

Inspecting Construction Site BMPs

Kristin Kerr
EOA, Inc.

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Outline of Presentation

- Back to Basics
- Erosion and Sediment Control
- Good Site Management
- Non-Stormwater Management
- Run-on and Run-off Control



Back to Basics

- Prevent pollutants from leaving the site
 - **SEDIMENT**
 - Concrete washout
 - Paint
 - Oil and grease
 - Litter
 - Waste
 - Construction materials, etc.
- By preventing
 - Contact with stormwater runoff
 - Mobilization of pollutants
 - Illicit discharge



Inspector

- Do not need to select BMPs to use at site
- Need to know
 - Proper installation
 - When and where BMPs are appropriate
 - Determine effectiveness
 - Maintenance or repair needed

Refer to CASQA Construction Handbook BMP Fact Sheets



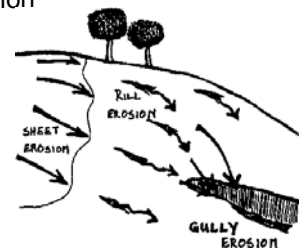
Erosion Control

- BMPs to keep sediment in-place
- Sediment mobilized by
 - Wind
 - Rain drops
 - Stormwater flow



Erosion Control

- Categories of erosion
 - Sheet erosion
 - Rill erosion
 - Gully erosion
 - Channel erosion




Source: Photo from DuPont Gardens, Courtesy of New Zealand Digital Library





Erosion Control

Sheet Erosion

- Description
 - Removal of broad thin layer of soil
 - Greatest overall soil loss
- Prevention
 - Cover
 - Soil binders




Source: Michigan DEQ


Erosion Control

Rill Erosion

- Description
 - Runoff concentrates in a given area
 - Water scours a path through soil
- Prevention
 - Cover/Binders
 - Segment slope




Source: Santa Clara County






Erosion Control

Gully Erosion

- Description
 - Deeper than rill erosion
 - Removes large amount of soil in a concentrated area
- Prevention
 - Control Flow




Source: Santa Clara County






Erosion Control

Channel Erosion


- Description
 - Increased velocity/volume of flow causes erosion in onsite channel, stream, etc.
- Prevention
 - Control Flow





Sediment Control



- Prevent transport of sediment off site - sediment mobilized from erosion
 - Perimeter control
 - Storm drain protection
 - Entrance/Exit controls
 - Water bodies on-site





Erosion & Sediment Control



- Erosion control
 - First line of defense
 - Prevent soil movement by wind and water
- Sediment control
 - Second line of defense
 - Remove soil before it leaves the site
- Temporary or Permanent Controls
- Remove temporary BMPs at completion

Erosion Control BMPs

EC-1	Scheduling	EC-11	Slope Drains
EC-2	Preservation of Existing Vegetation	EC-12	Streambank Stabilization
EC-3	Hydraulic Mulch	EC-14	Compost Blankets
EC-4	Hydroseeding	EC-15	Soil Preparation/Roughening
EC-5	Soil Binders	EC-16	Non-Vegetative Stabilization
EC-6	Straw Mulch		
EC-7	Geotextiles & Mats		
EC-8	Wood Mulching		
EC-9	Earth Dikes and Drainage Swales	WE-1	Wind Erosion Control
EC-10	Velocity Dissipation Devices		

- ## Erosion Control BMPs
- 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
 - Seed & mulch as soon as possible (final cover)
- 




Erosion Control BMPs

- Temporary protection of exposed soil
 - Mats
 - Sprays (straw, bonded fiber matrix)









- ## Erosion Control BMPs
- Site selects BMPs and may consider
 - Equipment needed
 - Product flexibility (condition of slope)
 - Length of time
 - Used to establish vegetation
 - Inspector needs to know if it's working
 - Ask questions
 - What to look for
- 


Erosion Control BMPs

Source: San Diego County



Link: <https://www.youtube.com/watch?v=Kdm-Z-AGnU>
 Start time: 0:00; End time: 4:48

Jute Mat Installation


Source: All Stake Supply


<https://www.youtube.com/watch?v=cFgL60LVJNc>

Erosion Control


- What to look for
 - Anchors or Adhesives
 - Visible soil
 - Soil preparation
 - Roughened
 - Groomed (e.g. large rocks/boulders removed)
 - Stretching (e.g. Jute matting will conform if not stretched)





Sediment Control BMPs


SE-1	Silt Fence	SE-12	Temporary Silt Dike
SE-2	Sediment Basin	SE-13	Compost Socks and Berms
SE-3	Sediment Trap	SE-14	Biofilter Bags
SE-4	Check Dam		
SE-5	Fiber Rolls		
SE-6	Gravel Bag Berm		
SE-7	Street Sweeping and Vacuuming	TC-1	Stabilized Construction Entrance/Exit
SE-8	Sandbag Barrier	TC-2	Stabilized Construction Roadway
SE-9	Straw Bale Barrier	TC-3	Entrance/Outlet Tire Wash
SE-10	Storm Drain Inlet Protection		



Fiber Rolls


Source: San Diego County


Link: <https://www.youtube.com/watch?v=X1x9ver8zbc>
 Start time: 0:26; End time: 7:10



Fiber Rolls

- Contact with ground
 - Staked in
 - Trenched on slope
- Overlap
- Turn ends up slope (height of roll to capture runoff)
- Not for high traffic areas






Silt Fence

Source: Ohio EPA

Link: https://www.youtube.com/watch?v=w_hsjUNBYNM&list=PLb5RskTHW_baFkz98QQBKAwUZ5KdcNCMB
 Start time: 1:39; End time: 2:42



Silt Fence Installation

Source: All Stake Supply

Link: https://www.youtube.com/watch?v=u2PeLrxY-_A



Silt Fence

- Perimeter control
- Sheet flow
 - Not for concentrated flow
- Continuous contact with ground
 - No daylight underneath
- Ends overlap
- Remove accumulated sediment



Inlet Protection

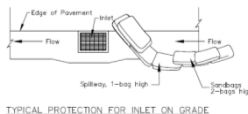
Source: San Diego County

Link: <https://www.youtube.com/watch?v=zX9q85P2Fkk>
Start time: 0:54; End time: 6:51



Inlet Protection

- Gravel bags
 - Located around inlet based on direction of flow



Inlet Protection

Source: Michigan DEQ

Link: <https://www.youtube.com/watch?v=B9Cx3NUkSrY&feature=youtu.be>
Start time: 27:10.8; End time: 28:53



Inlet Protection

- Inlet protection should not:
 - cause flooding
 - cause sediment discharge (i.e. broken sand bags/gravel bags)
- Inlet protection should be:
 - maintained regularly
 - removed at end of job
- Inlet protection may be off site



Construction Site Entrance

Source: Ohio EPA

Link: https://www.youtube.com/watch?v=6wmgVhc_gr4
Start time: 0:48; End time: 2:18.8



Construction Site Entrance

Source: San Diego County

Link: <https://www.youtube.com/watch?v=UxOam2GEVqQ>
 Start time: 6:09.6; End time: 7:02



Construction Exits

- Entrance/Exit Stabilization
 - Sediment in gravel/rumble plates
 - Signs of other exits
 - Track out in streets
- Additional BMPs
 - Street sweeping
 - Wheel wash



Good Site Management = Housekeeping

- Materials that have potential to be pollutants in stormwater
 - Material storage/use
 - Waste storage
 - Stockpiles
 - Porta potties
 - Waste disposal



Good Site Management

- 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)



Good Site Management BMPs

WM-1	Material Delivery and Storage	WM-6	Hazardous Waste Management
WM-2	Material Use	WM-7	Contaminated Soil Management
WM-3	Stockpile Management	WM-8	Concrete Waste Management
WM-4	Spill Prevention and Control	WM-9	Sanitary/Septic Waste Management
WM-5	Solid Waste Management	WM-10	Liquid Waste Management



Good Site Management

Source: San Diego County

Link: <https://www.youtube.com/watch?v=UxOam2GEVqQ>
 Start time: 9:41.042; End time: 10:15.9



Good Site Management

Source: Ohio EPA

Link:

https://www.youtube.com/watch?v=w_hsjUNBYNM&list=PLb5RskTHW_baFkz98QQBKAwUZ5KdNCMB

Start time: 8:46; End time: 10:02



Good Site Management

- Check for
 - Designated concrete washout areas
 - Covered and contained stockpiles
 - Covered and elevated material storage
 - Placement &/or 2" containment for portable toilets



Non-Stormwater Management

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



Non-Stormwater Management BMPs

NS-1	Water Conservation Practices	NS-9	Vehicle and Equipment Fueling
NS-2	Dewatering Operations	NS-10	Vehicle and Equipment Maintenance
NS-3	Paving and Grinding Operations	NS-11	Pile Driving Operations
NS-4	Temporary Stream Crossing	NS-12	Concrete Curing
NS-5	Clear Water Diversion	NS-13	Concrete Finishing
NS-6	Illicit Connection/Discharge	NS-14	Material and Equipment Use
NS-7	Potable Water/Irrigation	NS-15	Demolition Adjacent to Water
NS-8	Vehicle and Equipment Cleaning	NS-16	Temporary Batch Plants



Non-Stormwater Management



Other BMP Categories

- 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
- Runoff Controls
 - Manage stormwater flow to prevent erosion or flooding at downstream location



Other BMP Categories

- Active Treatment Systems
 - Are there any in the area?
 - Adds chemicals for coagulation, flocculation and/or filtration
- 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



Construction BMP Success!

Link: <https://www.youtube.com/watch?v=JAOvZ4zG1A0>



QUESTIONS?



Videos Courtesy of

San Diego County
Department of Public Works
Watershed Protection Program



Michigan Department of
Environmental Quality



Ohio EPA



Contact Information

Peter Schultze-Allen
pschultze-allen@eoainc.com
510.832.2852, x128

Kristin Kerr
kakerr@eoainc.com
510.832.2852, X122

