MS4 Stormwater Management Control Program

pennsylvania
DEPARTMENT OF TRANSPORTATION

1

2

What is MS4?

Municipal **S**eparate **S**torm **S**ewer **S**ystem
Regulatory Requirement – 40 CFR 122.34(b)(6)

- The goal is to prevent or reduce pollutant runoff from maintenance and construction operations that discharge storm water to surface waters of the United States.

PennDOT must:

- Implement Stormwater Management Program as described in the permit
- Design to reduce discharge of pollutants
- Make level of effort "maximum extent practicable"

pennsylvania
DEPARTMENT OF TRANSPORTATION

2

MS4 PCSM

What do designers need to think about when looking at post construction stormwater management?

- Design SCMs based off permit guidelines.
- Consider level of effort regarding maintenance of the facility.
- Clearly define and identify discharge points.
- Install signs identifying the SCMs
- Reminder that the contractor is responsible for having a licensed professional or designee on site during the installation of all BMPs as per Pub 408, Section 107.28.

pennsylvania
DEPARTMENT OF TRANSPORTATION

3

PCSM Plan Notes

BMP – LONG TERM INSPECTION, MAINTENANCE AND REPAIR (IMR) SCHEDULE

BMP	INSPECTION	MAINTENANCE	REPAIR
ROCK APRON, ROCK CHANNEL, AND ROCK ENERGY DISSIPATOR OUTLET PROTECTION	TWICE YEARLY AND WITHIN 48 HOURS AFTER EVERY MAJOR STORM EVENT (>1 INCH RAINFALL DEPTH).	ANY SEDIMENT OR DEBRIS ACCUMULATED WITHIN THE ROCK SHALL BE REMOVED.	DISPLACED RIPRAP WITHIN THE APRON SHALL BE REPLACED WITHIN 10 WORKING DAYS.
ROLLED EROSION CONTROL PRODUCT	WEEKLY AND AFTER EACH RAINOFF EVENT UNTIL PERENNIAL VEGETATION IS ESTABLISHED.	DAMAGED OR DISPLACED BLANKETS SHALL BE RESTORED OR REPLACED WITHIN 4 DAYS.	AREAS THAT ARE ERODED OR WHERE THE MATTING HAS BEEN DISPLACED WILL BE REGRADED, SEEDED, AND AMENDED IN ACCORDANCE WITH THE RATES INDICATED ON THE PLAN DRAWINGS PRIOR TO REPLACEMENT OF THE EROSION CONTROL MATTING.
VEGETATED SWALE	ANNUALLY AND WITHIN 48 HOURS AFTER EVERY MAJOR STORM EVENT (>1 INCH RAINFALL DEPTH).	SWALE DIMENSIONS SHALL BE CONSTANTLY MAINTAINED. CLEAN SWALE WHENEVER THE TOTAL SWALE DEPTH IS REDUCED BY 25%. SEDIMENT DEPOSITS SHALL BE REMOVED WITHIN 24 HOURS OF DISCOVERY.	DAMAGED LINING SHALL BE REPAIRED OR REPLACED WITHIN 10 WORKING DAYS.
INFILTRATION TRENCH	ANNUALLY AND WITHIN 48 HOURS AFTER EVERY MAJOR STORM EVENT (>1 INCH RAINFALL DEPTH).	VEGETATION ALONG THE SURFACE OF THE TRENCH SHALL BE MAINTAINED IN GOOD CONDITION AND ANY BARE SPOTS REVEGETATED AS SOON AS POSSIBLE. AVOID EXCESSIVE COMPACTION BY MOWERS.	REVEGETATE SURFACE AND REMOVE SEDIMENT BUILDUP AS NEEDED.

LONG TERM OPERATION AND MAINTENANCE SCHEDULE

AFTER THE PCSW BMPS ARE ACCEPTED, THE OWNER SHALL COMMENCE INSPECTIONS OF THE PERMANENT FACILITIES BASED ON PUB. 888. THE OWNER IS PERMITTED TO MAKE REPAIRS TO PCSW BMP'S THAT REQUIRE MAINTENANCE WITHIN 10 WORKING DAYS.

ALL VEGETATION, TRASH, DEBRIS, LIQUIDS, AND MATERIALS REMOVED FROM THE (STORMWATER CONTROL MEASURE) SCM SHALL BE DISPOSED OF IN ACCORDANCE WITH THE DEPARTMENT'S WASTE MANAGEMENT POLICY AND ALL APPLICABLE REGULATIONS. SEDIMENT SHALL BE DISPOSED OF IN ACCORDANCE WITH THE DEPARTMENT'S POLICY ON HANDLING OF FILL AND APPLICABLE REGULATIONS. SEE SECTION 4.5 OF PUB. 888 FOR MORE DETAILS.

DO NOT ENTER MANHOLES, INLETS, OR ANY STRUCTURE MEETING OSHA STANDARDS FOR CONFINED SPACE WITHOUT CURRENT CONFINED SPACE TRAINING AND APPROPRIATE SAFETY MEASURES IN PLACE. DO NOT ATTEMPT TO PERFORM MAINTENANCE ACTIVITIES WHILE WATER IS STANDING IN OR FLOWING THROUGH THE SYSTEM WITHOUT PROPER TRAINING AND SAFETY MEASURES IN PLACE.

FREQUENCY	ACTIVITY
TWO TIMES PER YEAR	MOW GRASS, IF PRESENT IN AN SIT WITH VEGETATED SURFACE TO A HEIGHT OF 5-8 INCHES. PERFORM BANK MOWING OPERATIONS WHEN SCW IS COMPLETELY DRY, PREFERABLY USING HAND
ANNUALLY	REMOVE SEDIMENT, LITTER, TRASH, AND DEBRIS FROM SCW SURFACE, SIDE SLOPES, INFLOW AND
AS NEEDED	MAINTAIN APPLICABLE COMMON COMPONENTS AS DESCRIBED IN CHAPTER 6 OF PUB. 888 AT THE INDICATED

4

Design Considerations

Maintainability

- Access
  - Do we need a fence?
  - Can equipment enter?
- Specialized equipment
  - Low Ground Pressure mowers
  - Vacuum truck

pennsylvania DEPARTMENT OF TRANSPORTATION

5

Design Considerations

- Future Inspection Criteria
  - Cycle/Schedule
  - Access
    - Confined space training
- Right of Way Impacts
  - Long linear take vs. wide area for a basin
  - Access if not located directly adjacent to roadway

pennsylvania DEPARTMENT OF TRANSPORTATION

6

Difficult to Maintain SCMs

Bioretention

Subsurface Detention Storage

pennsylvania
DEPARTMENT OF TRANSPORTATION

7

Bioretention

Location

- Urban and suburban settings
- Median strips
- Parking lot islands
- Short segments adjacent to swales

pennsylvania
DEPARTMENT OF TRANSPORTATION

8

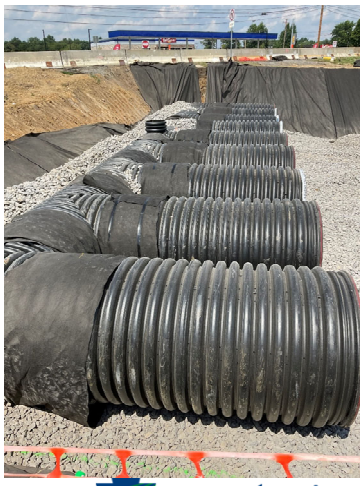
Bioretention Basin (BRE)

ECMS 24523 Moraine State Park Int.

pennsylvania DEPARTMENT OF TRANSPORTATION

9

Subsurface Detention Storage (SDS)



ECMS 91286 Three Degree Road Intersection

pennsylvania DEPARTMENT OF TRANSPORTATION

10

Subsurface Detention Storage (SDS)

pennsylvania
DEPARTMENT OF TRANSPORTATION

11

Subsurface Detention Storage (SDS)

pennsylvania
DEPARTMENT OF TRANSPORTATION

12

Subsurface Detention Storage (SDS)

pennsylvania
DEPARTMENT OF TRANSPORTATION

13

District SCM Preferences

Vegetated Filter Strip and Infiltration Berm
- Easiest to maintain

Vegetated Swale and Subsurface Infiltration Trench
- Next easiest to maintain

Basins
- Dry, Wet, and Infiltration

pennsylvania
DEPARTMENT OF TRANSPORTATION

14

Vegetated Filter Strip (VFS)

ECMS 92622 Fenstermaker Railroad Bridge

pennsylvania DEPARTMENT OF TRANSPORTATION

15

Infiltration Berm (IBE)

ECMS 86840 East Sligo Bridge

pennsylvania DEPARTMENT OF TRANSPORTATION

16

Vegetated Swale (VSW)

ECMS 77919 Cessna Run Bridge

pennsylvania
DEPARTMENT OF TRANSPORTATION

17

Vegetated Swale with Check Dams (VSC)

ECMS 91249 Kittanning Elementary Int.

pennsylvania
DEPARTMENT OF TRANSPORTATION

18

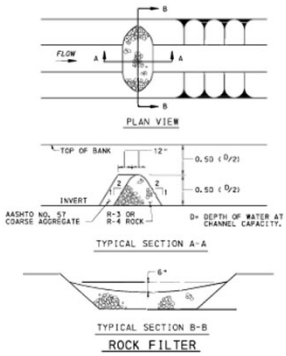
Vegetated Swale with Check Dams (VSC)

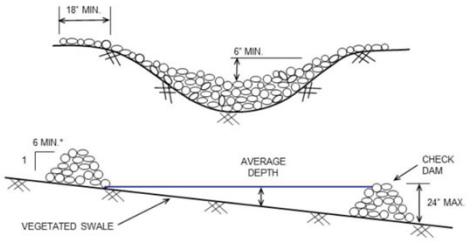
ECMS 92622 Fenstermaker Railroad Bridge

pennsylvania
DEPARTMENT OF TRANSPORTATION

19

Vegetated Swale with Check Dams (VSC)





pennsylvania
DEPARTMENT OF TRANSPORTATION

20

Vegetated Swale with Check Dams (VSC)

pennsylvania
DEPARTMENT OF TRANSPORTATION

21

Subsurface Infiltration Trench (SIT)

ECMS 77919 Cessna Run Bridge Project

- Rate and Volume Control
- Flexible design suited well for confined space
- Can be combined with other SCMs

pennsylvania
DEPARTMENT OF TRANSPORTATION

22

Dry Detention Basin (BDD)

ECMS 85575 Theater Road Intersection

pennsylvania DEPARTMENT OF TRANSPORTATION

23

Dry Extended Detention Basin (BED)

ECMS 24505 Seneca Missing Ramps

pennsylvania DEPARTMENT OF TRANSPORTATION

24

Wet Detention Basin (BWD)

ECMS 78016 Mars Railroad Bridge

pennsylvania DEPARTMENT OF TRANSPORTATION

25

Wet Detention Basin (BWD)

ECMS 24853 SR 79-228 Ramps

pennsylvania DEPARTMENT OF TRANSPORTATION

26

Infiltration Basin (BID)

ECMS 26007 SR 119-410 Intersection

pennsylvania DEPARTMENT OF TRANSPORTATION

27

Permit Tips

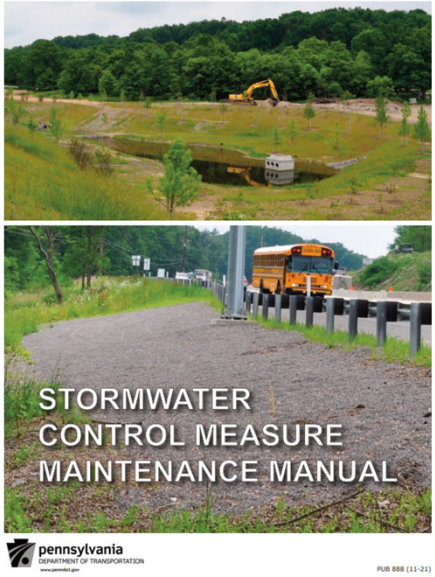
Items to avoid when obtaining permits

- 70% growth on rock slopes results in issues to get an NOT with an NPDES permit.
  - Provide topsoil of slopes 2:1 or greater.
    - Consider using Slope Enhancement Mix
      - PUB 408, Section 804
      - Additive to formula C with hydroseed application

pennsylvania DEPARTMENT OF TRANSPORTATION

28

Publication 888



pennsylvania
DEPARTMENT OF TRANSPORTATION

29

QUESTIONS?

pennsylvania
DEPARTMENT OF TRANSPORTATION

30