Inspecting Construction Site BMPs

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Construction Inspection Workshop
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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: Food from Dryland 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

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<th>Scheduling</th>
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<td>WE-1</td>
<td>Wind Erosion Control</td>
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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

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<td>Sediment Trap</td>
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<td>Fiber Rolls</td>
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<td>TC-1</td>
<td>Stabilized Construction Entrance/Exit</td>
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<td>Stabilized Construction Roadway</td>
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<td>TC-3</td>
<td>Entrance/Outlet Tire Wash</td>
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</table>
Fiber Rolls

Source: San Diego County

Link: https://www.youtube.com/watch?v=X1x9ver8zbo
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=zX9g85P2Fkk
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=UxOam2GEVgQ
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

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<td>WM-10</td>
<td>Liquid Waste Management</td>
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Good Site Management

Source: San Diego County

Link: https://www.youtube.com/watch?v=UxOam2GEVgQ
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_baFkz98QQBKAwUZ5KdcNCMB
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
<table>
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<th>Water Conservation Practices</th>
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<th>Vehicle and Equipment Fueling</th>
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<td>Temporary Batch Plants</td>
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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
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