Philadelphia Water Department

Guidance Manual and Website Focus Group

May 8, 2015

Introductions – Staff & Consultants

Philadelphia Water Department

Ryan Blessing

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Today's Agenda

8:35 Regulation Update Recap

8:55 Guidance Manual Presentation

9:25 Questions & Answers

9:40 Break

9:50 Web Manual and ERSA Application Demo

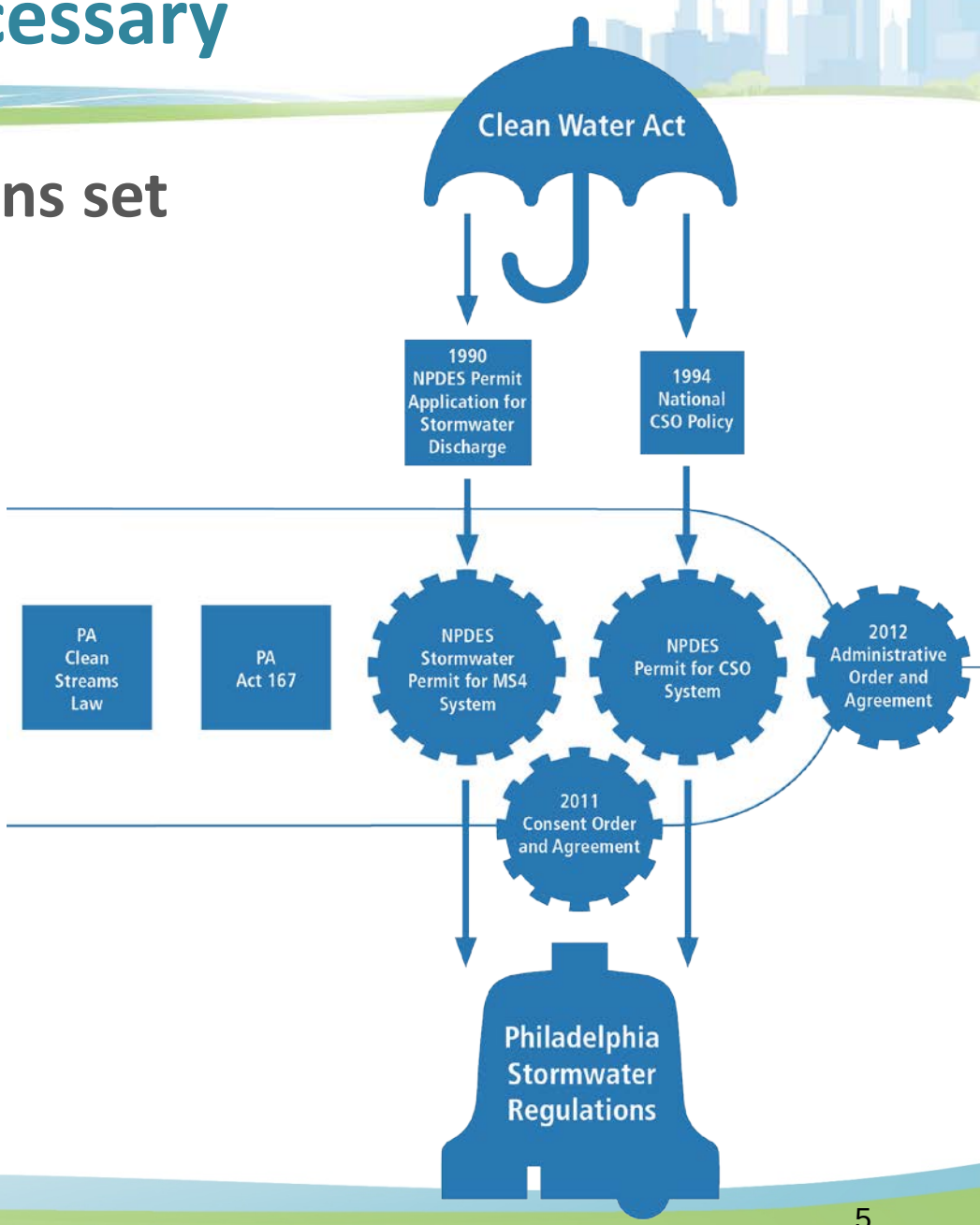
10:20 Questions & Answers

10:35 Recap & Closing

Regulations Update Recap

Why Changes are Necessary

- 2006: Current Regulations set
- Multiple Act 167 Plans Approved
- 2011: Consent Order & Agreement signed
  - Reduce overflows
  - Balance infrastructure capacity
  - Improve water quality
  - Reduce flooding



Why Changes are Necessary

- Effective for new projects submitting July 1, 2015
- All active projects will be grandfathered
  - Complete ERSA submission before July 1, 2015

Proposed Regulatory Changes

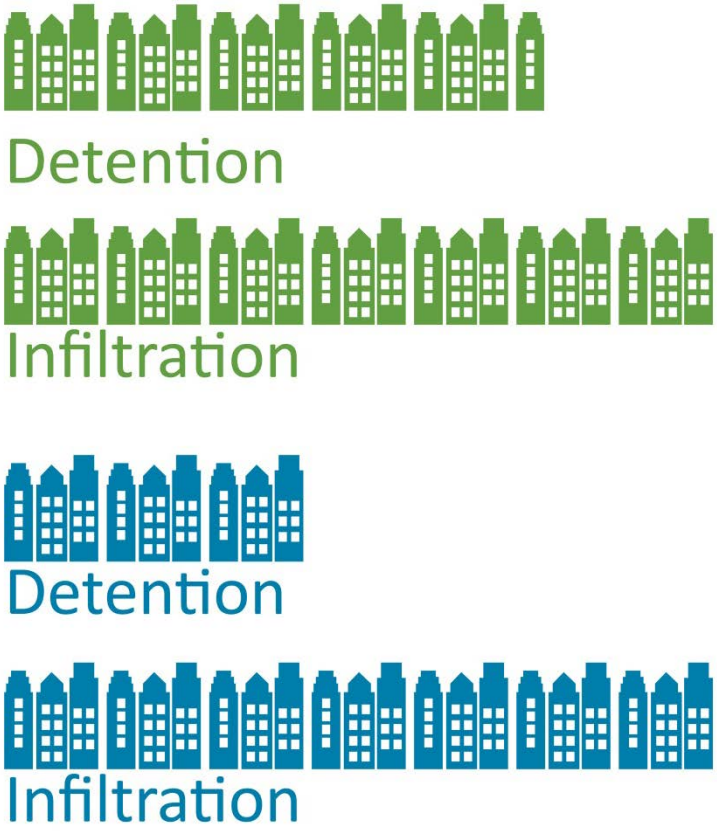
- Earth Disturbance Threshold
  - 15,000 ft^2 to 5,000 ft^2

DELAYED

- More Water
  - 1.5” Water Quality Volume
- Slower Water
  - 0.05cfs per acre-DCIA Release Rate
- Cleaner Water
  - 100% Pollutant Reducing

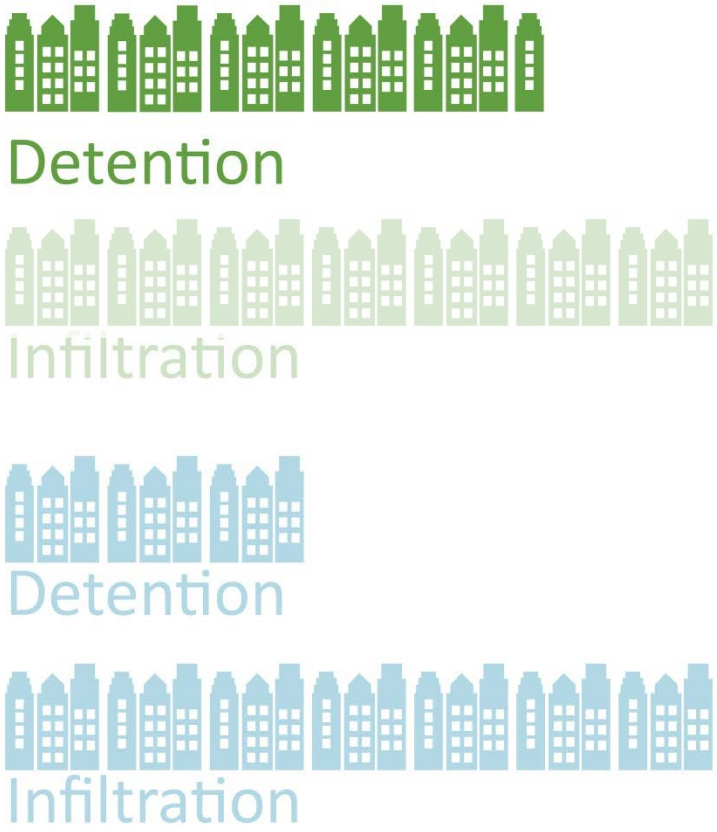
1.5” Water Quality Volume

- Applies to all development projects
- No adjustments to compliance approach
- Minimal cost increase
- Benefit directly from increased loading ratio requirement



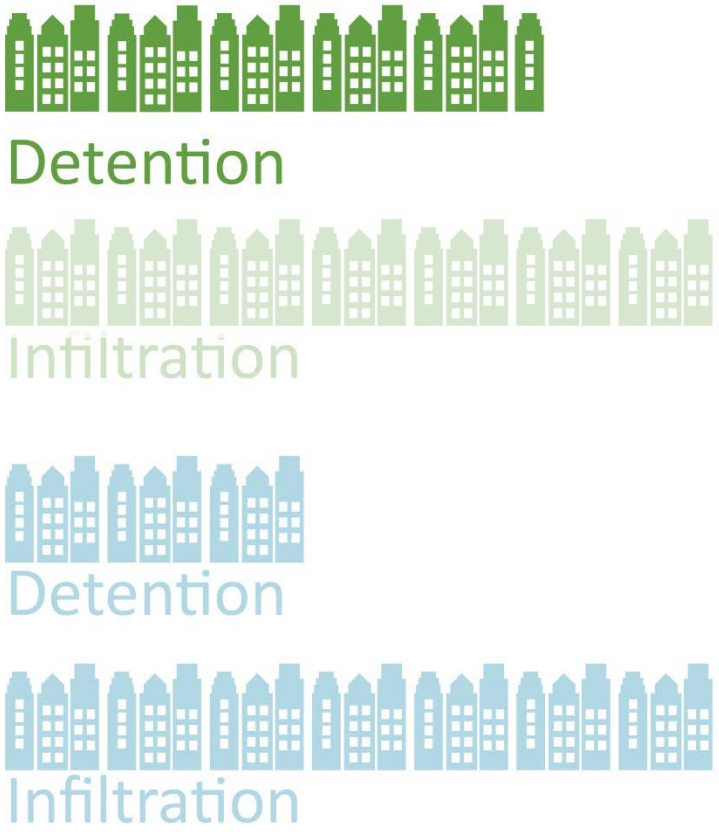
0.05 cfs/ac DCIA Release Rate

- Only applies to non-infiltrating combined sewer
- Calibrate with treatment plants
- Utilize decreased minimum orifice sizes
- Opportunity for proprietary rate control products



100% Pollutant Reducing

- Goal: Decrease the mass of pollutants to waterways
- Infiltrating and separate sewer projects already achieve this
- Existing green SMPs are still preferred
- New Compliance Tools
  - Vegetated Media Filters & Media Filters
  - Roof Runoff Isolation



Roof Runoff Isolation

- Clean rooftops are pollutant-reducing SMPs
- 0.05 cfs/ac Release Rate Still Applies
- Qualifying Criteria
  - Non-vehicular area
  - Not mixed with untreated runoff
  - Combined Sewer System only

July 2015 Technical Requirements

	Current	July 2015
Water Quality Volume	1.0”	1.5”
Water Quality Rate	0.24 cfs/acre	0.05 cfs/acre
WQ Treatment: MS4	100% Volume Reducing	100% Pollutant Reducing
WQ Treatment: Combined	20% Volume Reducing	100% Pollutant Reducing
Minimum Orifice Diameter	3 inches	1 inch (Traditional)
		½ inch (Underdrain)
Surface Loading Ratio	10:1	16:1
Subsurface Loading Ratio	5:1	8:1
Bioretention Soil Volume Credit	None	20% Void Space
Minimum Infiltration Rate	0.5 in/hr	0.4 in/hr
Disconnection Practices	------ *No Changes* ------	

Significant Process Improvements

- SMP Hierarchy
- Water Quality Bio Sizing Table
- Standard Details
- Expedited PCSMP Reviews
  - Surface Green
  - Disconnection Green
- Revised Guidance Manual
- Updated Plan Review website

Philadelphia's Stormwater Management Guidance Manual

(SWMGM) Version 3.0

SWMGM Version 3.0

SWMGM Version 2.1

Chapter 1: Introduction

Chapter 2: Applicability

Chapter 3: Site Planning

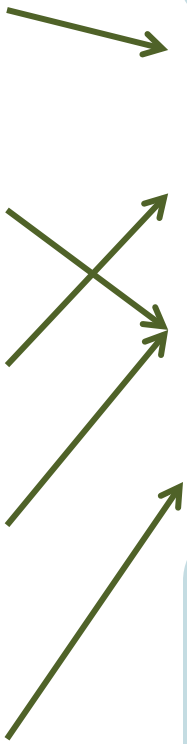
Chapter 4: Integrated Site Design

Chapter 5: Post-Construction Stormwater Management Plans

Chapter 6: Utilizing Existing Site Features

Chapter 7: SMP Design Guidelines

Chapter 8: Landscape Guidance



SWMGM Version 3.0

Introduction NEW

Chapter 1: Regulatory Requirements

Chapter 2: Submission, Review, and Approval Procedures

Chapter 3: Site Design and Stormwater Management Integration

Chapter 4: SMP Guidance

Chapter 5: Construction Guidance

Chapter 6: Post-Construction and Operations & Maintenance Guidance

NEW

SWMGM Introduction

- **Introduction Sections**
  - Manual Organization and Purpose
  - PWD Stormwater Plan Review
  - Stormwater Management in Philadelphia
  - Applicability and Submission Process
  - Preferred Design Approach
- **Highlights**
  - Provide Regulatory background for clients
  - The Stormwater Plan Review Program
  - Concise Summary

Chapter 1: Regulatory Requirements

- **Chapter 1 Sections**
  - Introduction
  - Applicability Factors
  - Stormwater Regulations
- **Highlights**
  - Clarifying Applicability: Three Factors
  - Clarifying Requirements
    - Background
    - Requirement
    - Exemptions

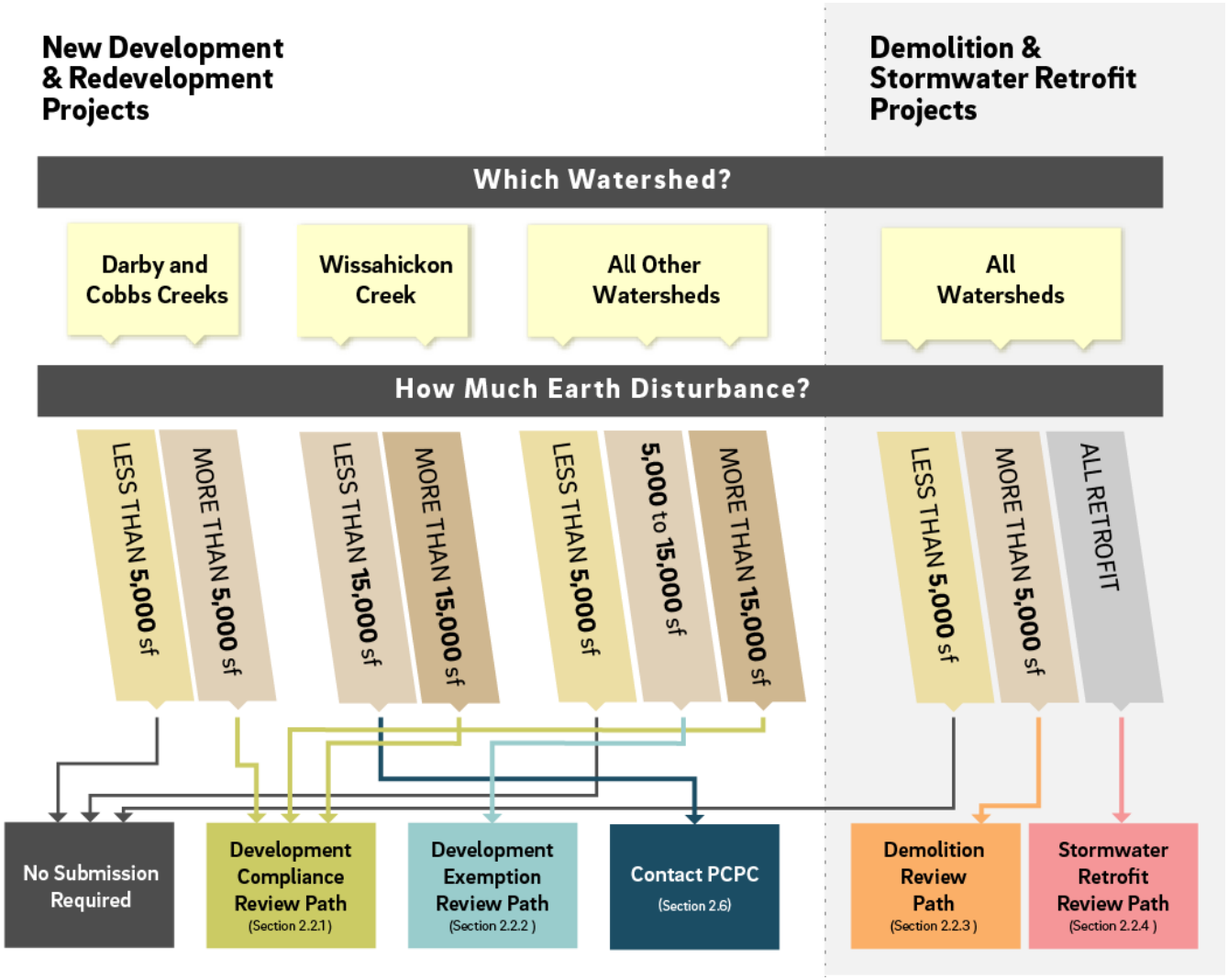
Chapter 2: Submission, Review, and Approval

- **Chapter 2 Sections**
  - Introduction
  - Existing Resources and Site Analysis
  - Review Paths
  - Review Phases
  - Expedited PCSMP Reviews
  - PWD's Development Review Process
  - PWD's Role in Philadelphia's Development Process
  - PWD and PA DEP

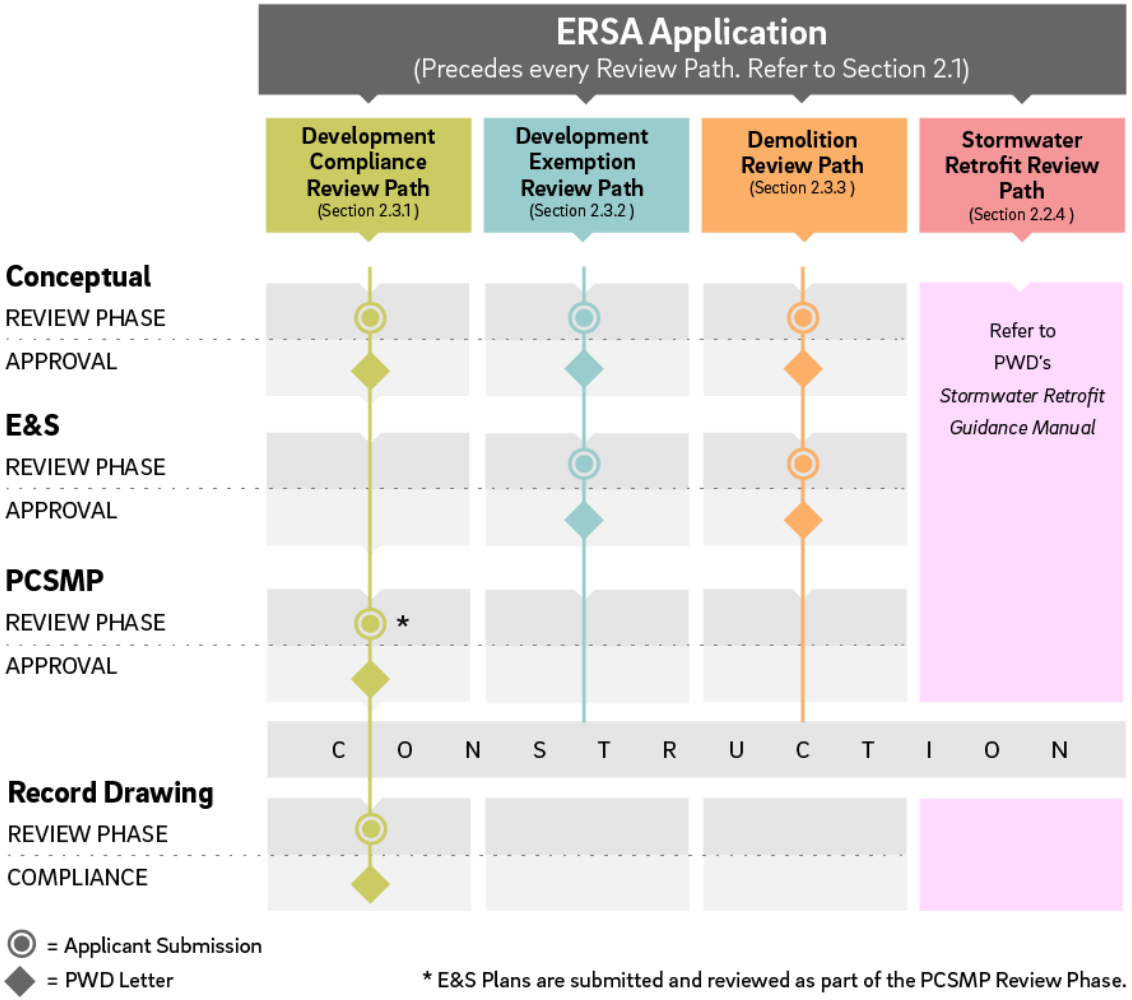
Chapter 2: Submission, Review, and Approval

- **Highlights**
  - Review Paths and Phases

Project Review Path Determination



Summary of Review Phases for Each Review Path



Chapter 2: Submission, Review, and Approval

- **Highlights**
  - Review Paths and Phases
  - Process Flow Charts
  - Expedited PCSMP Reviews

Existing Expedited PCSMP Review Guidance

4.2.1 Green Project Review

PWD offers a Green Project Review for redevelopment projects that are able to disconnect 95% or more of the impervious area in the post construction condition. When performing a Green Project Review, PWD is committed to providing review of the stormwater management component within five (5) business days of receipt of a complete project submittal. A Green Project Review is exempt from Channel Protection and Flood Control stormwater requirements. To be eligible for a Green Project Review a project must meet the following criteria:

- Project is redevelopment;
- 95% or more of the post construction impervious area is disconnected;
- Project may not adversely impact or further exacerbate rates and quality of runoff contributing to public infrastructure; and
- Public Health and Safety issues may preclude a project from a Green Project Review.

The submittee **MUST** identify their project as eligible for a Green Project Review in the letter of transmittal sent with the technical submittal. PWD may not be able to provide review comments within five (5) business days without this notification. For more information or to determine if a project is eligible for a Green Project Review, please contact PWD.

Chapter 2: Submission, Review, and Approval

- **Highlights**
  - Review Paths and Phases
  - Process Flow Charts
  - Expedited PCSMP Reviews
  - PWD Unit Reviews
  - PWD and City Departments
  - Submission Package Checklists

Chapter 3: Site Design and SWM Integration

- **Chapter 3 Sections**
  - Introduction
  - Site Assessment
  - Stormwater Management Design Strategies
- **Highlights**
  - Discussion of Preferred Design Approach
  - Acceptable Non-Infiltrating Pollutant-Reducing Practices

Non-Infiltrating Pollutant-Reducing Practices

	Section	Combined Sewer Area	Separate Sewer Area or Direct Discharge
Bioretention	4.1	Yes	Yes
Porous Pavement DIC	4.2	Yes	Yes
Green Roofs	4.3	Yes	Yes
Cisterns	4.5	Yes	Yes
Blue Roofs	4.6	Yes	No
Ponds and Wet Basins	4.7	Yes	Yes
Vegetated Media Filters	4.9	Yes	Yes
Media Filters	4.9	Yes	Yes
Roof Runoff Isolation*	3.2.4	Yes	No

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  - Discussion of Preferred Design Approach
  - Acceptable Non-Infiltrating Pollutant-Reducing Practices
  - SMP Hierarchy

SMP Hierarchy

SMP	Section	Preference Level
Bioinfiltration	4.1	Highest
Bioretention	4.1	Highest
Porous Pavement	4.2	Highest
Green Roofs	4.3	Highest
Subsurface Infiltration	4.4	Medium
Cisterns	4.5	Medium
Blue Roofs	4.6	Medium
Ponds and Wet Basins	4.7	Medium
Subsurface Detention with Vegetated Media Filters	4.8 / 4.9	Lowest
Subsurface Detention with Roof Runoff Isolation	4.8 / 3.2.4	Lowest
Subsurface Detention with Media Filters	4.8 / 4.9	Lowest
Vegetated Media Filters	4.9	Lowest
Media Filters	4.9	Lowest

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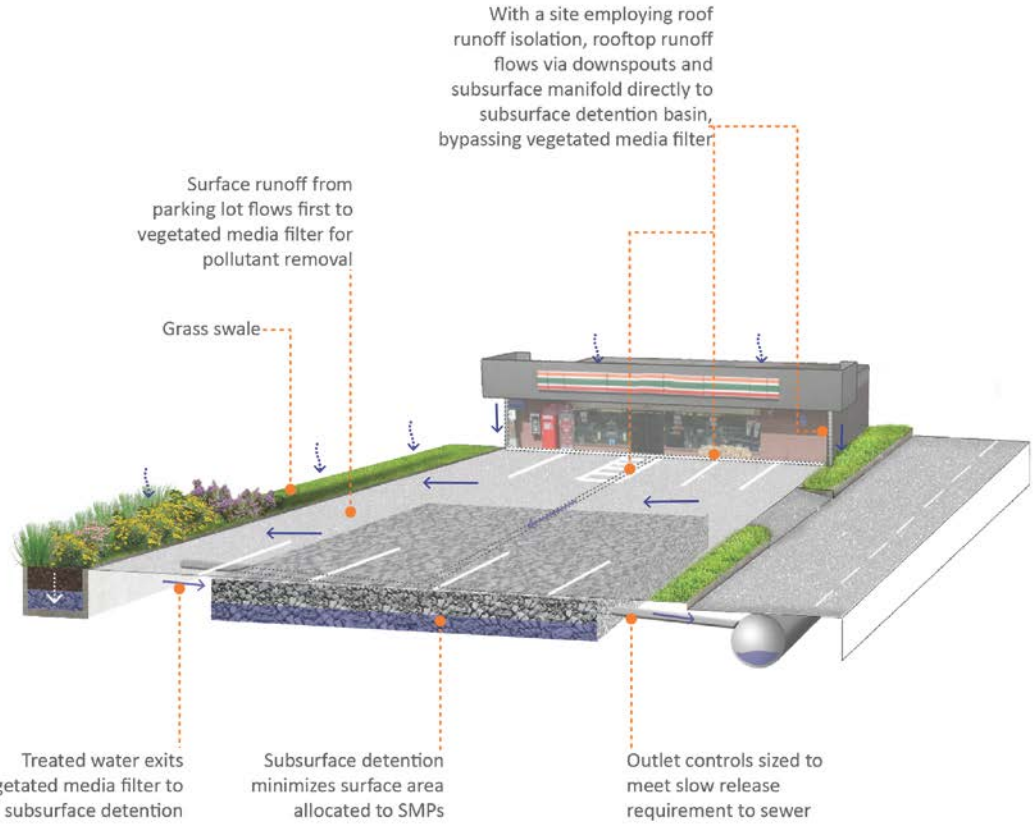
  - SMP Hierarchy
  - SMPs in Series

SMPs in Series Example:
Vegetated Media Filter with Subsurface Detention



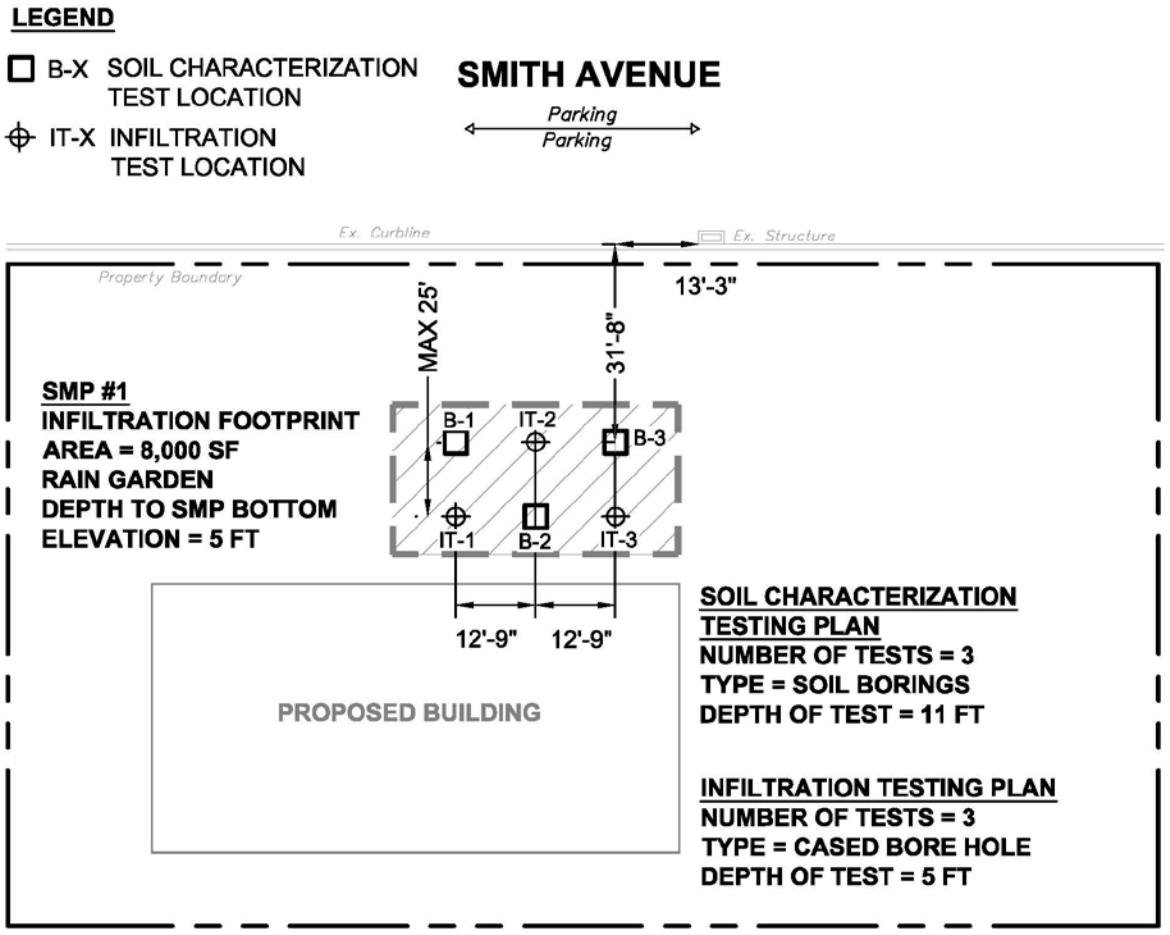
Chapter 3: Site Design and SWM Integration

- **Chapter 3 Sections**
  - Introduction
  - Site Assessment
  - Stormwater Management Design Strategies
- **Highlights**
  - Discussion of Preferred Design Approach
  - Acceptable Non-Infiltrating Pollutant-Reducing Practices
  - SMP Hierarchy
  - SMPs in Series
  - Stormwater Management Trading

Chapter 3: Site Design and SWM Integration

- **Chapter 3 Sections**
  - Infiltration Testing and Soil Assessment for SMP Design
  - How to Show Compliance
  - Integrated Stormwater Management Examples
- **Highlights**
  - Comprehensive Infiltration Testing Guidance

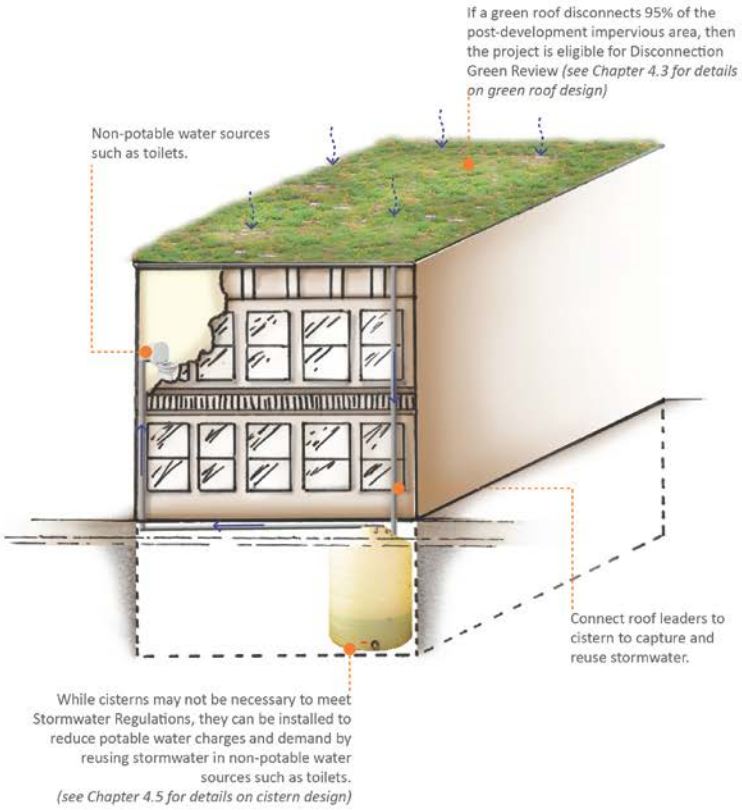
Example Soil Characterization and Infiltration Testing Plan



Chapter 3: Site Design and SWM Integration

- **Chapter 3 Sections**
  - Infiltration Testing and Soil Assessment for SMP Design
  - How to Show Compliance
  - Integrated Stormwater Management Examples
- **Highlights**
  - Comprehensive Infiltration Testing Guidance
  - Compliance Calculations & Documentation Requirements
  - Calculation Methods & Design Tools
  - Design Examples

Design Example: Full Build-Out, Green Roof



Chapter 4: SMP Guidance

- **Chapter 4 Sections**
  - Introduction
  - Stormwater Management Practices
  - Systems that Support SMP Function
    - Pretreatment
    - Inlet Controls
    - Outlet Controls

Chapter 4: SMP Guidance

- **Highlights**
  - Standardized Format
    - Description
    - Applicability
    - Key Advantages and Limitations
    - Key Design Considerations
    - Design and Material Standards
    - Construction and Maintenance Guidance

Chapter 4: SMP Guidance

- **Highlights**
  - Recommendations vs. Requirements

Recommendations vs. Requirements

Key Design Considerations for Bioinfiltration/Bioretention

- Bioinfiltration/bioretention SMPs should be considered as an alternative before designing subsurface infiltration and detention SMPs. Bioinfiltration/bioretention SMPs are preferred for a number of reasons, including installation and maintenance cost, ease of maintenance, habitat creation, nutrient cycling, and aesthetics.
- The pretreatment approach should be matched to site characteristics. Bioinfiltration/bioretention SMPs rely on flow through soil media to provide Water Quality treatment. Media layers can become clogged, particularly when runoff has high quantities of sediment. To avoid this, SMPs managing runoff from surfaces that generate high sediment loads should have adequate pretreatment to remove dirt and grit before they reach the bioinfiltration/bioretention SMP.

General Design Standards

1. The maximum allowable drain down time is 72 hours.
2. The maximum allowable DCIA to SMP footprint loading ratio is 16:1.
3. Positive overflow must be provided for large storm events, up to and including the 100-year storm. Overflow structures and pipes must be designed to convey at least the ten-year 24-hour storm.
4. The minimum allowable distance between infiltration SMPs and any adjacent private property line is ten feet. It is acceptable for SMPs to be located directly adjacent to the public right-of-way.
5. The minimum allowable distance between infiltration SMPs and any building foundation is 10 feet.

Chapter 4: SMP Guidance

- **Highlights**
  - Requirements vs. Recommendations
  - SMP One-Sheets

SMP One-Sheets

Bioinfiltration /Bioretention

Description

Bioinfiltration and bioretention SMPs, often referred to as rain gardens, are vegetated depressions or basins that use surface storage, vegetation, planting soil, outlet controls, and other components to treat, detain, and retain stormwater runoff. Bioinfiltration and bioretention SMPs represent the highest level of preference in PWD's SMP Hierarchy by providing high-performance and cost-effective stormwater management, green space, and triple bottom line benefits.

Both types of SMPs reduce pollution in and volume of stormwater by filtering runoff through a vegetated soil medium that promotes evapotranspiration. Bioinfiltration SMPs remove stormwater via infiltration into the surrounding soils while bioretention SMPs attenuate runoff with flow-regulating underdrains. Bioinfiltration/bioretention SMPs can be found in a variety of configurations from relatively large and open vegetated basins to small scale SMPs contained within flow-through planter boxes.

Key Advantages

- Flexible layout and easy to incorporate in landscaped areas
- Very effective at removing pollutants and reducing runoff volumes
- Generally one of the more cost-effective stormwater management options
- Relatively low cost maintenance activities
- Can contribute to better air quality and help reduce urban heat island impacts
- Can improve property values and site aesthetics through attractive landscaping
- Eligible for inclusion in an Expedited PCSMP Review project

Key Limitations

- May need to be combined with other SMPs to meet the Flood Control requirement
- May have limited opportunities for implementation due to the amount of open space available at the site

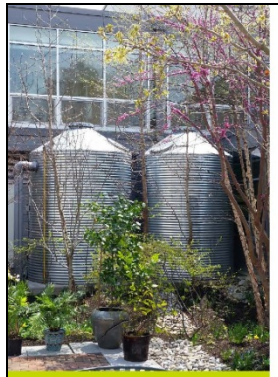
DEVELOPMENT ATTRIBUTES

Construction Costs	LOW
Operations & Maintenance Costs	MODERATE
Likeliness of Failure	LOW
Ground-Level Encroachment	HIGH
Building Footprint Encroachment	MODERATE
Triple Bottom Line Benefits	HIGH

COMPLIANCE ATTRIBUTES

Water Quality Effluent Pollutant Load: **Bioinfiltration**	Water Quality Effluent Pollutant Load: **Bioretention**	Water Quality Infiltration & Volume Reduction: **Bioinfiltration**	Water Quality Infiltration & Volume Reduction: **Bioretention**	Water Quality Evapotranspiration	Water Quality Rate Control	Channel Protection /Flood Control /PHS Rate Control
LOW	MODERATE	HIGH	MODERATE	MODERATE	Yes	MODERATE

A description of each evaluated attribute can be found in the SMP Hierarchy Ranking Criteria in Section 3.2.4.



Cisterns

Description

Cisterns are storage tanks, located either above or below ground, that hold rainwater for beneficial reuse. Cisterns are multi-function systems that help to meet the Stormwater Regulations and collect water for reuse. Rainwater may be collected from rooftops or other impervious surfaces and conveyed to cisterns for storage. Stored water may drain by gravity or be pumped to its ultimate end use.

Key Advantages

- Can be used to provide rate control within small/constrained spaces
- Decrease demand on the municipal water supply and water costs for the end user, when used as part of a rainwater harvesting system in accordance with City, State, and Federal code restrictions
- Can be sited, through flexible design options, beneath lawns, recreational areas, parking lots, other impervious areas, or within buildings when space constraints exist
- Provide educational benefits, especially at public and/or highly visible sites

Key Limitations

- May not be able to fully meet the Water Quality requirement
- Limited to circumstances where there is a year-round water demand that can replenish storage capacity between storms
- May be subject to additional City, State, and Federal code restrictions
- Require draining before a freeze when located on the surface, to prevent structural damage
- Require strict adherence to regularly-scheduled inspections because the maintenance needs are not easily visible
- Does not improve aesthetics or provide the ancillary environmental benefits associated with vegetated SMPs, such as habitat creation and improved air quality

DEVELOPMENT ATTRIBUTES

Construction Costs	LOW
Operations & Maintenance Costs	MODERATE
Likeliness of Failure	MODERATE
Ground-Level Encroachment	MODERATE
Building Footprint Encroachment	LOW
Triple Bottom Line Benefits	MODERATE

COMPLIANCE ATTRIBUTES

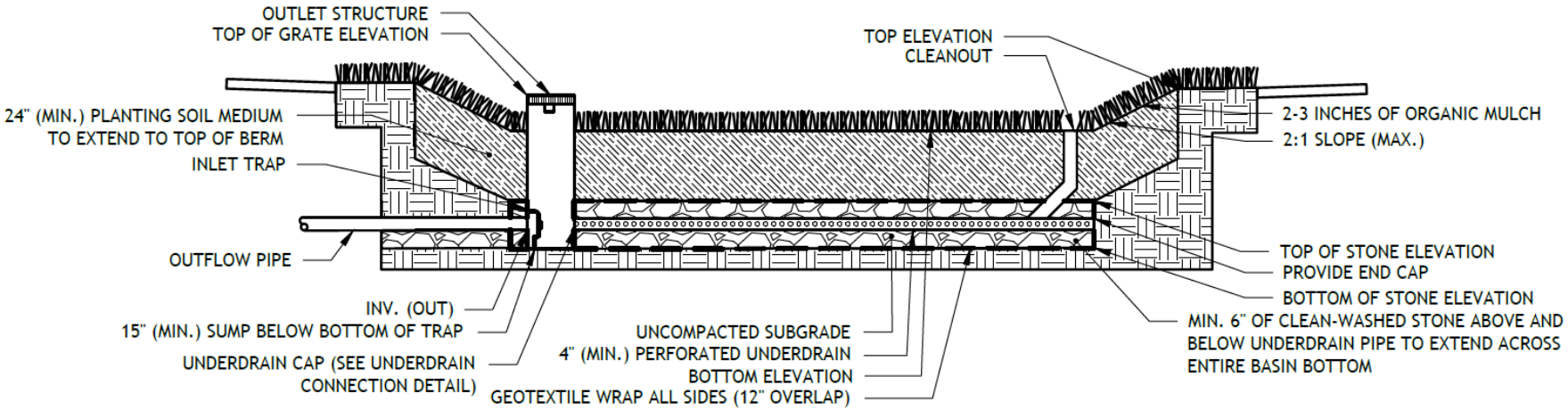
Water Quality Effluent Pollutant Load	Water Quality Infiltration & Volume Reduction	Water Quality Evapotranspiration	Water Quality Rate Control	Channel Protection /Flood Control /PHS Rate Control
MODERATE	MODERATE	LOW	Yes	MODERATE

A description of each evaluated attribute can be found in the SMP Hierarchy Ranking Criteria in Section 3.2.4.

Chapter 4: SMP Guidance

- **Highlights**
  - Requirements vs. Recommendations
  - SMP One-Sheets
  - Standard Details

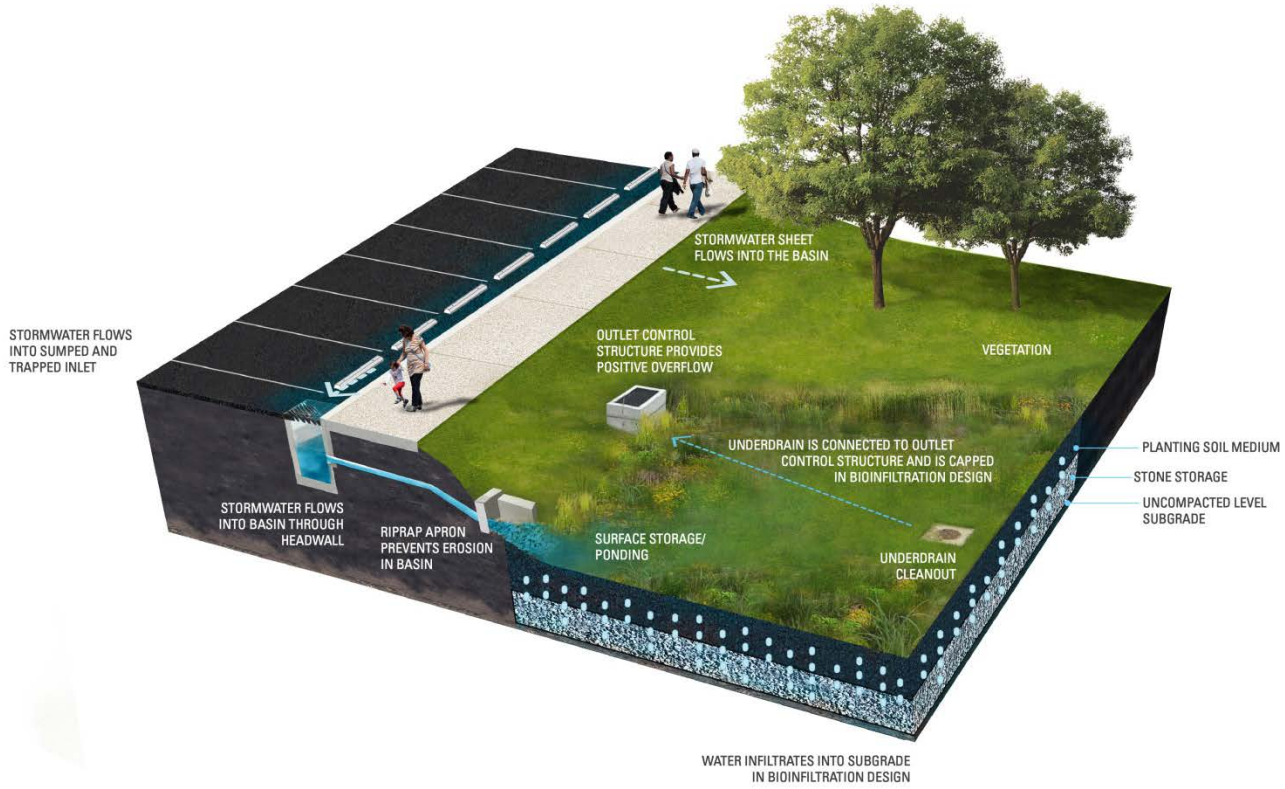
Bioinfiltration/Bioretention Basin Standard Detail



Chapter 4: SMP Guidance

- **Highlights**
  - Requirements vs. Recommendations
  - SMP One-Sheets
  - Standard Details
  - Renderings

Bioinfiltration/Bioretention Basin with Typical Features



Chapter 5: Construction Guidance

- **Chapter 5 Sections**
  - Introduction
  - Construction Inspections
  - Common Construction Issues
  - Construction Documentation
- **Highlights**
  - Discussion of Requirement Documentation
  - New Content to Outline the Process

Chapter 6: Post-Construction and O&M Guidance

- **Chapter 6 Sections**
  - Introduction
  - Operations and Maintenance
  - SMP Inspection Guidance
  - Stormwater Credits Program
- **Highlights**
  - Routine Maintenance for Property Owners
  - Stormwater Credit Opportunities

Appendices

- **New Appendices**
  - Plan and Report Checklists
  - Updated Design Guidance Checklist
  - Updated Design Compliance Worksheets
  - Infiltration Testing Log
  - Record Drawing Sample

Questions

- What do you think about the new organization of the guidance manual?
- Is there content in the current guidance manual that is unclear? Do you think we have addressed that content with this update? If not, how can we do so in the future?
- Do you have other questions about the guidance manual that we didn’t answer?
- Please have a spokesperson for your table identify the top 3 takeaways from your conversation.

BREAK

Web Manual and ERSA Application Demo

- **The Tactile Group**
- Founded in 2004
- Specializing in responsive websites and web applications
- Non-profit, Fortune 500, Municipal & Federal clients
- Collaborative and iterative design and development process
- Offices in Center City Philadelphia & Washington, DC

Questions

- What features that we've shown do you think you will use the most? Are there additional features not included you would like to see?
- Do you think the online format will make it easier to find what you need?
- Do you think you will use the website on a cell phone or mobile device?
- Please have a spokesperson for your table identify the top 3 takeaways from your conversation.

Closing

- Guidance Manual release
  - Early June
- Information Sessions
  - June 19, 23, 30
  - July 9, 16
- Web Survey
- E-mail Questions: PWD.PlanReview@phila.gov
- www.PhillyWatersheds.org/StormwaterRegulations