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
**Erosion Control**

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

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

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

**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-2 Preservation of Existing Vegetation
- EC-3 Hydraulic Mulch
- EC-4 Hydroseeding
- EC-5 Soil Binders
- EC-6 Straw Mulch
- EC-7 Geotextiles & Mats
- EC-8 Wood Mulching
- EC-9 Earth Dikes and Drainage Swales
- EC-10 Velocity Dissipation Devices
- EC-11 Slope Drains
- EC-12 Streambank Stabilization
- EC-13 Compost Blankets
- EC-14 Soil Preparation/Roughening
- EC-15 Non-vegetative Stabilization
- EC-16 Wind Erosion Control

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)

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**

**Jute Mat Installation**

Link: [https://www.youtube.com/watch?v=Kdm-Zm-AO9U](https://www.youtube.com/watch?v=Kdm-Zm-AO9U)
Start time: 0:00; End time: 4:48

Link: [https://www.youtube.com/watch?v=cFgL60LVJNc](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-2 Sediment Basin
- SE-3 Sediment Trap
- SE-4 Check Dam
- SE-5 Fiber Rolls
- SE-6 Gravel Bag Berm
- SE-7 Street Sweeping and Vacuuming
- SE-8 Sandbag Barrier
- SE-9 Straw Bale Barrier
- SE-10 Storm Drain Inlet Protection
- SE-12 Temporary Silt Dike
- SE-13 Compost Socks and Berms
- SE-14 Biofilter Bags

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

- Link: https://www.youtube.com/watch?v=6rj9oFL6aRw
  Start time: 1:39; End time: 2:42

Silt Fence Installation

- Link: https://www.youtube.com/watch?v=2PeLxY_Y_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

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

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

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Construction Site Entrance
Source: San Diego County

Link: https://www.youtube.com/watch?v=UxOam2GEvQ
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

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

Good Site Management
Source: San Diego County

Link: https://www.youtube.com/watch?v=UxOam2GEvQ
Start time: 9:41.042; End time: 10:15.9
Good Site Management

Link: https://www.youtube.com/watch?v=w_hsjUNBYNM&list=PLb5RskTHW_bafkz8RQGBKxUZ5K3dNCMB
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

<table>
<thead>
<tr>
<th>NS-1</th>
<th>Water Conservation Practices</th>
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<tbody>
<tr>
<td>NS-2</td>
<td>Dewatering Operations</td>
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<td>NS-3</td>
<td>Paving and Grinding Operations</td>
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<td>NS-4</td>
<td>Temporary Stream Crossing</td>
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<td>NS-5</td>
<td>Clear Water Diversion</td>
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<td>Illicit Connection/Discharge</td>
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<td>Potable Water/Irrigation</td>
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<td>NS-8</td>
<td>Vehicle and Equipment Cleaning</td>
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<td>Vehicle and Equipment Fueling</td>
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<td>NS-10</td>
<td>Vehicle and Equipment Maintenance</td>
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<td>NS-11</td>
<td>Pile Driving Operations</td>
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<td>NS-12</td>
<td>Concrete Curing</td>
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<td>NS-13</td>
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<td>NS-14</td>
<td>Material and Equipment Use</td>
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<td>NS-15</td>
<td>Demolition Adjacent to Water</td>
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<tr>
<td>NS-16</td>
<td>Temporary Batch Plants</td>
</tr>
</tbody>
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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
    - 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=JAOvZ4xG1A0

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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