Municipal Construction Stormwater Site Inspection Toolkit Training

Rebecca Dugopolski, PE
George Iftner, CPESC
Introductions
Instructors

REBECCA DUGOPOLSKI, PE
Associate Engineer
Key project experience:
• Stormwater monitoring, planning, design, and O&M
• NPDES Permit compliance
• Training: IDDE, O&M, and LID

GEORGE IFTNER, CPESC
Senior Scientist
Key project experience:
• Stormwater planning, monitoring, and NPDES Permit compliance
• Construction inspections
• Training: IDDE, O&M
Introductions
Participants

1. What is your name?

2. Who do you work for?

3. What is your job role?
   - Construction stormwater site inspector
   - Manager/overseer of inspectors
   - Stormwater site plan reviewer
   - NPDES permit coordinator
   - Building inspector
   - Other

4. Do you have a CESCL or CPESC certification?
Agenda

- Training logistics and objectives
- Project overview
- Permit requirements
- Pre-construction plan review
- ESC checklists
- Permanent BMP checklists
- Electronic checklist implementation
- Wrap up and evaluation
Agenda

- Training logistics and objectives
- Project overview
- Permit requirements
- Pre-construction plan review
- ESC checklists
- Permanent BMP checklists
- Electronic checklist implementation
- Wrap up and evaluation
Training Logistics

- 4-hour training with one break
- Restroom location
- Refreshments
- Turn off cell phones
- Sign-in sheet
- Training evaluation (at end)
Training Objectives

- Introduce the municipal construction stormwater inspection toolkit

- Highlight critical items for:
  - Municipal stormwater site plan reviewers
  - Municipal erosion and sediment control (ESC) inspectors
  - Municipal engineers
Agenda

• Training logistics and objectives
• **Project overview**
• Permit requirements
• Pre-construction plan review
• ESC checklists
• Permanent BMP checklists
• Electronic checklist implementation
• Wrap up and evaluation
Project Overview
Funding and Proposed Deliverables

Grant of Regional or Statewide Significance (GROSS) from Ecology

- Develop 3 checklists:
  - Pre-construction
  - During construction
  - Post-construction
- Two working group meetings (StormTAC)
- Two factsheets (Western and Eastern WA)
- Six trainings (Western WA)
Project Overview
Funding and Proposed Deliverables

3 checklists -> 5 checklists

- ESC inspection
  - Initial ESC
  - Construction ESC
  - Post-Construction ESC

- Permanent Stormwater BMP/Facility inspection
  - Construction
  - Post-Construction
**Project Overview**

**Project Timeline**

- **February 2018**
  - Project Kickoff Meeting

- **March 2018**
  - Survey and memo

- **May 2018**
  - Draft checklists

- **June 2018**
  - Revised draft checklists

- **October 2018**
  - Final checklists

- **May 2018**
  - StormTAC Working Group Meeting #1

- **July 2018**
  - StormTAC Working Group Meeting #2

- **November 2018 – February 2019**
  - Trainings (total of 6)
Agenda

- Training logistics and objectives
- Project overview
- Permit requirements
- Pre-construction plan review
- ESC checklists
- Permanent BMP checklists
- Electronic checklist implementation
- Wrap up and evaluation
Permit Requirements
NPDES Municipal Stormwater Permit (Phase I and Western WA Phase II)

- **Pre-construction inspections** should be conducted prior to clearing and construction on sites that have a high potential for sediment transport.

- **Construction inspections** should verify proper installation and maintenance of required erosion and sediment controls.

- **Post-construction inspections** should verify proper installation of permanent stormwater BMPs.
Permit Requirements
NPDES Municipal Stormwater Permit (Phase I and Western WA Phase II)

- Minimum Requirement #2 (MR #2):
  - 13 elements required by the Municipal Stormwater Permit and the Construction Stormwater General Permit
  - Element #13 is Protecting Low Impact Development BMPs
# Permit Requirements
NPDES Municipal Stormwater Permit (Phase I and Western WA Phase II)

<table>
<thead>
<tr>
<th>#1 Preserve Vegetation / Mark Clearing Limits</th>
<th>#2 Establish Construction Access</th>
<th>#3 Control Flow Rates</th>
<th>#4 Install Sediment Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>#5 Stabilize Soils</td>
<td>#6 Protect Slopes</td>
<td>#7 Protect Drain Inlets</td>
<td>#8 Stabilize Channels &amp; Outlets</td>
</tr>
<tr>
<td>#9 Control Pollutants</td>
<td>#10 Control De-Watering</td>
<td>#11 Maintain BMPs</td>
<td>#12 Manage the Project</td>
</tr>
<tr>
<td>#13 Protect Low Impact Development BMPs</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Agenda

- Training logistics and objectives
- Project overview
- Permit requirements
- Pre-construction plan review
- ESC checklists
- Permanent BMP checklists
- Electronic checklist implementation
- Wrap up and evaluation
Pre-Construction Stormwater Site Plan Reviews
What should a reviewer be looking for?

Site Map

- Boundaries and identification of different soil types
- Areas of potential erosion problems
- Areas of soil disturbance (clearing, grading, and excavation)
- Existing unique or valuable vegetation and vegetation to be preserved
- Stockpile, waste storage, and vehicle storage/maintenance areas
Pre-Construction Stormwater Site Plan Reviews
What should a reviewer be looking for?

ESC BMPs

- Location and details for all structural and nonstructural ESC BMPs (e.g., silt fences, construction entrances, etc.)
- Location and details for any construction-phase BMPs or techniques used for LID BMP protection
- Intended sequence and timing of construction activities
Pre-Construction Stormwater Site Plan Reviews
What should a reviewer be looking for?

Permanent BMPs/Facilities (focus on LID)

- Total area of disturbed soils to be amended
- Retained trees and newly planted trees
- Adequate protection for retained trees
- Intended sequence and timing of construction activities

Broadview Green Grid Seattle, WA
Pre-Construction Stormwater Site Plan Reviews

What should a reviewer be looking for?

Soils Report

- Stamped by a scientist or engineer with the appropriate credentials
- Map showing the locations of the test pits or holes
- Detailed soil logs for each test pit or hole
- Meets infiltration rate testing and documentation requirements
Agenda

• Training logistics and objectives
• Project overview
• Permit requirements
• Pre-construction plan review
• **ESC checklists**
• Permanent BMP checklists
• Electronic checklist implementation
• Wrap up and evaluation
ESC Checklists
Overview

Erosion and Sediment Control (ESC) Inspection

- Initial ESC Inspection Checklist
- Construction ESC Inspection Checklist
- Post Construction ESC Inspection Checklist

Note: Factsheets have been developed for Eastern and Western Washington to support checklist implementation.
ESC Checklists
Overview

1. Objective
2. Project information
3. Inspection items
   - Grouped by Construction SWPPP element (#1-13)
   - BMP examples
4. Notes/comments
5. Summary of corrective actions
ESC Checklists
Overview: Project Information

1. Project/Location/Permit No.
2. Property Owner
3. Contractor
4. Inspector
5. CESCL
6. Inspection timing
   • After a holiday?
   • After a storm?
   • Before a predicted storm?
7. Documentation
8. LID BMPs?
   • Bioretention/Rain gardens
   • Permeable Pavement

Note: Check Ecology's online database to confirm that the CESCL has completed training: https://fortress.wa.gov/ecy/wqcescl/
**Initial ESC Inspection Checklist**

**Objective:** The initial erosion and sediment control (ESC) inspection should be conducted after the pre-construction meeting and installation of temporary best management practices (BMPs), but prior to any clearing, grubbing, or grading at the site. This inspection is required for sites that have a high potential for sediment transport.

**Initial ESC Inspection Items**

<table>
<thead>
<tr>
<th>Item #</th>
<th>Inspection Item</th>
<th>BMP Examples</th>
<th>Satisfactory?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 and 3</td>
<td>Are the following clearly marked?</td>
<td>• Flagging</td>
<td>□ Yes</td>
</tr>
<tr>
<td></td>
<td>• Project clearing limits/perimeter</td>
<td>• High visibility fence</td>
<td>□ Action required</td>
</tr>
<tr>
<td></td>
<td>• Sensitive/critical areas and buffers</td>
<td>• Silt fence</td>
<td>□ N/A</td>
</tr>
<tr>
<td></td>
<td>• Protected trees</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• LID BMPs (infiltration/ dispersion)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Has a stabilized construction entrance/exit been installed?</td>
<td>• Stabilized construction entrance/exit</td>
<td>□ Yes</td>
</tr>
<tr>
<td></td>
<td>• Wheel wash</td>
<td>• Stabilized construction entrance/exit</td>
<td>□ Action required</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Wheel wash</td>
<td>□ N/A</td>
</tr>
</tbody>
</table>
ESC Checklists
Initial ESC Inspection Checklist

Protect LID BMPs (infiltration/dispersion) and trees before construction:

- Clear marking of BMP areas
- Confirm protected trees are marked with high-visibility silt fence
- Drip line vs. root zone protection
# ESC Checklists

## Construction ESC Inspection Checklist

**Objective:** Inspections conducted during construction activities should verify proper installation and maintenance of required erosion and sediment control (ESC) best management practices (BMPs) and the protection of permanent stormwater BMPs/facilities.

<table>
<thead>
<tr>
<th>Item #</th>
<th>Inspection Item</th>
<th>BMP Examples</th>
<th>Satisfactory?</th>
</tr>
</thead>
</table>
| 1 and 13A | Are the following clearly marked and in good condition?  
- Project clear limits/perimeter  
- Sensitive/critical areas and buffers  
- Protected trees/vegetation  
- LID BMPs (infiltration/dispersion) | ▪ Flagging  
▪ High visibility fence  
▪ Silt fence | □ Yes  
□ Action required  
□ N/A |
| 2      | Is track-out of sediment prevented?  
▪ Stabilized construction entrance/exit  
▪ Wheel wash | □ Yes  
□ Action required  
□ N/A |
| 3A     | Are flow control facilities installed and functioning properly? | □ Yes  
□ Action required  
□ N/A |
| 3B     | If permanent flow control facilities are used for flow control during construction, are they protected from siltation? | □ Yes  
□ Action required  
□ N/A |
ESC Checklists
Construction ESC Inspection Checklist

Protect LID BMPs (infiltration/dispersion) and trees during construction:

- Flagging
- High visibility fence
- Silt fence
Protect LID BMPs: Siltation and Compaction

- Prevent siltation and overcompaction of subgrade
  - Appropriate construction sequencing
  - Proper equipment selection
  - Protective surfaces
Protect LID BMPs: Appropriate Construction Sequencing

- No excavation, soil placement, or soil amendment during wet or saturated conditions
Protect LID BMPs: Proper Equipment Selection

- Operate equipment adjacent to (not in) the facility
- Do not use heavy equipment with narrow tracks, narrow tires, or lugged high pressure tires
- Use draglines and trackhoes
- If machinery must operate in the facility, use light weight, low ground-contact pressure equipment
Protect LID BMPs: Protective Surfaces

- Waterproof tarps/plastic
- Steel plates
- Geotextile
ESC Checklists
Construction ESC Inspection Checklist

Protect LID BMPs: Proper Soil Amendments

- Four options for soil management (BMP T5.13 in the SWMMWW)
Protect LID BMPs: Appropriate Vegetation and Mulch

- Cell is not overfilled with mulch and bioretention soil media (BSM)
- Site is permanently stabilized

Source: Sustainable Saratoga
ESC Checklists
Construction ESC Inspection Checklist

Risk to trees during construction:

- Physical injury to trunk and crown
- Compaction in root zone
- Severed roots
- Smothered roots
- Increase wind and sunlight exposure
- Stress due to grade and drainage changes

## Post-Construction ESC Inspection Checklist

**Objective:** Post-construction inspections should verify full site stabilization and proper removal of temporary erosion and sediment control (ESC) best management practices (BMPs).

<table>
<thead>
<tr>
<th>Item #</th>
<th>Inspection Item</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>5A</td>
<td>Is the site fully stabilized?</td>
<td>□ Yes, proceed with inspection</td>
</tr>
<tr>
<td></td>
<td></td>
<td>□ No, stop inspection; provide feedback on additional stabilization needs</td>
</tr>
<tr>
<td>5B</td>
<td>Is vegetation (e.g., grasses, sod, trees) protected, well-established and meet the landscaping design specifications?</td>
<td>□ Yes □ Action required □ N/A</td>
</tr>
<tr>
<td>9A</td>
<td>Have waste and demolition materials been removed?</td>
<td>□ Yes □ Action required □ N/A</td>
</tr>
<tr>
<td>13</td>
<td>Have LID BMPs (infiltration and dispersion) been protected from:</td>
<td>□ Yes □ Action required □ N/A</td>
</tr>
<tr>
<td></td>
<td>• Siltation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Compaction</td>
<td></td>
</tr>
</tbody>
</table>
ESC Checklists
Post-Construction ESC Inspection Checklist

Site Closeout

- May have a 30-45 day follow-up inspection to confirm that ESC BMPs have been removed
- Verify site-specific O&M manual is in place
ESC Checklists
Post-Construction ESC Inspection Checklist

Treatment of damaged trees:

- Trunk and crown injuries
  - Prune to remove split, torn, broken, dead, or diseased branches
  - Remove loose bark
  - Install cables or bracing rods (consult with arborist)
  - Wound dressings (limited effectiveness)
- Irrigate
- Mulch (2- to 4-inch depth)
- Improve aeration in the root zone

Content from “Treatment of Trees Damaged by Construction” (International Society of Arboriculture, 2011):
https://www.treesaregood.org/portals/0/docs/treecare/ConstructionDamage.pdf
Group Activity #1
Group Activity #1

Instructions

Overview

You are a municipal stormwater inspector (Inspector) heading out to inspect a building development site where construction is ongoing. The activity moderator is the contractor (Contractor). Your objective is to ensure that proper Erosion and Sediment Control (ESC) is in place during construction. Watch out for cutting corners!

You should have the following materials

1. Example Site Map for Group Activity 1
2. Scenario Cards for Group Activity 1 (#1-#6)
3. A set of five checklists

Inspection details

- Date: Friday, November 2nd at 2PM
- Construction Phase: ESC BMPs are in place and crews are beginning excavation.
- Weather: Cloudy skies, rain in the forecast.
Case Studies

Photo Credit: Tami Tonder – City of Olympia
Agenda

- Training logistics and objectives
- Project overview
- Permit requirements
- Pre-construction plan review
- ESC checklists
- Permanent BMP checklists
- Electronic checklist implementation
- Wrap up and evaluation
Permanent BMPs/Facilities Inspection Checklists

Permanent BMPs/Facilities Inspection

- Construction of Permanent Stormwater BMPs/Facilities Inspection Checklist
- Post-Construction Permanent Stormwater BMPs/Facilities Inspection Checklist

Note: Factsheets have been developed for Eastern and Western Washington to support checklist implementation.
Permanent BMPs/Facilities Checklists
Construction of Permanent Stormwater BMPs/Facilities Inspection Checklist

Protect LID BMPs

Bioretention/Rain Gardens

Permeable Pavement

Note: Jurisdictions are encouraged to add checklist items for other types of permanent stormwater BMPs/facilities.
### Permanent BMPs/Facilities Checklists

#### Construction of Permanent Stormwater BMPs/Facilities Inspection Checklist

**Objective:** Inspections conducted during construction activities should verify proper installation and maintenance of permanent best management practices (BMPs).

**Bioretention/Rain Gardens Installation**

<table>
<thead>
<tr>
<th>Item #</th>
<th>Inspection Item</th>
<th>Applicable BMPs/Specifications</th>
<th>Satisfactory?</th>
</tr>
</thead>
</table>
| B-1    | Are curb and gutters blocked during _____? □ Bioretention soil media (BSM) installation □ Mulch installation □ Planting activities | • Block and gravel barrier  
          • Sandbag berm  
          • Rock berm | □ Yes  
          □ Action required  
          □ N/A |
| B-2    | Did appropriate actions occur following excavation and prior to BSM placement? | • Sediment deposits removed  
          • Subgrade raked/scarified to ≥ 3 inches | □ Yes  
          □ Action required  
          □ N/A |
| B-3    | Was the underdrain installed correctly?                                         | • Pipe meets design specs  
          • Aggregate meets design specs  
          • Not wrapped in geotextile fabric | □ Yes  
          □ Action required  
          □ N/A |
| B-4    | Was the BSM installed correctly?                                                | • Meets design specs  
          • < 6 inches per layer  
          • Compacted to 85% of maximum dry density | □ Yes  
          □ Action required  
          □ N/A |
Permanent BMPs/Facilities Checklists
Construction of Permanent Stormwater BMPs/Facilities Inspection Checklist

**Bioretention/Rain Garden Installation**

- Curb and gutters blocked at appropriate construction stages
- Subgrade raked/scarified prior to bioretention soil media (BSM) placement
- If compacted, aerate the BSM prior to planting
- Underdrain and aggregate (if included) meet design specs

![Image of Bioretention/Rain Garden Installation](image-url)
Bioretention/Rain Garden Installation

- BSM not placed during wet or saturated conditions
- BSM meets composition guidelines and depth
  - 60% sand/40% compost is the standard BSM mix
  - Review current lab report and visual/texture
  - Do not overfill BSM (ensure that required ponding depth is provided)

Permanent BMPs/Facilities Checklists

Construction of Permanent Stormwater BMPs/Facilities Inspection Checklist

Avoid foot traffic in the facility

Operate equipment adjacent to (not in) the facility
Permanent BMPs/Facilities Checklists

Construction of Permanent Stormwater BMPs/Facilities Inspection Checklist

Permeable Pavement Installation: Subgrade

- Design haul roads and sequence project to eliminate or minimize construction traffic on subgrade
- Rough grade to at least 6” above final grade
- Do not drive directly on finished subgrade
- Excavator backs out of installation on rough grade while excavating to final grade
Permeable Pavement Installation: Aggregate Base

- To finish subgrade, excavator pulls back on rough grade 6-12” above finish subgrade
- Do not drive directly on finished subgrade
- Install aggregate base by back-dumping and spreading on top aggregate base
Permanent BMPs/Facilities Checklists
Post-Construction of Permanent Stormwater BMPs/Facilities Inspection Checklist

[City/County Name]
[Department Name]
[Address Line 1]
[Address Line 2]

Post-Construction of Permanent Stormwater BMPs/Facilities Inspection Checklist

Objective: Post-construction inspection(s) should verify proper installation, maintenance, and performance of permanent best management practices (BMPs).

<table>
<thead>
<tr>
<th>Item #</th>
<th>Inspection Item</th>
<th>Status</th>
<th>Infiltration Test Results (if required)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-1</td>
<td>Bioretention</td>
<td>☐ Facility was installed as designed; no maintenance needed</td>
<td>Tested infiltration rate(s): __________</td>
</tr>
<tr>
<td></td>
<td></td>
<td>☐ Facility was not installed as designed</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>☐ Soils were scarified along the dispersion flow path, if disturbed</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>during construction</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>☐ Tested infiltration rate (if required) meets design infiltration rate</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>☐ Action required</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>☐ Maintenance required</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>☐ N/A</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>*Attach additional pages if necessary</td>
</tr>
<tr>
<td>P-1</td>
<td>Permeable pavement driveways</td>
<td>☐ Facility was installed as designed; no maintenance needed</td>
<td>5-gallon bucket test observations:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>☐ Facility was not installed as designed</td>
<td>☐ Scant amount of puddles runs off the</td>
</tr>
<tr>
<td></td>
<td></td>
<td>☐ Tested infiltration rate (if required;</td>
<td>☐ Significant runoff occurs</td>
</tr>
</tbody>
</table>
**Permanent BMPs/Facilities Checklists**

**Post-Construction of Permanent Stormwater BMPs/Facilities Inspection Checklist**

**Bioretention/Rain Garden Final Check**

- Verify final grade
- Verify contributing area as designed and stabilized
- Verify BSM not clogged and infiltration rate adequate (optional)
- Verify ponding depths, overflow, and bottom swale area
- Verify plants (type and density)
- Verify mulch (type and depth)

Source: Sustainable Saratoga
Permanent BMPs/Facilities Checklists
Post-Construction of Permanent Stormwater BMPs/Facilities Inspection Checklist

**Permeable Pavement Final Check:**
**Pervious Concrete and Porous Asphalt**

- Check for raveling (pressure washer test or other means)
- Check for uniform surface and non-sealing at the surface
- Coring to check for consistent density and depth
Permeable Pavement Final Check: Open-celled Plastic Grids

- Check staking per manufacturer
Permeable Pavement Final Check: Infiltration Testing

- 5-gallon bucket test – allowed for permeable pavement driveways
- ASTM C1701 – pervious concrete and porous asphalt
- ASTM C1781 – permeable pavers
- Observe during a rain event – open-celled grid systems

Permanent BMPs/Facilities Checklists
Post-Construction of Permanent Stormwater BMPs/Facilities Inspection Checklist
Group Activity #2
Group Activity #2

Instructions

Overview

You are a municipal stormwater inspector (Inspector) heading out to inspect a building development site where construction is ongoing. The activity moderator is the contractor (Contractor). Your objective is to ensure that LID BMPs have been protected, correctly installed, and properly maintained. Watch out for cutting corners!

You should have the following materials

1. Example Site Map for Group Activity 2
2. Scenario Cards for Group Activity 2 (#1-#6)
3. A set of five checklists
4. Bioretention Soil Media specifications (City of Seattle)

Inspection details

- **Date**: Monday, March 15th at 10AM
- **Construction Phase**: LID BMPs are at various stages of construction
- **Weather**: It rained yesterday; now skies are clear
Agenda

- Training logistics and objectives
- Project overview
- Permit requirements
- Pre-construction plan review
- ESC checklists
- Permanent BMP checklists
- **Electronic checklist implementation**
- Wrap up and evaluation
Electronic Checklist Implementation

Benefits

- Multiple inspectors → 1 centralized database
- Standardize data entry
- Auto-populate tracking information
- Enable photo attachments and reference materials
- Web-accessible, sharable maps for project tracking and communication

Options

- ESRI mobile applications (Collector, Survey123)
- Asset management software or mobile survey applications
- Custom logic to streamline forms
- Rugged/protected mobile devices
- Geodatabase can include enhanced functionality, tracking, and efficient data management

Note: Factsheets have been developed for Eastern and Western Washington to support checklist implementation.
Electronic Checklist Implementation

Streamlining

Hard Copy Checklist

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>Project/Permit Number:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location:</td>
<td></td>
</tr>
</tbody>
</table>

**Property Owner Information**
- Owner Name: __________________________
- Owner Phone Number: ________
- Owner Email Address: ________________

**Contractor Information**
- Contractor Name: __________________
- Lead Contact Name: ________________
- Lead Phone Number: _______________
- Lead Email Address: ________________

**Certified Erosion and Sediment Control Lead (CESCL)**
- CESCL Name: ________________
- CESCL Certification Expiration Date: ____________
- CESCL Phone Number: ________________
- CESCL E-mail Address: ________________

Is the inspection occurring:
- ☐ After a holiday?
- ☐ On a Friday afternoon?
- ☐ During a storm?
- ☐ Before a predicted storm?
- ☐ After a storm? (~24 hours)

Does the contractor have appropriate documentation onsite or within reasonable access to the site?
- ☐ Yes
- ☐ Action required
- ☐ N/A

Are any of the following BMPs present?
- ☐ Bioretention/Rain Gardens
- ☐ Permeable Pavement

See Construction of Permanent Stormwater BMPs/Facilities Inspection Checklist

Survey123 Demo Screenshot

Collapsible sections

Configure autofill for quick data entry

Multiple choice: check one or multiple

My Survey

- Project Information
- Property Owner Information
- Inspection Information
- Contractor Information
- Certified Erosion and Sediment Control Lead (CESCL)

Does the Contractor have appropriate documentation onsite or within reasonable access to the site?
- ☐ Yes
- ☐ Action required
- ☐ N/A

Are any of the following BMPs present?
Select all that apply:
- ☐ Bioretention/Rain Gardens
- ☐ Permeable Pavement

If LID BMPs are present, see Construction of Permanent Stormwater BMPs/Facilities Inspection Checklist
### Electronic Checklist Implementation

**Attachments, References, and Examples**

#### Hard Copy Checklist

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Is track-out of sediment prevented?</td>
<td>□ Yes □ Action required □ N/A</td>
</tr>
<tr>
<td></td>
<td>[Options: Stabilized construction entrance/exit, Wheel wash]</td>
<td></td>
</tr>
</tbody>
</table>

#### Survey123 Demo Screenshot

- **Element 2: Establish Construction Access**
  - Is track-out of sediment prevented?
    - [ ] Yes
    - [ ] Action required
    - [ ] N/A
  - **Notes or Action Required**
    - [Text Input]
  - **Photo**
    - [Camera Icon]
    - [Folder Icon]

- **Include example BMPs as a hidden pop-up for reference**
- **Consider adding other external references via hyperlink or embedded materials**
- **Option to attach photos or other documents**

---

*Note: Herrera Logo*
Electronic Checklist Implementation
Skip Logic

When bioretention is **NOT** present:

- **List Permanent Stormwater BMPs:**
  - Bioretention/Rain Gardens? *
    - Yes
    - No

- **Element 13: Protect Low Impact Development BMPs**
  
Streamlining Tip: Enable “skipping” to hide inspection items that aren’t relevant to the site.

VS.

When bioretention is **present**:

- **List Permanent Stormwater BMPs:**
  - Bioretention/Rain Gardens? *
    - Yes
    - No

- **Element 13: Protect Low Impact Development BMPs**
  
- **Bioretention/Rain Gardens Installation**
  - B-1. Are curb and gutters blocked during...?
    - Bioretention soil media (BSM) installation; mulch installation; planting activities
      - Yes
      - Action required
      - N/A
  
  - B-2. Did appropriate actions occur following excavation and prior to BSM placement?
    - Yes
    - Action required
    - N/A

  Other Notes/Comments

Survey123 Demo Screenshots
Agenda

- Training logistics and objectives
- Project overview
- Permit requirements
- Pre-construction plan review
- ESC checklists
- Permanent BMP checklists
- Electronic checklist implementation
- **Wrap up and evaluation**
Wrap-Up and Evaluation

Questions or Comments?

- Do you have a case study that you would like to share for a future training?

- Please complete the training evaluation form

Photo Credit: Jessica Knickerbocker – City of Tacoma
Wrap-Up and Evaluation

Questions or Comments?

- Encourage your colleagues to register for our upcoming trainings:
  - 12/11/18 – Edmonds – at capacity
  - Jan. 2019 – Vancouver, WA
  - Feb. 2019 – Redmond
  - Jan-Feb. 2019 – Tumwater/Lacey/Olympia

Checklists (Word and PDF), factsheets, and training materials can be found here: www.wastormwatercenter.org/stormwater-construction-site-inspection-resources