

STORM WATER MANAGEMENT

February 21, 2015

Prince William County

Department of Public Works

Environmental Services Division

Watershed Management Branch



Storm Water Management

- Storm Drainage Systems
- Storm Water Management Facilities
 - What they are
 - Different Types
 - Maintenance Responsibilities
 - Prince William County
 - Property Owner

Storm Water Management

- Questions for Audience
 - Representing HOA?
 - Community Manager?
 - Commercial Property?

Storm Water Runoff



- Storm water describes water from precipitation
 - Rain, snow, sleet, or snow melt
- Results in surface runoff
 - flows into storm drainage systems, local streams and rivers
 - Chesapeake Bay

Government Regulations

- **Federal**
 - Clean Water Act - EPA
- **Federal/ State**
 - National Pollutant Discharge Elimination System (NPDES) permit program - EPA and Va DEQ
 - Municipal Separate Storm Sewer System (MS4) Permit
- **State**
 - Storm Water Management Program – DCR
 - Chesapeake Bay Act
- **Prince William County**
 - Storm Water Management Regulations

Storm Drainage Systems

- System that conveys storm runoff
- Above ground
 - Ditches, channels, streams, swales
- Underground
 - Piped system
 - Curb inlets, Yard inlets, Manholes, Culverts
- Typically flows to storm water management facility
- Easements (shown on subdivision plat)
- Approved by PWC
- Constructed by developer
- Not combined with sanitary sewer

Storm Drainage Systems



Curb Inlet



Drop Inlet and Swale



Channel



Piped System

Storm Drainage Systems

- Maintenance Responsibilities
 - Determined by PWC DCSM at plan approval stage
 - Residential Developments (SF, TH, Condo)
 - PWC has major maintenance within easements
 - Structures – Inlets, Pipes, Culverts
 - Rip rap (erosion control stone)
 - Major erosion/sedimentation
 - PWC responsibility begins at bond release
 - PWC inspections (post construction)
 - VDOT maintains systems in the right-of-way
 - Owner/HOA has maintenance of:
 - Mowing/trimming
 - Trash and small debris removal
 - Trees/landscaping
 - Repaving surfaces
 - Areas not covered by drainage easements

Storm Drainage

Common problems

Common Drainage Problems



Erosion around inlets

Drainage Problems



Erosion at pipe outfalls

Drainage Problems



Trash/leaves/debris block flow

Drainage Problems



Blocked inlet/drainage system

Drainage Problems



Blocked yard inlet/ yard flooding

Drainage Problems



Woody vegetation above pipe

Drainage Problems



Woody vegetation in outfall channel

Storm Drainage

- Recommendations for property owners
 - Pick up trash/debris before it enters drain system
 - No dumping of leaves/grass clippings into drainage system
 - Do not plant trees over the pipe system/ easement
 - Remove debris/trash from ditches or channels
 - Cut/remove woody vegetation from improved channels and above drainage pipes

Questions on Storm Drainage?

Storm Water Management Facilities

- Required per State and County standards
- Provide storage for storm water runoff
- Peak runoff from site does not exceed pre-development rate
- Prevent flooding downstream, slows runoff
- Water quality
- Filter out pollutants by allowing sediment and nutrients to settle
- Reviewed/Approved by PWC
- Constructed by developer
- Easement dedicated to PWC



Storm Water Management Facilities

- Types of SWM:
 - Dry Detention Facilities
 - Wet Retention Facilities
 - Trench
 - Bioretention (rain garden)
 - Underground Facilities
- 850 County maintained facilities
 - Shared maintenance responsibilities
- 900 Privately maintained facilities

Storm Water Management Facilities

- Maintenance Responsibilities
 - Determined by DCSM at plan approval
 - Note on plat/ deed
- Residential Developments - SF, TH, Condo
 - Most facilities PWC has major maintenance within easements
 - Structures – Pipes, Riser/control structure
 - Rip rap (large stone)
 - Major erosion/sedimentation
 - Standing water
 - Fences/gates
 - Beaver removal
 - PWC responsibility begins at bond release
 - Yearly inspections

Storm Water Management Facilities

- Shared Maintenance Responsibilities
 - Owner/HOA has maintenance of:
 - Mowing / trimming
 - Trash and small debris removal
 - Trees / landscaping
 - Nuisance vegetation (algae, cattails)
 - Fountains/aerators

Dry Detention Pond



- Most common
- Holds water during and after storm event
- Water can rise quickly
- Extended detention 48-72 hours
- Emergency spillway
- Fencing required for most dry ponds
- Warning signs required

Dry Detention Pond



Owner/HOA Responsibilities:

- Mowing / trimming
- Dam Embankment – no trees
- Around/above drainage structures
- Recommend bushhog 2x/year
- Remove shrubs/branches from fence
- Trash and small debris removal
- Trees / landscaping
- Nuisance vegetation (cattails)

Dry Pond



Well maintained

Dry Pond



Dry Pond



Embankments need cut

Dry Pond



Downstream embankment needs cut

Dry Pond



Emergency spillway

Dry Pond



Trim/Remove trees from fence

Dry Pond



Standing water/ litter

Wet Retention Pond



- Permanent pool of water
- Water level rises with storm
- No fencing required if conditions met
- Usually safety/aquatic bench on perimeter
- Warning signs required
- PWC - major maintenance on some wet ponds
 - Per note on plat/plan
- Recommend vegetative strip along pond edge

Wet Retention Ponds



- **Owner/HOA Responsibilities:**
 - Mowing / trimming
 - Dam Embankment – no trees
 - Around drainage structures
 - Trash and small debris removal
 - Trees / landscaping
 - Nuisance vegetation (cattails, algae)
 - Geese control

Wet Pond



Well maintained

Wet Pond



Wet Pond Embankment



Before mowing

Wet Pond Embankment



After mowing

Wet Pond



Note: vegetation removed from fence

Wet Pond Litter/Debris



Owner's responsibility to remove

Wet Pond Algae



- Excess nutrients
 - Fertilizer, animal waste, and detergents
- Algae growth depletes oxygen levels
 - Loss of aquatic wildlife
 - Odor
- Prevention
 - Grass or vegetation filter strip
 - Nutrient management – limit fertilizer
- Removal
 - Chemical
 - Mechanical
- Fountain/Aerator may help

Cattails



- Usually wet pond
- Some areas of dry ponds
- Water depth of up to 1.5 feet
- Mechanical or chemical treatment
- Difficult to eradicate
- Owners decision to treat

Beaver/Muskrat Problems



- Can cause extensive damage
- PWC will trap if affecting stream or pond function
 - In County easement
- Request signed affidavit from owner

Trench



- Excavated trench filled with stone
- Stores storm water runoff and filters into soil below
- Smaller sites
- Not many in PWC
- Maintenance resp. per note on plat
- Owner maintenance – cut back vegetation

Bioretention (Rain Garden)



- Used on smaller sites
- Usually less than 500 sf
- Landscaping feature that uses native vegetation
- Filters out pollutants from storm water runoff

- Engineered soils for percolation
- Relatively new for water quality
- Most sites maintained by property owner
- General maintenance – weed/mulch/prune

Owner Access to SWM Ponds



- PWC lock installed at ponds under Co. “major” maintenance
- PWC can provide key to owner/HOA
- Call Watershed Management Branch
- 703-792-7070

Mosquito Problems



- PWC Forest and Pest Management
 - Inspect
 - Larvae Count
 - Provide treatment as necessary
 - 703-792-6279

Maintenance Agreements

STORMWATER/BMP FACILITIES MAINTENANCE AGREEMENT

THIS AGREEMENT, made and entered into this 24 day of January, 2012
by and between OSCEOLA MANAGEMENT LLC, hereinafter called the "Landowner(s)", and
the Prince William Board of County Supervisors, hereinafter called the "County".
"Landowner(s)" also includes its (their) successors and assigns.

WITNESSETH, that


201403120015350
Prince William County, VA Pgs. 7
3/12/2014 9:30:41 AM
Nichole B. McGuinn, Clerk

WHEREAS, the Landowner owns certain real property described by GPIN 7596-80-2528
as recorded by deed in the land records of Prince William County, Virginia, by Instrument
Number 201307090069935 hereinafter called the "Property"; and

WHEREAS, the Landowner is proceeding to build on and develop the property; and

WHEREAS, Site Plan (Hornbaker Industrial Park Phase 3 Lots 5A2A - PWC #14-00050
R00) hereinafter called the "Plan", which is expressly made a part hereof, as approved or to be
approved by the County, provides for pre-treatment of storm water runoff within the confines of
the property; and

WHEREAS, the County and the Landowner, agree that the health, safety, and welfare of
the residents of Prince William County, Virginia, require that on-site stormwater
management/BMP facilities be constructed and maintained on the property; and

WHEREAS, the County requires that on-site stormwater management/BMP facilities as
shown on the Plan be constructed and adequately maintained by the Landowner:

NOW, THEREFORE, in consideration of the foregoing premises, the mutual covenants
contained herein, and the following terms and conditions, the parties hereto agree as follows:

- Required for owner-maintained SWM facilities
- Legal/Recorded document between PWC and property owner
- Facility must be maintained per approved plan
- Inspection and maintenance reports submitted to PWC
- Transfers with sale of property

Summary/ SWM Do's and Don'ts

- Do:
- Mow and trim (especially embankment/fence)
 - Remove trash
 - Visually inspect periodically
 - Contact PWC if problem
- Don't:
- Alter pond without PWC approval
 - Plant trees on dam embankment
 - Dump grass clippings or tree branches into pond

Can Do

- Add landscaping if it doesn't interfere with function of pond
- Add vegetative strip along pond edge
- Add fountains or aerators - Owner responsibility to install and maintain

Proposed Modifications in Easements

- Fences, Landscaping, Fountains, etc.
- Requires approval from Public Works
- Application form, details, supporting documents
- Public Works will review
- Approval requires conditions

Problems or Questions

Call PWC Public Works

703-792-7070

Questions?