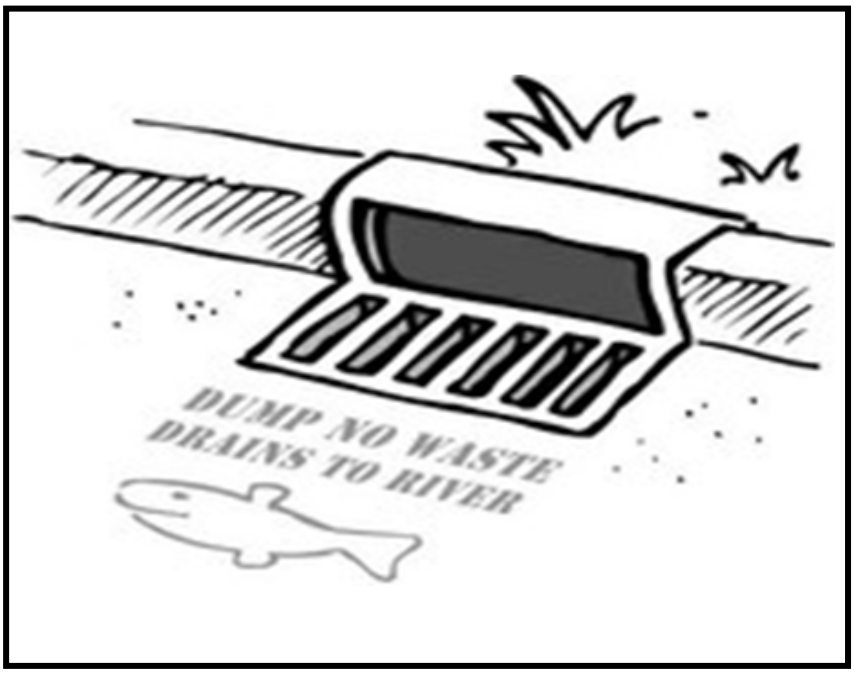
Drainage System Maintenance



Drainage Maintenance Goals

- Keep channels and basins clear of debris
- Maintain flood carrying and storage capacity
- Protect water quality

Introduction and Purpose

Pequannock's storm water collection systems are comprised of a variety of structural controls (e.g., catch, basins, manholes, storm drains, flood gates and outfalls) that convey storm water from impervious surfaces to receiving waters. This standard operating procedures (SOP) is intended to maintain the conveyance of storm water and urban runoff; protect property from flooding during high-flow storm events; control stream bank erosion; protect water quality by filtering pollutants from urban runoff; and sustaining wildlife.

Scope

This SOP specifies responsibilities and procedures necessary to keep channels and storage basins clear of debris in order to maintain their flood carrying and storage capacity during flood events and to protect water quality in Pequannock Township.

Inlet/Catch Basin Maintenance

Catch basins are subsurface concrete basins that receive water through a metal or slotted grate. These basins can also be round concrete chambers, manholes, which contain flow control and/or water quality devices. The catch basin's primary function is to convey flow while filtering debris and sediment to prevent these items from transferring and clogging the piped collection system downstream.

Inspections

- Routine inspection is completed on an annual basis for each catch basin.
- Additional inspections are required upon receiving ant complaints.
- The depth of sediment accumulation is noted in the field notes. If sediment depths are greater than ½ the capacity then maintenance is required.

Inspections (Cont.)

- The structure is checked for structural integrity and/or damage for the following items:
  - Inlet condition is flowing and free from any blockages
  - Evidence of infiltration including drips or water flowing into structure at joints and/or grouting and evidence of discoloration above the sump indicating former water intrusion.
  - Cracks and deterioration of the structure or grouting including rotting of concrete structure, exposure of rebar or structural matting, discontinuous sections in the grout.
  - Structural integrity including barrel sections is in good alignment, grade rings show no evidence of cracking, lifting, or movement.
  - Signs of abrasion and/or corrosion and deterioration of pipes.

Maintenance Procedures

- Remove sediment using vactor truck. If repairs and/or maintenance are required, record the condition and transfer to the DPW work log for prioritization and scheduling.
- If repairs and/or maintenance are required, record the condition and transfer to the DPW work log for prioritization and scheduling:
  - Remove inlet blockage.
  - Record and/or photograph infiltration condition for DPW work log.
  - Record and/or photograph cracks and deterioration for DPW work log.
  - Record and/or photograph structural integrity for DPW work log.
  - Record and/or photograph corrosion or abrasion for DPW work log.
- Maintenance is performed as determined by the amount of sediment accumulation. Maintenance requirements are logged after inspection, noted, and prioritized on the DPW work log, and maintenance activities are completed as warranted by the priority assigned.

Manhole/Pipe Maintenance

Manholes allow surface access to underground utilities and piping conveyances for inspection and maintenance operations. Pipes within the storm water system convey storm water flow to receiving bodies of water.

Inspections

- Routine inspection of manholes and associated weirs and pipes are completed on an annual basis.
- Additional inspections are required upon receiving ant complaints.
- The depth of sediment accumulation is noted in the field notes. If sediment depths are greater than ½ the capacity then maintenance is required.
- The structure is checked for structural integrity and/or damage for the following items:
  - Inlet condition is flowing and free from any blockages
  - Evidence of infiltration including drips or water flowing into structure at joints and/or grouting and evidence of discoloration above the sump indicating former water intrusion.

Inspections (Cont.)

- Cracks and deterioration of the structure or grouting including rotting of concrete structure, exposure of rebar or structural matting, discontinuous sections in the grout.
- Structural integrity including barrel sections is in good alignment, grade rings show no evidence of cracking, lifting, or movement.
- Signs of abrasion and/or corrosion and deterioration of pipes.

Maintenance Procedures

- Remove sediment in manhole or pipes using vactor truck.
- If repairs and/or maintenance are required, record the condition and transfer to the DPW work log for prioritization and scheduling:
  - Record and/or photograph infiltration condition for DPW work log.
  - Record and/or photograph cracks and deterioration for DPW work log.
  - Record and/or photograph structural integrity for DPW work log.
  - Record and/or photograph corrosion or abrasion for DPW work log.
- If the sediment level in pipes is more than ½ full, schedule the pipes to be jetted and cleaned. Please see Pipe Jetting/Cleaning below for detail.
- Maintenance is performed as identified during inspections.

Pipe jetting & Cleaning

Pipe jetting and cleaning is the process of bending a high pressure water nozzle through a pipe, beating debris and sediment from the pipe. Sediment and debris is collected and removed through an access point via vactor truck. Material is disposed on consistent with local codes and regulations.

Inspections

- Pipes are inspected during routine manhole inspections (see SOP for Manhole Inspection of Pipes and Weirs).
- Additional inspections are required upon receiving ant complaints.
- The depth of sediment accumulation is noted in the field notes. If sediment depths are greater than ½ the depth the pipe is cleaned by jetting.
- The structure is checked for structural integrity and/or damage for the following items:
  - Evidence of infiltration including drips or water flowing into structure at joints.
  - Cracks and deterioration of the structure.
  - Structural integrity is in good alignment, with no evidence of shifting, shearing, cracking, lifting, or movement.
  - Signs of abrasion and/or corrosion.

Maintenance Procedures

- Remove sediment using vactor truck. Place a downstream bladder to collect water and sediment to ensure sediment plumes are not released into receiving water. Dispose of sediment from the vactor truck at the sedimentation basin at the DPW yard.
- If repairs and/or maintenance are required, record the condition and transfer to the DPW work log for prioritization and scheduling:
  - Record and/or photograph infiltration condition for DPW work log.
  - Record and/or photograph cracks and deterioration for DPW work log.

Maintenance Procedures (Cont.)

- Record and/or photograph structural integrity for DPW work log.
- Record and/or photograph corrosion or abrasion for DPW work log.

- Maintenance is performed as identified during inspections.

Drainage Ditch Maintenance

Cleaning and shaping ditches to restore proper cross-section and flow line to prevent damage to buildings, roads, and other infrastructure from small, frequent storms. In Pequannock it is vital to maintain the functionality of open channels and culverts to minimize flooding during moderate and/or severe storms.

Inspections

- Drainage ditches are inspected as part of the Stormwater Management Coordinator's activity. Inspection will be conducted monthly and after any major storm event.
- Drainage ditches are inspected for proper cross-section, flow line, and debris accumulations. Ditches that need cleaning but are not creating any immediate problems are noted and are scheduled for cleaning when resources become available.
- Action is taken immediately if drainage ditches are found to be noticeably clogged where flooding to either the roadway or private property is probable. This emergency type work is prioritized in advance of any routine drainage work.
- The DPW Supervisor, crew, floodplain committee and general public monitor drainage ditches year-round for problems. Most inspections and work occurs during the summer when problems are most apparent. Typically maintenance is required during the spring when the ice and snow are melting or during rainstorms.

Maintenance Procedures

- Drainage crews are sent to known problem areas first. Once these problematic areas have been addressed, an attempt is made to clean an entire route at once and to systematically work through the entire system, as equipment and resources are available.
- Drainage ditches are considered operational if they are not creating a significant drainage problem. Drainage ditches are considered clean when approximately 95% of the brush and sediment is removed.
- Drainage structures causing significant damage to either the road or private property are taken care of ASAP.
- Structures that have been problematic either during the winter or the spring are scheduled for cleaning and repair on an as needed basis during the summer months (See Problem Site Maintenance Plan)
- Pequannock Township maintains a capital program for de-silting and de-snagging all major open channel conveyance systems.

Work Plan

- Locate underground utilities before starting work.
- Place signs, traffic warning devices and necessary
- Provide appropriate traffic control where necessary and all other required safety equipment. Insure personnel are properly trained on the use of equipment and safety procedures.

Work Plan (Cont.)

- Remove trash or debris from ditch. Dispose of at the DPW yard.
- Remove sediment and debris in and around the ditch.
- If signs of channeling, erosion, or flooding are present indicating sediment transfer through the swale, record and transfer to the DPW Supervisor for prioritization and scheduling for repairs.
- Record and/or photograph condition.
- Stormwater Coordinator will consider adding energy dissipation rock, check dams, or stabilizing vegetation to minimize erosion.
- Excavate the ditch to the correct grade and cross-section; load waste material into dump trucks. *Verify with Stormwater Coordinator that all required permits are obtained.*
- Haul the waste for disposal area.
- Clean up work area. Sweep roadway and/or shoulder as necessary.
- Hydro seed banks for erosion control.
- Maintenance is performed based on inspection results.

Outfall Maintenance

Outfalls are the discharge points where storm water enters the receiving body of water at the end of a storm water conveyance system.

Inspections

- Each outfall is inspected once every year.
- Check for litter, rubbish, and debris around the outfall area.
- The outfall is inspected to ensure flow conveyance and functionality. The outfall site is inspected for signs of:
  - Sediment accumulation and localized erosion,
  - Exposed soil material with no vegetative cover,
- Evidence of illicit discharges should be checked and may include the following items:
  - Odor
  - Color
  - Clarity
  - Floatables
  - Deposits/stains
  - Vegetation condition
  - Structural condition
  - Biology

Maintenance Procedures

- Sediment and debris in and around the outfall is removed.
- If repairs are required, the condition is reported and prioritized for completion with other maintenance activities.
- The NJDEP should be contacted if any illicit discharges are suspected as noted during inspection.
- Maintenance needs are performed on an as needed basis.