Construction Site Stormwater Best Management Practices

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Presentation Overview

Best Management Practices (BMPs)

- Uses/Purposes/Considerations
 - -Flow interception/redirection
 - -Pollution prevention
 - -Erosion prevention and sediment management
 - -Active treatment
- Role of the Municipal Inspector with BMPs
- Update to the Hierarchy of BMPs
- Six categories of BMPs



Prevent pollutants from leaving the site

- Sediment
- Concrete washout
- Paint
- Oil and grease
- Litter
- Waste
- Construction materials
- By preventing
 - Contact with stormwater runoff
 - Mobilization of pollutants
 - Illicit discharge



Source: Michigan DEQ



Best Management Practices: Role of the Inspector

- Inspectors don't select BMPs for private developers to use – they determine compliance
- Ask questions
- Know appropriate use
- Recognize proper installation
- Observe if maintenance is needed
- Note if additional controls are needed



- Typical order of six BMP categories:
 - Erosion Control
 - Sediment Control
 - Good Site Management
 - Non-Stormwater Management
 - Run-on and Run-off Control
 - Active Treatment Systems (ATS)



Overall goal: reduce pollutants and control run-off

- 1. Control run-on from other sites
- Reduce sources of pollutants on-site (Good Site Management and Non-Stormwater management)
- 3. Control erosion
- 4. Control sediment
- 5. Active Treatment Systems, if needed



Revised Order of Six BMP categories:

- Run-on and Run-off Control
- Good Site Management
- Non-Stormwater Management
- Erosion Control
- Sediment Control
- Active Treatment Systems (ATS)



Run-on and Runoff BMPs

Run-on Controls

- Keep water from off-site, upstream property from flowing through construction site
 - -May bring off-site pollutants
 - -May increase stormwater runoff flows
 - causing erosion or
 - overwhelming BMPs

| 11. | Run-on and Runoff Control | |
|-----|------------------------------------|--|
| | Earth Dikes / Drainage Swales | |
| | Sampling is conducted, if required | |
| | | |



- a.k.a. Good housekeeping
- Materials that have potential to be pollutants in stormwater
 - Material storage/use
 - Waste storage
 - Stockpiles
 - Porta potties
 - Waste disposal





| 13. | Goo | od Site Management | |
|-----|-----|--------------------------------------|--|
| | | Soil Stockpiles | |
| | | Waste Systems Management | |
| | | ConstructionMaterials (wood,cement,) | |
| | | Hazardous Materials (paint,solvents) | |
| | | Petroleum Products (oil, fuel) | |
| | | Vehicle Servicing | |



Keep stormwater from coming into contact with materials that can mobilize

- Keep materials from being exposed
- Keep materials from leaking
- Keep potential discharges from leaving the site (e.g., placement)
- Safety and disposal issues





Check for:

- Covered and contained stockpiles
- Covered and elevated material storage
- Placement of portable toilets and secondary containment





Stockpiles

- Cover when not being used
- Protect all year long
- Placement (e.g., not in gutter)
- Berm around stockpile or upstream side





Non-Stormwater Management

- Activities that have potential to discharge pollutants:
 - Potable water use
 - Paving/grinding operations
 - Vehicle/equipment use, cleaning, fueling and maintenance
 - Concrete work
 - Waste and recycling disposal





Non-Stormwater Management BMPs

| 14. | Non-Stormwater Management | |
|-----|---------------------------------|--|
| | Concrete/Stucco washout area | |
| | Architectural copper rinsewater | |
| | Other: | |



Non-Stormwater Management

Concrete Washout

- Large enough for volume expected
- Lined prevent contact with or leaching into soils
- pH issue
- Dispose of hardened concrete













Non-Stormwater Management





- Place drip pans, tarp, or containers under leaky vehicles/ equipment
- Fix leaks promptly
- Fuel, repair and wash equipment/vehicles off site



Erosion & Sediment Control

Erosion control

- First line of defense
- Prevent soil movement/suspension by wind or water

Sediment control

- Second line of defense
- Capture soil before it leaves the site

Temporary or Permanent Controls

Remove temporary BMPs at completion



Inspection Finding

9. Erosion Control Measures:

(A / NM / P / NA)*

| Jute Netting/Fiber Blankets | |
|---------------------------------------|--|
| Mulch | |
| Hydroseed/Soil binder/Compost blanket | |
| Mark Areas to be Preserved | |
| Tree Protection Fencing | |
| Riparian Area Barrier | |



Most effective BMP - Vegetation

- Shields soil from impact of wind & water
- Increases permeability/infiltration
- Slows run-off to non-erosive velocities
- Filters sediment out of run-off
- Preserve existing vegetation
- Apply seed, compost & mulch as soon as possible (final cover)



Sites should consider

- Equipment needed
- Product flexibility (condition of slope)
- Used to establish vegetation
- Installation timing (e.g., sprays need time to dry before rain)
- Length of time
- Irrigation availability
- End use of site for vegetation or building? Compost-based BMPs can be used to enhance soil



Temporary protection of exposed soil

- Sprays such as straw or bonded fiber matrix (BFM)
- Mats such as jute, coir or other fiber
- Compost blankets



Sediment Control

Trap sediment before it leaves the site

- Intercept flow
- Perimeter controls
 - -site perimeter
 - -storm drains
- Filter sediment out of flow
- Slow flow to allow sediment to settle out



Sediment Control BMPs

| 10. | Sec | iment Control Measures | |
|-----|-----|---------------------------------------|--|
| | | Stabilized construction entrance | |
| | | Street Sweeping | |
| | | Dust Control | |
| | | Wattles / Fiber Rolls / Compost Socks | |
| | | Silt Fences / Compost Berms | |
| | | Sedimentation Basin | |
| | | Check Dams | |
| | | Inlet Filters (Gravel bags) | |
| | | Earth Dikes / Drainage Swales | |







Sediment Control BMPs

Silt Fence

- Perimeter control
- Sheet flow
- Not for concentrated flow
- Continuous contact with ground
- No daylight underneath trenched in
- Ends overlap

Prevention Program

- Remove accumulated sediment
- Stake positioned opposite of flow



Silt Fence

Correctly installed, but accumulated sediment should be removed





Incorrectly installed





Likely a problem with concentrated flow





Sediment Control BMPs

Inlet protection should not:

- cause flooding (where does overflow go?)
- cause sediment discharge (i.e., broken sand bags or gravel bags)
- Inlet protection should be:
 - maintained regularly
 - removed at end of job
- Inlet protection may be off site



Construction Site Entrance/Exit

Stabilized Construction Entrance/Exit - look for:

- Sediment in gravel/rumble plates or in wash racks basin
- Signs of other exits or entrances
- Track out in streets (combine with street sweeper BMP)
- Minimum 50 ft. length x 30 ft. width. (Formerly length = 12 x largest wheel diameter.) Best if long enough to accommodate the whole vehicle (with all the wheels) of the largest trucks servicing the site
- See CASQA fact sheet TC-1 for more details on design















Rumble plates oriented incorrectly

WHAT'S INSIDE?

- E: weed-free rice straw : weed seed free rice straw XX : 2" minus compost ER TUBES: excelsior & rock ER BAGS : excelsior & rock IBES : wood- and man-made fibers AGS : 34" rock : bio-matrix (peat moss)
- R: trifluralin

Water Pollution Prevention Program





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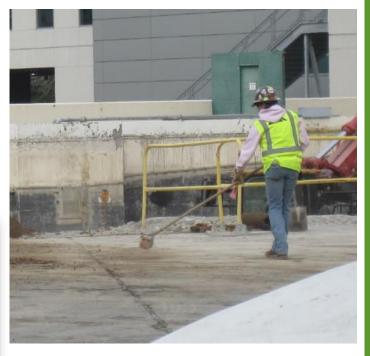


Construction Site Entrance

Additional BMPs may be needed

- Street sweeping
- Wheel wash





Sediment Control

Active Treatment

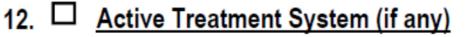
Active Treatment Systems

- Adds chemicals for coagulation, flocculation and/or filtration
- Not common expensive
- State General Permit requires
 - -ATS Plan: O&M manual, monitoring, sampling, spill prevention plan,
 - -Designated operator and training
 - -Data recording system
 - -Numeric effluent limits for discharge









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