Private Stormwater Facility Inspection and Rehab

by: Cary Armstrong
Clark County Public Works
Clean Water Division

History of SWFs in Clark County

- 1980: Clark County's 1st Stormwater Code
- 1994: Clark County adopts Puget Sound Stormwater Manual requiring SWFs to be constructed for new development.
- 1999: Clark County Issued Phase I NPDES Municipal Stormwater Permit
- 2000: Clark County's Clean Water Division created to manage this new stormwater permit

Public vs Private SWFs

- In Clark County – Developers Choice
- Why Private vs Public SWF?
- Pros and Cons

Types of Stormwater Facilities – Repaired Bioswale

Mature Bioswale

Bioswale with Detention Pond

Wet Swale

Treatment Wetland

Oil/Water Separator - Coalescing Plate Type

Filter Cartridge Vault

Low Impact Development

- New Stormwater Facility Technology
  - Permeable Pavement
  - Bioretention
  - Filterra Systems
  - Filter Strips
  - Full Dispersion
  - Pavers
  - Grass Filled Pavers

Permeable Pavement

Bioretention Unit

SWF Inspection

- Safety First
- Tools
- Mapping
- iPad

Set Up Safe Zone

Tools

- Lid Pullers
- Catch Basin Sediment Depth Measuring Tool
- Filter Vault Sediment Depth Measuring Tool
- Flashlight
- Sledghammer
- Machete
- Screwdriver
- Hex Socket Wrench for Vaults (Filter and O/W)

Manhole Lid Puller – with wheels

Heavy Duty

Light Weight

5’ Probe

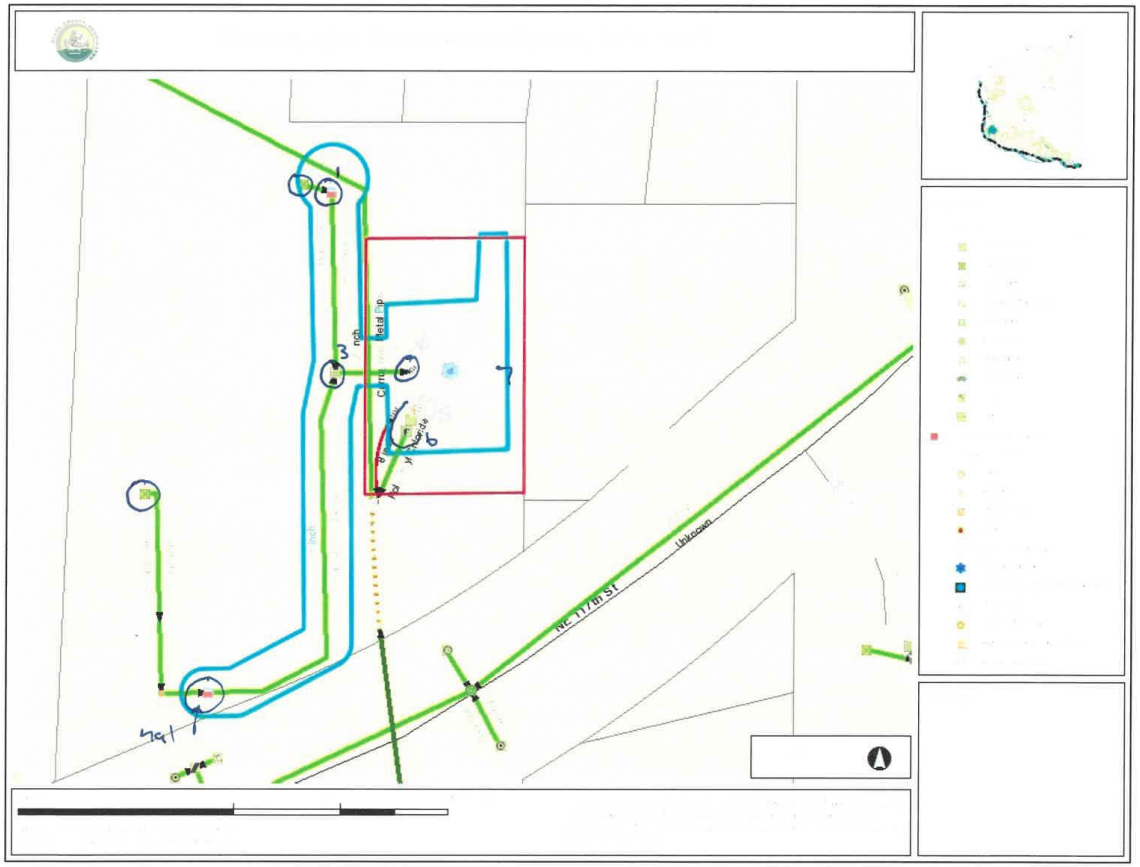
Telescoping Measuring Tool

Flashlight

Sledgehammer

Machete

Mapping



How to Perform an Inspection

- Begin Inspection Where Stormwater Enters the Facility
- Inspect Each Stormwater Facility Asset
- Mark Down all Defects
- Take Photos
- Enter Data into iPad

Stormwater Facility Assets

- Inlet Pipe
- Sediment Trap with Trash Screen
- Energy Dissipator
- Bioswale and Detention Pond
- Field Inlet
- Control Structure
- Discharge Point

Inlet Pipe

Sediment Trap with Trash Screen

Sediment Trap with Trash Screen

Energy Dissipator

Bioswale with Detention Pond

Field Inlet

Control Structure

Inside Control Structure

Discharge Point

Common SWF Defects

- Accumulated Sediment in Catch Basins
- Accumulated Sediment in Sediment Trap
- Lack of Vegetation in Bioswale
- Bioswales filled with Rock
- Grass too long in Bioswale – not being mowed
- Sediment Build up in Bioswale
- Sediment Build up in Energy Dissipator

Common SWF Defects

- Noxious Weeds, especially blackberries
- Channelization in Bioswale
- Volunteer Trees Growing on Berms
- Discharge Point Overgrown with Vegetation
- Stormwater Filters Need Replacing from Sediment Overload
- Permeable Pavement no Longer Permeable
- Bioretention – Dead Plants

Sediment in Catch Basin

Sediment in Sediment Trap

Lack of Vegetation in Bioswale

Channelizing in Bioswale

Bioswale Filled with Rock

Sediment Build Up in Bioswale

Sediment over Energy Dissipator

Noxious Weeds - Blackberries

Volunteer Trees Growing on Berm

Volunteer Trees Impacting Assets

Trash and Debris

Discharge Point Overgrown with Vegetation

Stormwater Filters Need Replacing

Permeable Pavement - Failure

Permeable Asphalt – Failure Cont’d

Bioretention – Dead Plants

Questions???