vegetation)
- Open space
- Pollution Prevention
- Conventional BMP's

Multifunctional Infrastructure

*** Receiving Water Protection / Restoration**

*** CSO Control (Flow / Frequency / Quality)**

*** TMDL' Impaired Waters**

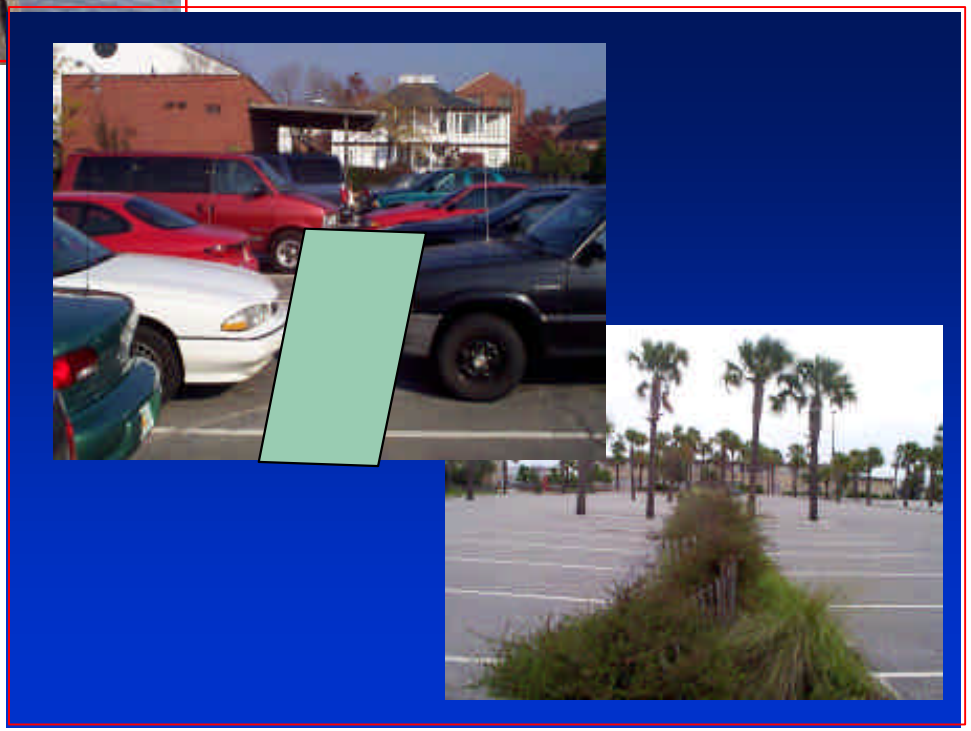


OHM Remediation Services Corp.

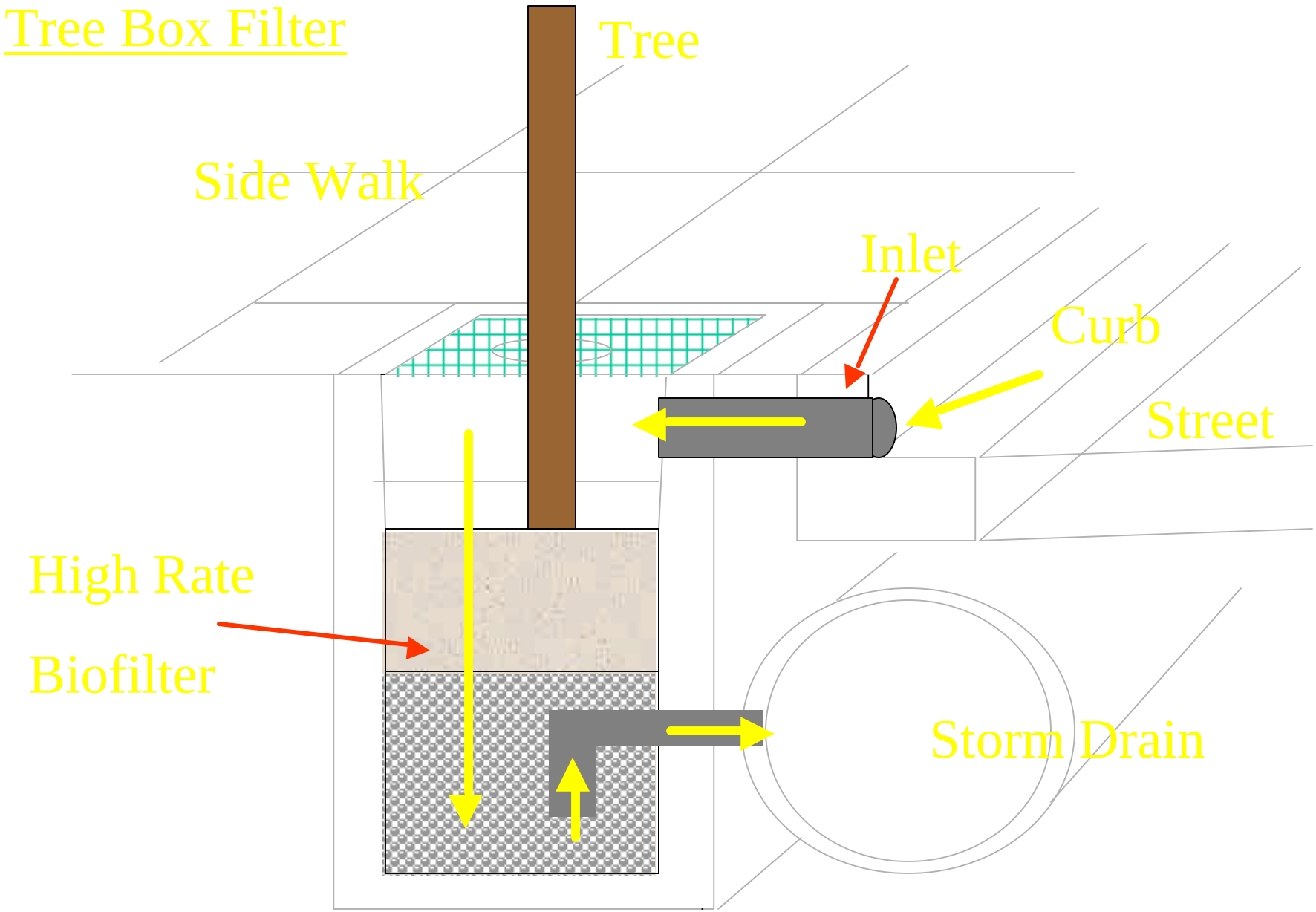
THE LOW IMPACT DEVELOPMENT CENTER, INC.

BALANCING GROWTH AND ENVIRONMENTAL INTEGRITY

Retrofit With Bio-filtration Strips



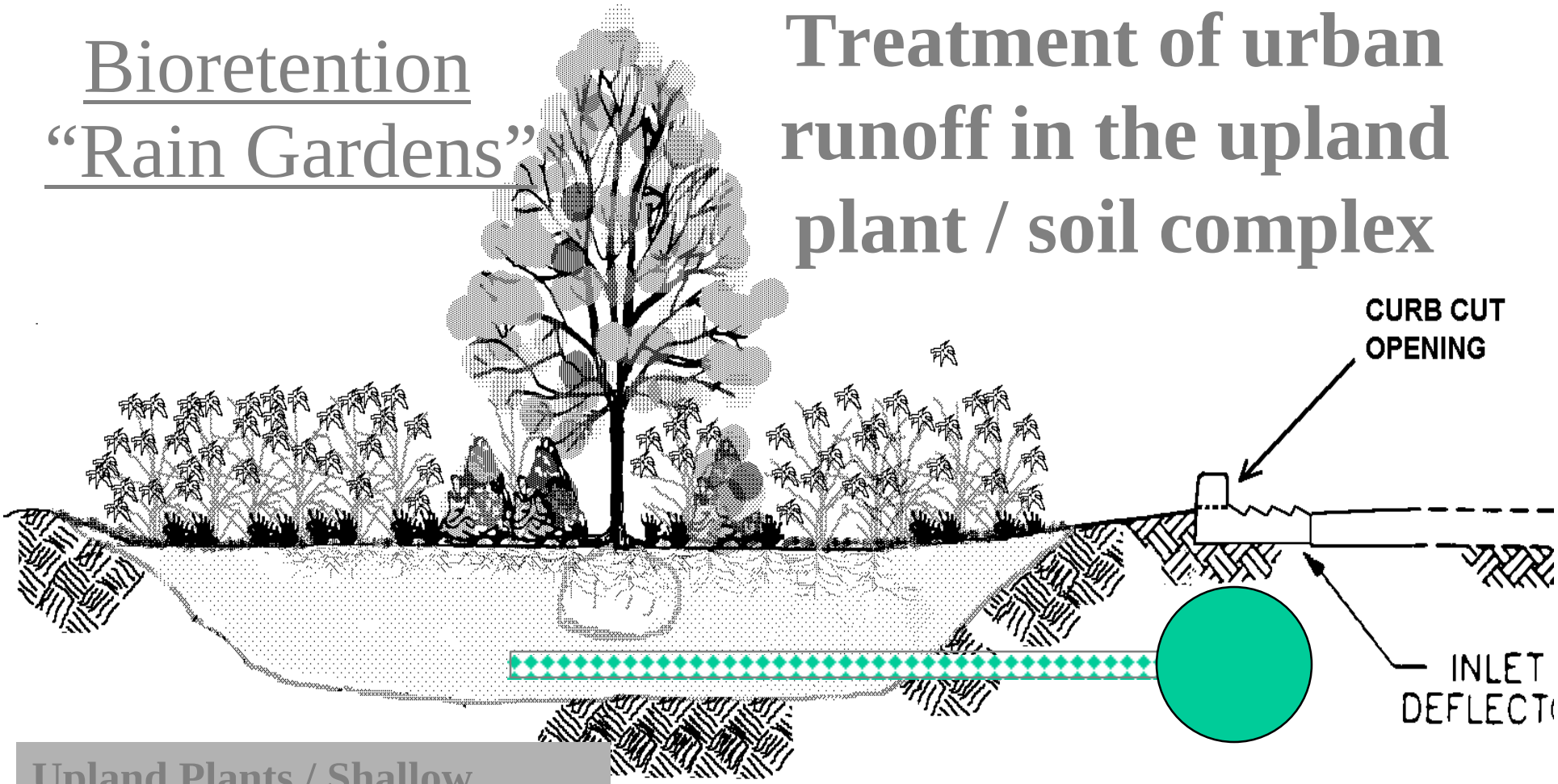
Construction of Bio Filtration Cells/Strips



TREE FILTER SCHEMATIC

Bioretention
"Rain Gardens"

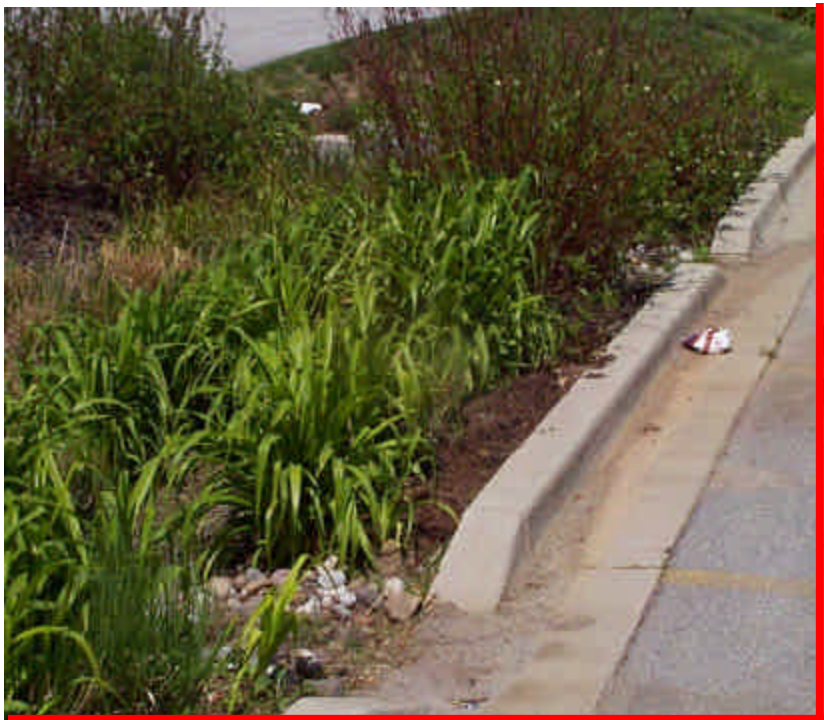
Treatment of urban runoff in the upland plant / soil complex

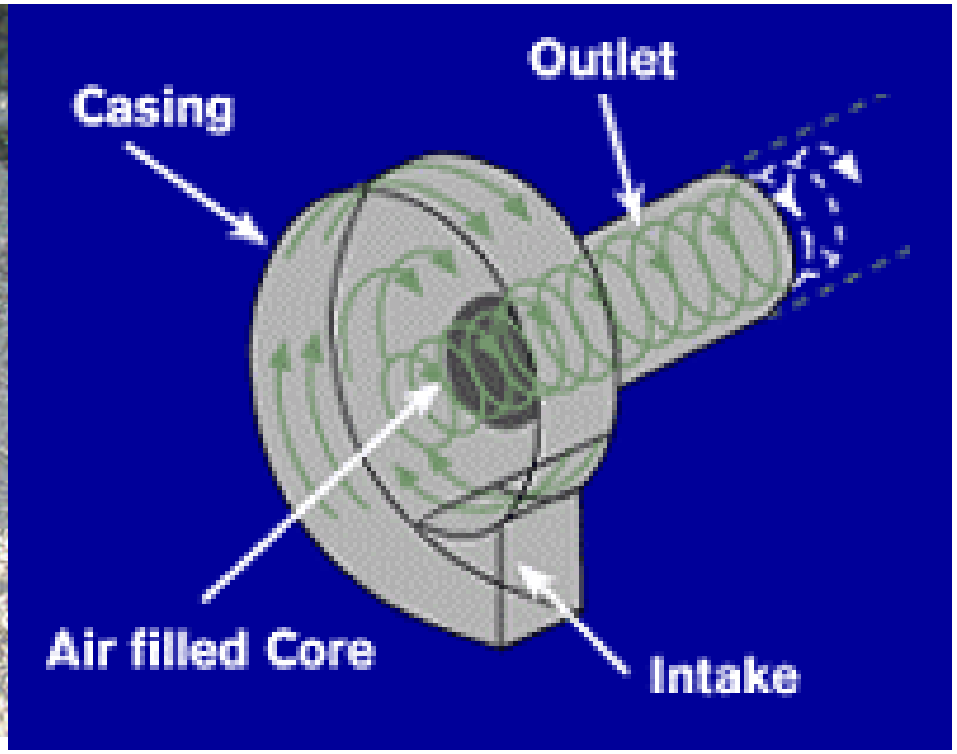


Upland Plants / Shallow Ponding Infiltration and/or Filtration Volume Control
Aesthetic Value
Habitat Value
Property Value
Low Cost Maintenance

Multifunctional use of green space

High Rate Bio-filtration





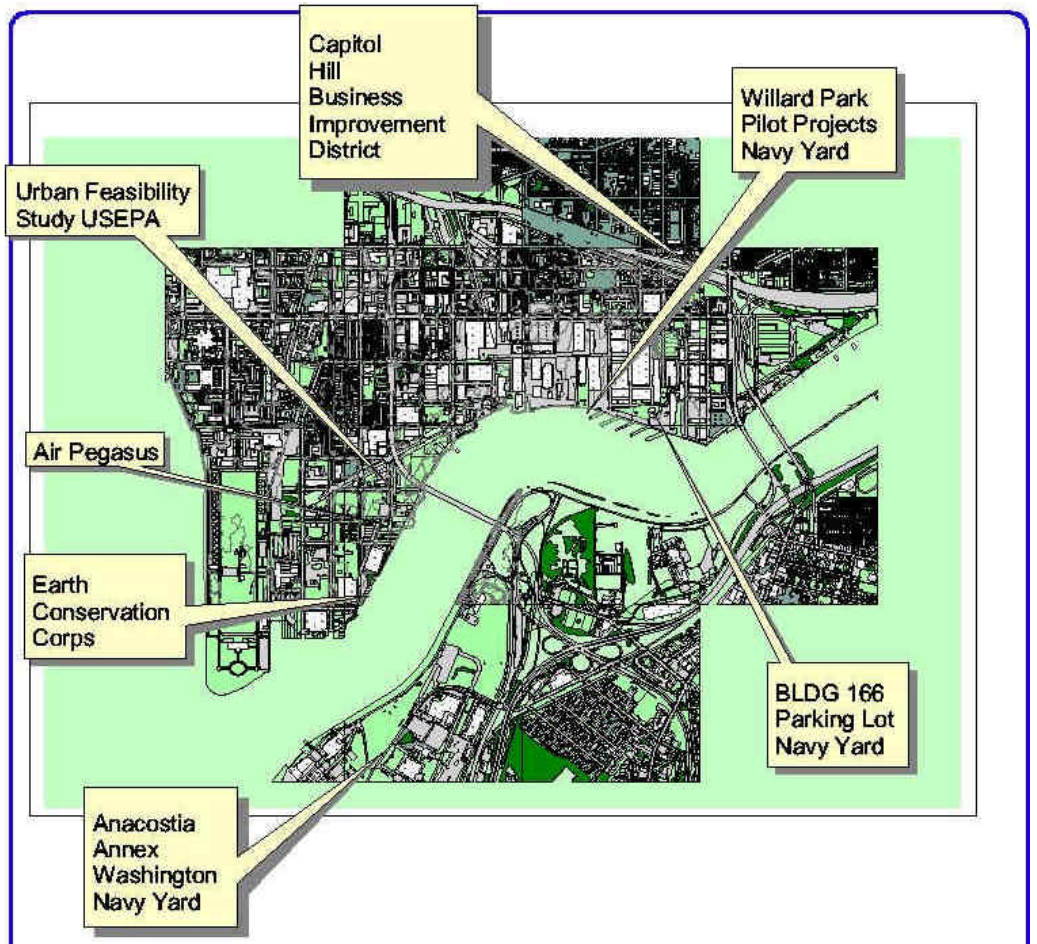
Vortex Flow Control

Installed at Structure D-3 for control of peak flows. The restricted opening reduces the peak flow rate, and eliminates debris from entering the system.

Floatables Removal

This prevents oils, grease, and trash from entering the storm drain system.

Vortex Peak Flow Reducer



D.C. Anacostia Watershed LID Projects December 2000

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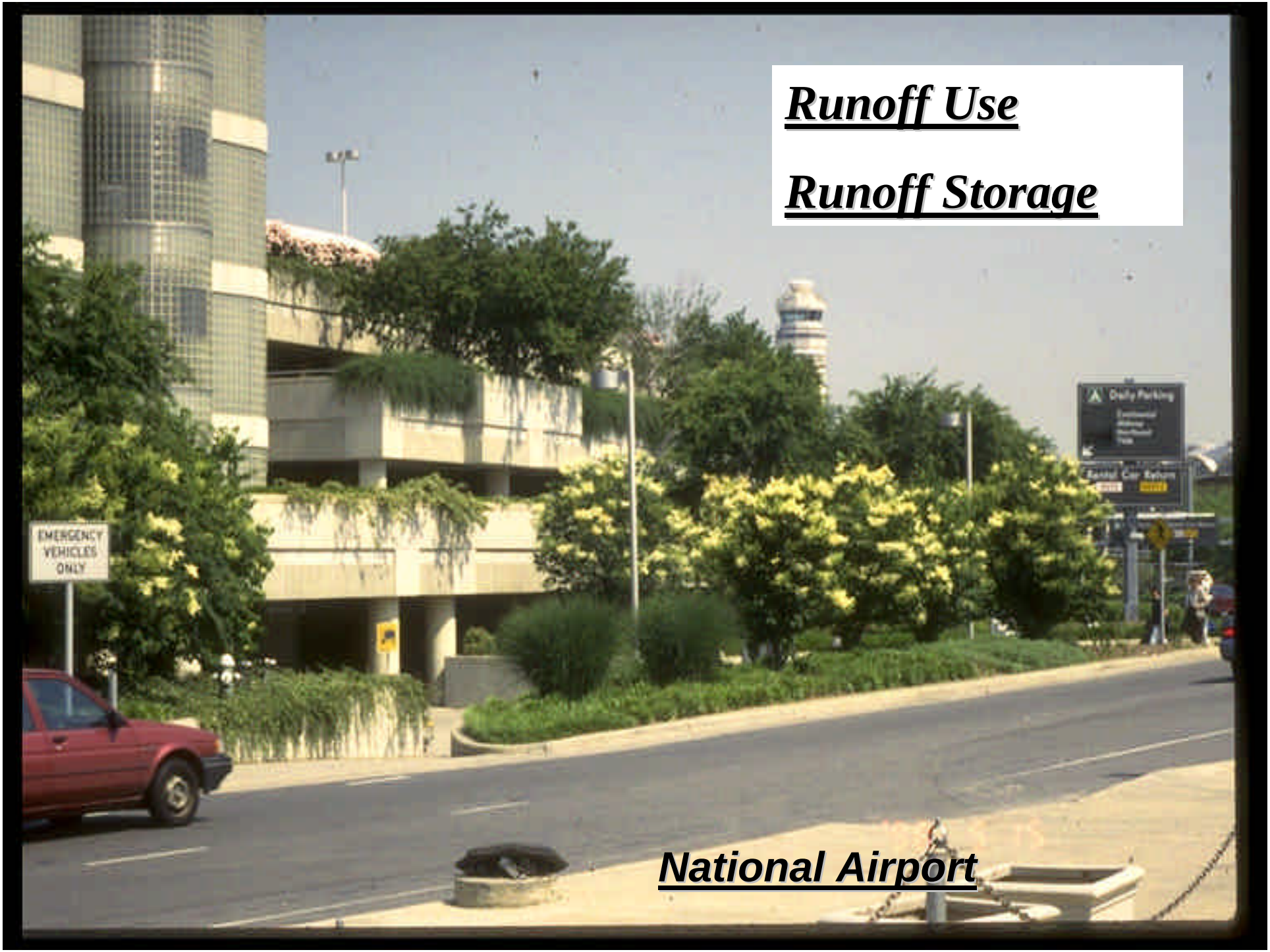
GIS Information from WGIS


Runoff Use
Runoff Storage
EMERGENCY VEHICLES ONLY
National Airport

Buildings

Downspouts
Disconnect / Water Use

Herbert Dreiseitl - ww.dreiseitl.de