

Water Environmental Services

Sanitary and Stormwater Rules and Standards Workshop #3

September 25 | 2018

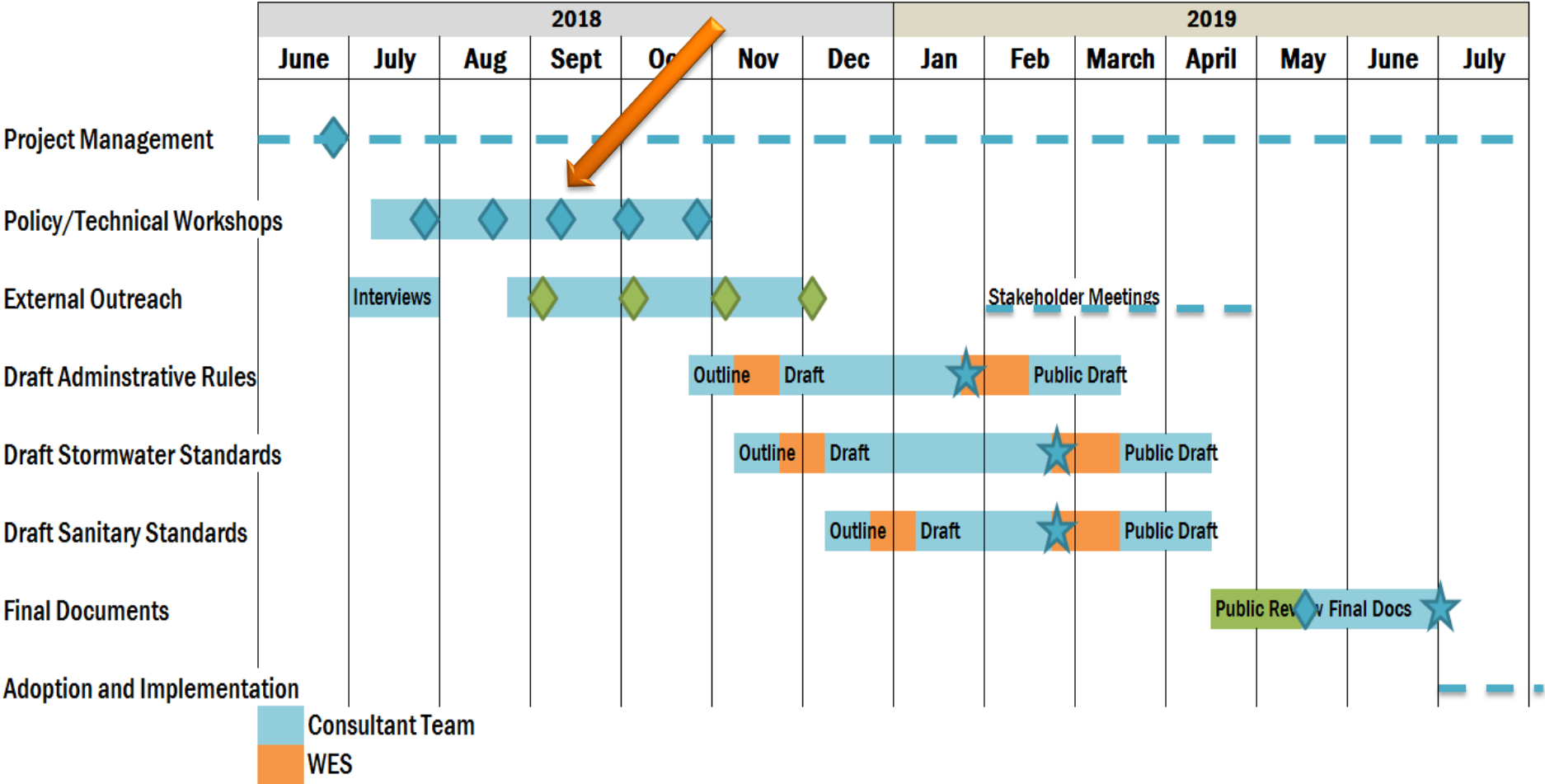


Today's Agenda

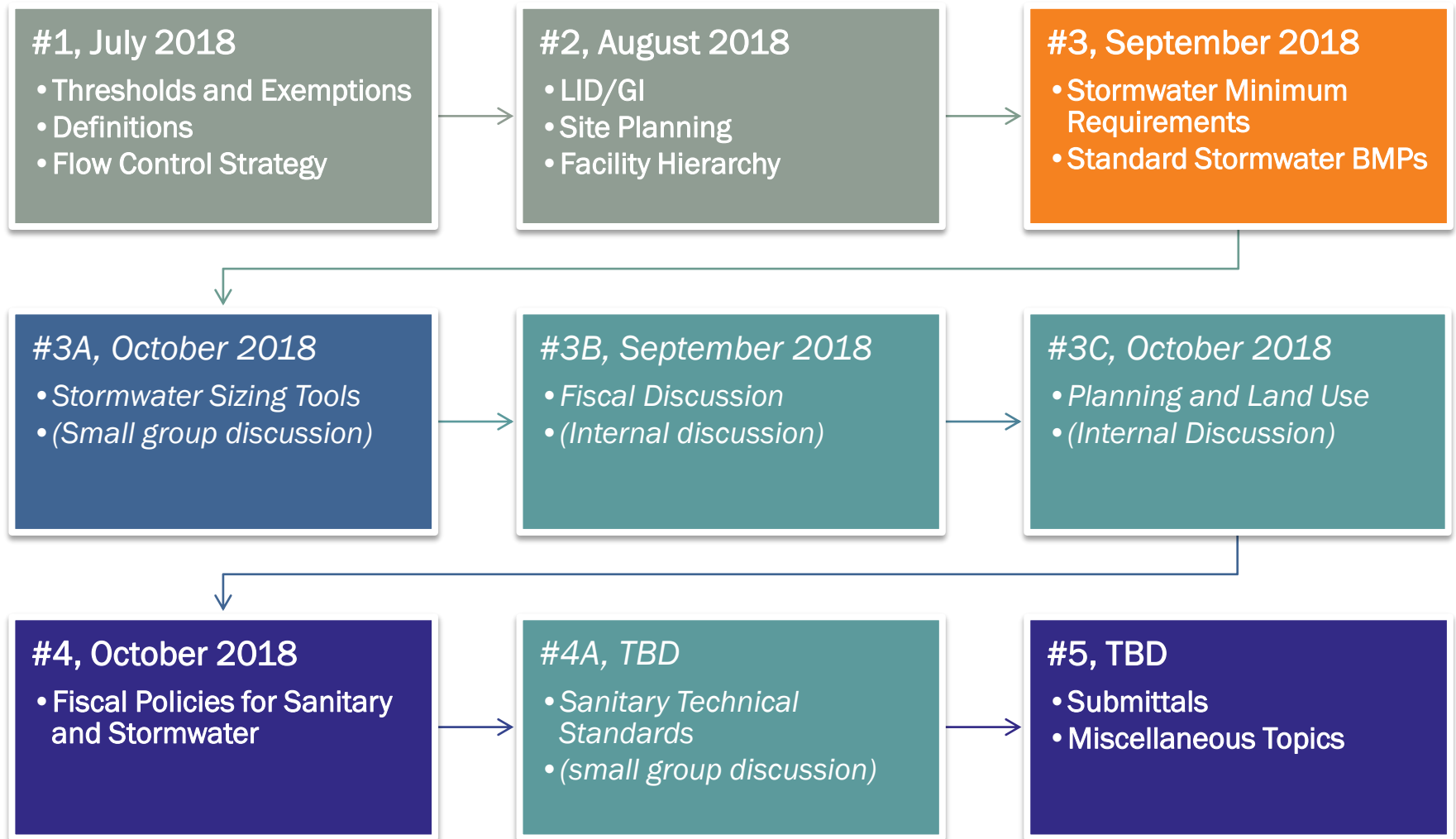
- Project Update
 - Updated Workshop Plan
 - Workshop #2 Recap
 - Stakeholder Interview Summary
- Policy and Technical Issues
 - Stormwater Minimum Requirements
 - Stormwater Facility Types and Use Guidelines
- Wrap-Up

Project Update

Process Overview



Updated Workshop Plan



Workshop #2 Recap

LID/GI and Facility Hierarchy



- Decisions Reached
 - Clarified definitions and exemptions
 - Include LID information and opportunities in standards
 - No specific site design requirements related to LID
 - Include site planning checklist to document opportunities and choices
 - Address stormwater requirements early in the planning process
 - Facility hierarchy will be focused on “infiltration first” but not require any specific BMP over another
- Further Discussion Needed
 - Standards for rural areas
 - Infiltration infeasibility criteria
 - Specific facility list

Public Outreach Stakeholder Interview Summary

- General themes:
 - Type of development should lend to greater flexibility in meeting requirements, especially stormwater.
 - Rules/standards having a significant impact on the cost of development – housing and affordability.
- Current implementation can be frustrating:
 - Lack of consistency with interpretation of the existing rules/standards
 - Creation of additional “in-house-policies” on a case by case basis
 - Sanitary rules/standards are easier to apply than stormwater rules/standards.
- Technical challenges:
 - Infiltration rate (or lack thereof) was the #1 technical challenge
 - Desire for a BMP sizing tool or some kind of sizing calculator method.

Stakeholder Task Force Meetings

October 11

October 25

November 15

December 13

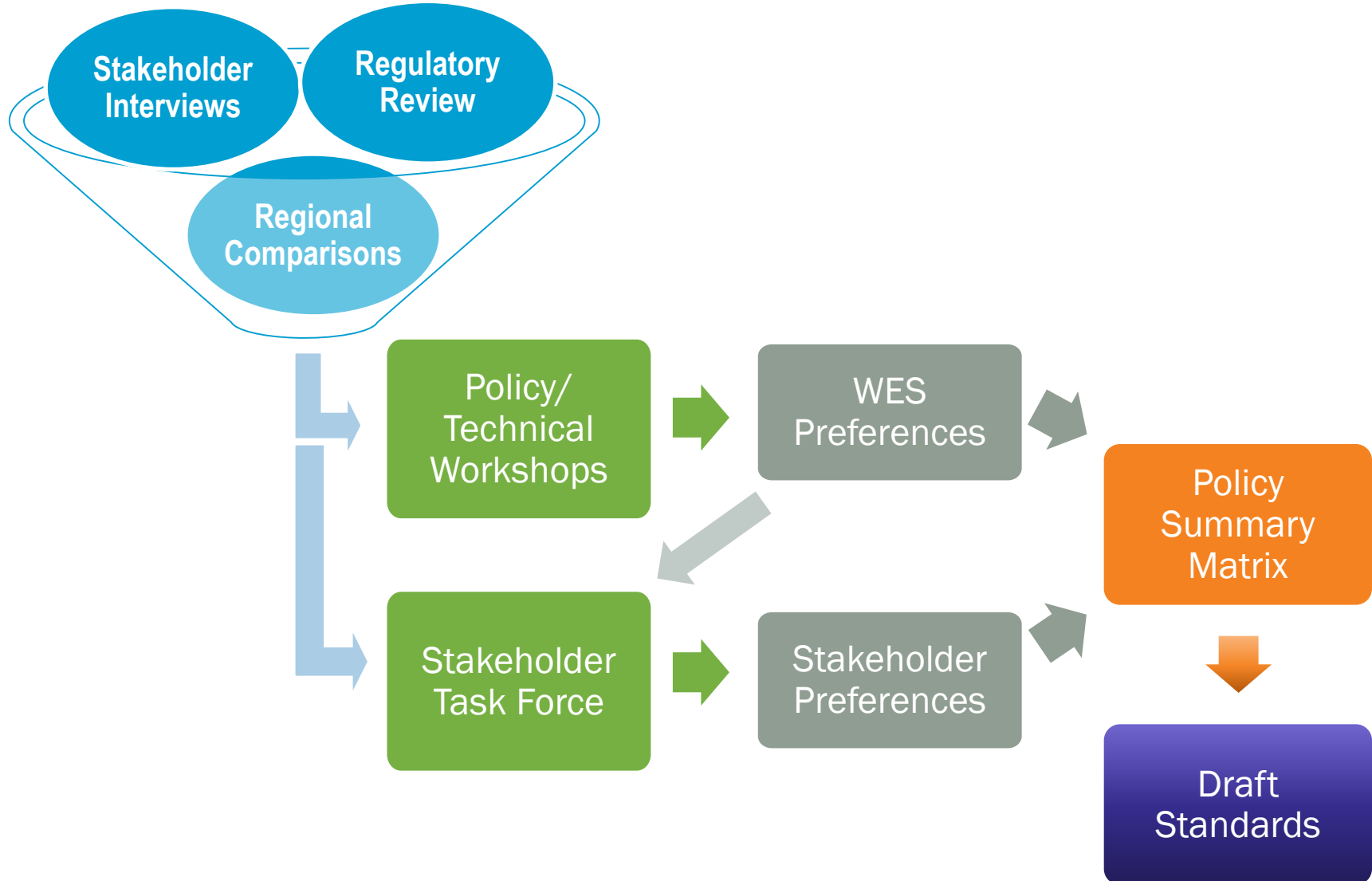
Policy and Technical Issues Discussion

Stormwater Minimum Requirements
Facility Selection and Use Guidelines

Policy and Technical Issues



Policy Setting Process



Stormwater Minimum Requirements

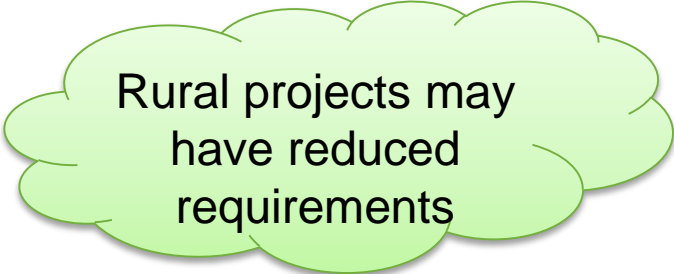
Stormwater Minimum Requirements

Options and Feedback

- Stormwater Site Plans
- Drainage Report
- ESPC
- Source Control
- Site Design/LID → Infiltration Feasibility/Site Planning
- Water Quality Treatment
- Flow Control
- Operations and Maintenance
- Permits
- UICs
- Geotechnical Analysis
- Downstream Analysis
- Conveyance
- Natural Systems
- Wetlands Protection
- Sensitive Areas / Buffers
- Easements
- Stormwater Master Planning
- Combined Systems

Stormwater Minimum Requirements Options

- Minimum Requirements
 1. ESPC
 2. Source Control
 3. Infiltration Feasibility/Site Planning
 4. Water Quality Treatment
 5. Flow Control
 6. Downstream Analysis
 7. Conveyance?
 8. Natural Resource Protection?
 9. Operations and Maintenance
- Submittals Discussion
 - Stormwater Site Plans
 - Drainage Report
 - Permits
 - Geotechnical Analysis
 - Easements



Rural projects may have reduced requirements

#1 Erosion Prevention and Sediment Control



Disturbance Area

Permit Type(s) Needed

Gladstone, Rivergrove, and WES service districts: SWMACC & CCSD#1
(excluding Happy Valley)

800 sq. ft. to less than 1 acre of disturbance (thru all phases)

- WES EPSC Permit

1 acre to less than 5 of disturbance (thru all phases)

- WES EPSC Permit
- 1200-CN permit granted through WES, (automatically granted as part of the WES EPSC Permit)

5 acres or more of disturbance (thru all phases)

- WES EPSC Permit
- 1200-C permit through DEQ

All other areas in Clackamas County

1 acre or more of disturbance (thru all phases)

- 1200-C permit from DEQ
(Check with DEQ)

- Clackamas County Erosion Prevention Planning and Design Manual
- Documentation: EPSC Plan or DEQ Permit

#2 Source Control

- Specific site design elements required for high pollutant site uses
- Examples: cover, separation, area drains, connection to sanitary, spill control manholes, oil/water separators, etc.
- Industrial Stormwater Permit required for specific site uses (1200-Z)
- Documentation
 - Source controls described in Stormwater Report
 - Source controls shown on preliminary and final plans
 - 1200-Z permit when applicable

- Site Uses from 2010 Draft
 - Fuel dispensing facilities
 - Above ground storage of liquid materials
 - Solid waste storage/trash compactors
 - Exterior storage of bulk materials
 - Material transfer/loading docks
 - Equipment/vehicle wash facilities
 - Covered vehicle parking areas
 - Industrial/commercial high traffic areas

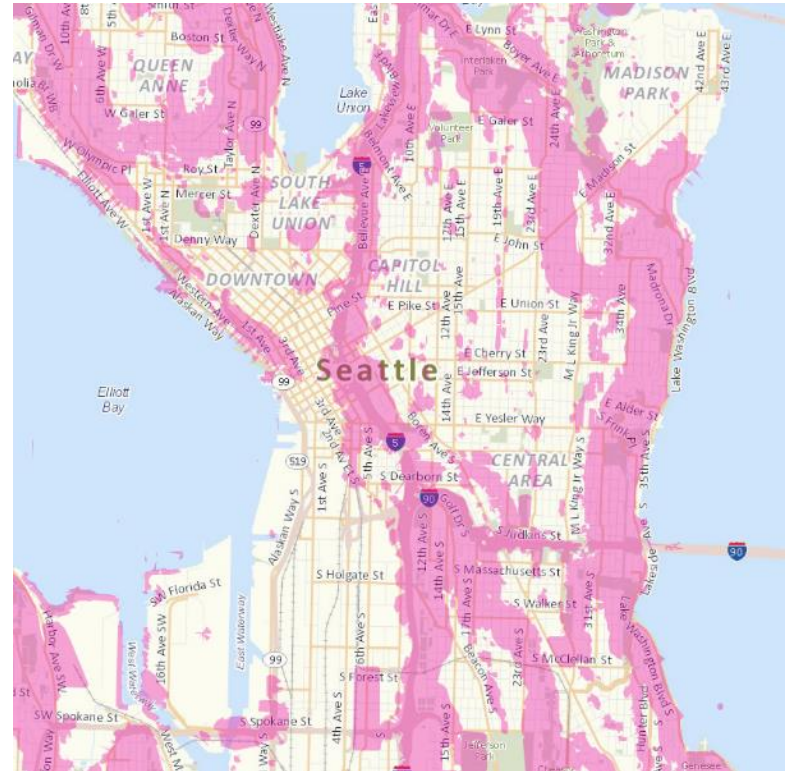
#3 Infiltration Feasibility/ Site Planning



- Questions to Consider:
 - What are the criteria that would deem a site infeasible for infiltration?
 - Will there be automatic exclusion areas?
 - What type of testing and documentation will applicants provide?
 - What's the preferred title for this requirement?

Infiltration Infeasibility Criteria Seattle Example

- Requires infiltrating BMPs when feasible
- City provides map to show where GSI is not required
- Establishes infeasibility process for applicants to demonstrate where LID is not feasible on a specific site
- Separate infeasibility criteria for most other BMPs



Infiltration Infeasibility Criteria

Seattle Example

1. Geotech deems infiltration infeasible due to a reasonable concern about erosion, slope failure or flooding.
2. Where the only area available for infiltration:
 - Would threaten the safety/reliability of any pre-existing utility, storage tanks, structure, road or parking lot surfaces/subgrades
 - Would not allow for a safe overflow pathway
 - Would threaten shoreline structures
 - Is within a designated Landslide-Prone Critical Area, Steep Slope Critical Area or within setback from Steep Slope Critical Area
 - Within numerous setback limitations (i.e. basements, buildings, drinking water wells, storage tanks, septic tanks, contaminated sites/landfills)
 - Within a drinking water protection area
 - Within seasonal high groundwater table limitations

Infiltration Infeasibility Criteria

Salem Example

1. Site Constraints Limiting GSI:

- Surface slopes cannot be graded to meet GSI Design Criteria
- Minimum facility dimensions cannot be met due to mandatory setbacks
- Downspout configuration cannot be reasonably modified to convey roof runoff to a facility
- Minimum vertical or horizontal clearance from utilities cannot be achieved
- Sensitive areas preclude the use of GSI
- GSI unreasonably restricts pedestrian, bicycle or vehicular access
- GSI is limited by historical preservation
- In conjunction with 1+ limiting factors, GSI cannot be reasonably incorporated into the landscaping requirements.

2. Financial Infeasibility Option

Infiltration Infeasibility Potential Criteria



- Slopes >15%
- High groundwater
- Drinking water protection areas
- Contaminated soils
- Setbacks from:
 - Drinking water wells
 - Utilities
 - Storage tanks
 - Septic tanks
 - Structures/basements
 - Steep slopes
 - Critical areas
 - Contaminated sites
- Geotech deems infiltration infeasible?
- Cannot provide a safe overflow path?
- Minimum infiltration rate – with or without safety factor?
- Site layout restrictions (Salem examples)
- Automatic exclusion areas?
- Testing and documentation?

#4 Water Quality

- Capture and treat 80% of the annual average runoff volume
 - 1.0 inch, 24-hour storm
 - Is this different in different areas of the county?
- List of approved facilities and uses (i.e. UIC Pretreatment)
- Documentation in drainage report and calculations

#5 Flow Control

- Infiltrate when feasible
- Flow-duration matching standard
- List of approved facilities with UIC notes
- Documentation in drainage report and calculations

#6 Downstream Analysis

- Minimum Requirement:
 - Downstream analysis required for all projects that connect to a public system or discharge to natural channel.
- What is the limit of the downstream analysis?
 - Specific distance for all sites ($\frac{1}{4}$ mile)
 - Distance when project site is $>10\%$ of the total contributing drainage area
- Is downstream analysis required for sites that use drywells or other infiltration systems?
- Will there be allowances/exceptions for areas with a Stormwater Master Plan or Regional Facility?



#6 Downstream Analysis

- Are applicants required to conduct a field investigation or can they rely on existing maps and reports?
- Are applicants required to provide capacity calculations or is the analysis limited to previously documented problems and field observations?
- What are the mitigation options when problems are revealed?
 - Onsite flow control
 - Upsize onsite flow control
 - Upsize offsite conveyance



#7 Conveyance and Natural Systems?

- Conveyance design guidelines currently limited to design storms and standard details
- What level of guidance should be included in the standards?
 - Maintain current level of information (design storms and standard details)
 - Add limited design information (outfalls, culverts)
 - Point to another resource (ODOT, Portland, CWS, etc.)
 - Add full design manual
- What level of documentation will WES review?

	Drainage area	Design Storm
Storm Sewers and Outfall Pipes	>10 Acres	10-year, 24-hour
	>640 Acres	25-year, 24-hour
	>640 Acres	50-year, 24-hour
Creek or Stream Channel	<250 Acres	25-year, 24-hour
	>250 Acres	50-year, 24-hour
	>640 Acres	100-year, 24-hour

#8 Natural Resource Protection



- Guiding Question:
 - Should the sensitive area/buffer requirements be outlined in the WES Rules or are they covered by County Code?

- Questions to Consider:
 - Are the current Natural Resource Protection Rules sufficient? What adjustments should be made?
 - What level of documentation/certification should be included in submittals?

Natural Resource Protection

Current WES Rules

Sensitive Area	Upstream Drainage Area	Slope Adjacent to Sensitive Area	Width of Undisturbed Buffer
Intermittent Creeks, Rivers, Streams	Less than 50 acres	Any slope	25 feet
	50 to 100 acres	<25%	25 feet
	50 to 100 acres	≥25%	50 feet
	Greater than 100 acres	<25%	50 feet
	Greater than 100 acres	≥25%	100 to 200 feet
Perennial Creeks, Rivers, Streams	Any upstream area	<25%	50 feet
	Any upstream area	≥25%	100 to 200 feet
Wetlands, lakes (natural), and springs	Any drainage	<25%	50 feet
	Any drainage	≥25%	100 to 200 feet

Natural Resource Protection

Current WES Rules

- Allowable activities in the buffer:
 - Road crossing to provide access to the sensitive area or across the sensitive area
 - Utility construction with restoration plan
 - Walkway or bike path for regional connectivity (8 feet max)
 - Pervious walkway or bike path that does not provide access to the sensitive area or across the sensitive area (8 feet max)
 - Measures to remove or abate hazards, nuisances, or fire and life safety violations
 - Erosion protection activities

#9 Operations and Maintenance



- Questions to consider:
 - Will WES allow private ownership of stormwater facilities that benefit:
 - Single owner (i.e. commercial/industrial)
 - Multiple owners (i.e. residential homeowners association)
 - Will WES maintain facilities accept maintenance responsibility for facilities that are located on private property?

#9 Operations and Maintenance Proposed Requirements



- All facilities require a recorded O&M Plan
- Privately Owned and Maintained
 - Facilities that benefit a single owner
 - Maintenance Covenant recorded with the land record
 - District may inspect and assess owners for costs of repair work
- Privately Owned and Publicly Maintained
 - Alternative:
 - Require transfer of ownership to the County
- Publicly Owned and Maintained
 - County facilities and regional facilities

Maintenance Covenant

- Gives access rights to the District
- Requires annual inspections by the owner
- Requires owners to keep records of repairs and maintenance

BREAK

Stormwater Facility Types and Use Guidelines

Questions to Consider



- Which BMPs will be included as “standard” use?
- Should certain facilities only be allowed as part of a modification or variance request?
- Which facilities should be used for
 - Infiltration Requirement
 - Water Quality Treatment
 - Flow Control
- What site conditions would limit the use of each facility?

Facility Selection and Use Guidelines

Infiltration Requirement

Water Quality Treatment

Flow Control

Public Street/ROW

Private Property

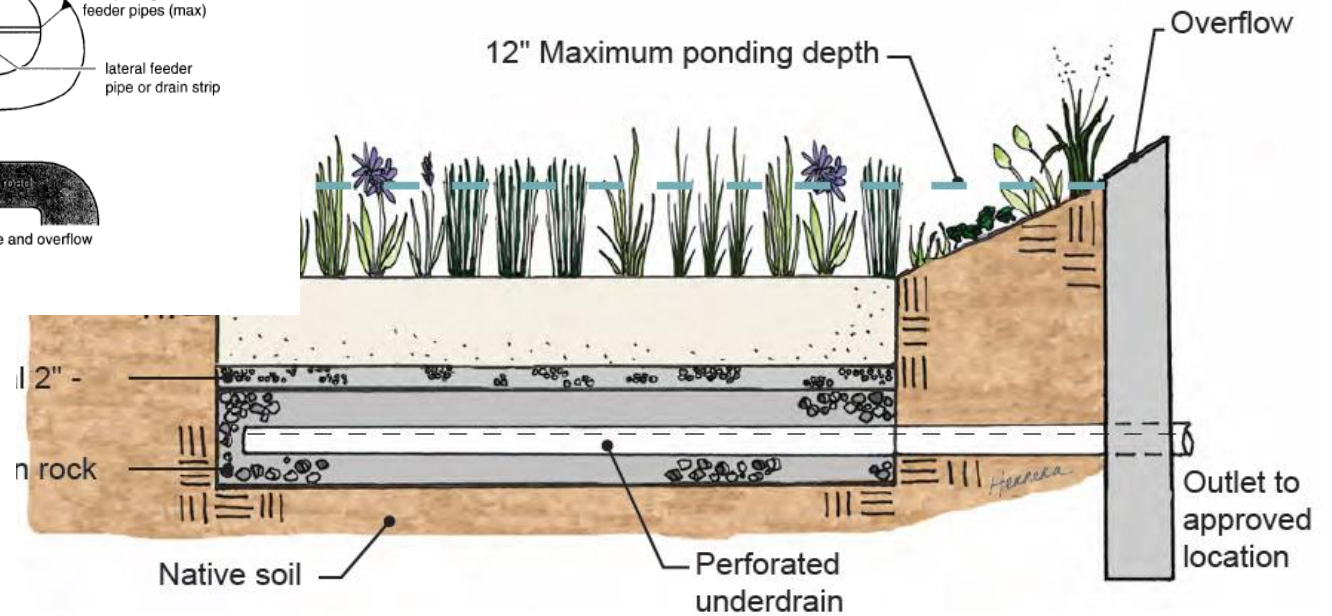
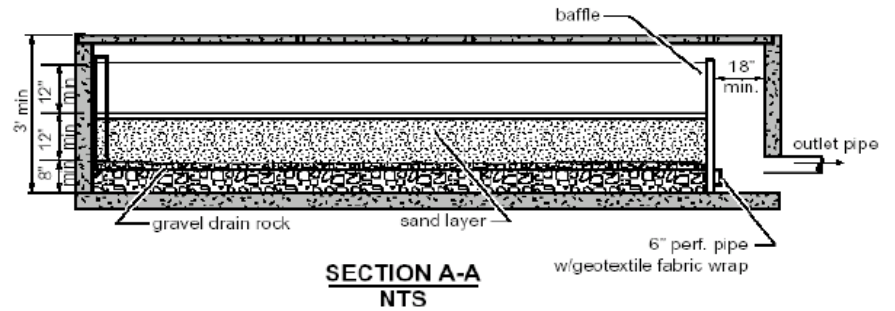
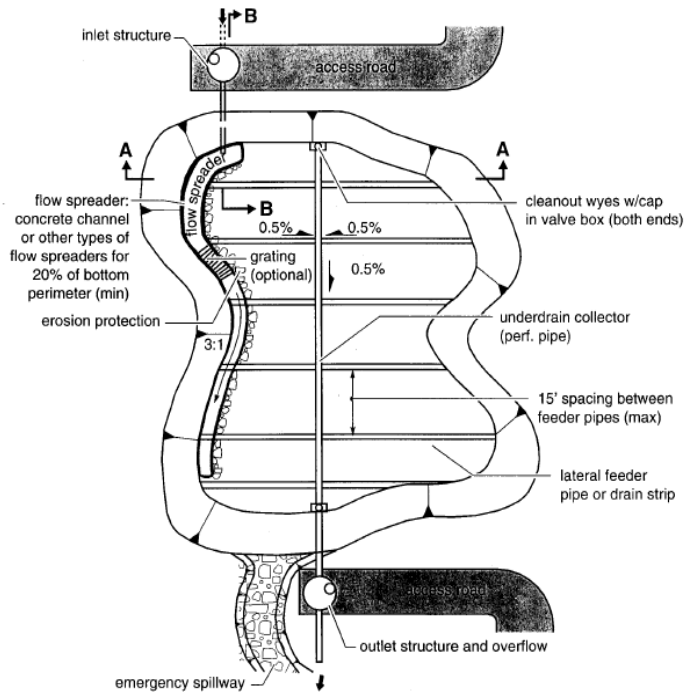
Steep Slopes

Design Notes

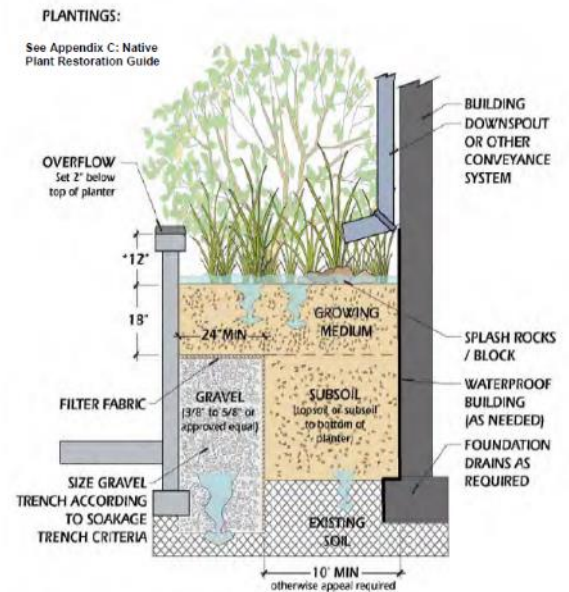
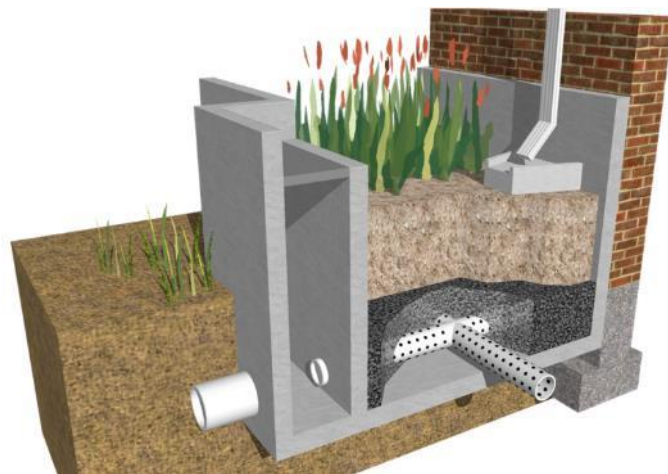
Maintenance Notes

Other

Sand Filter

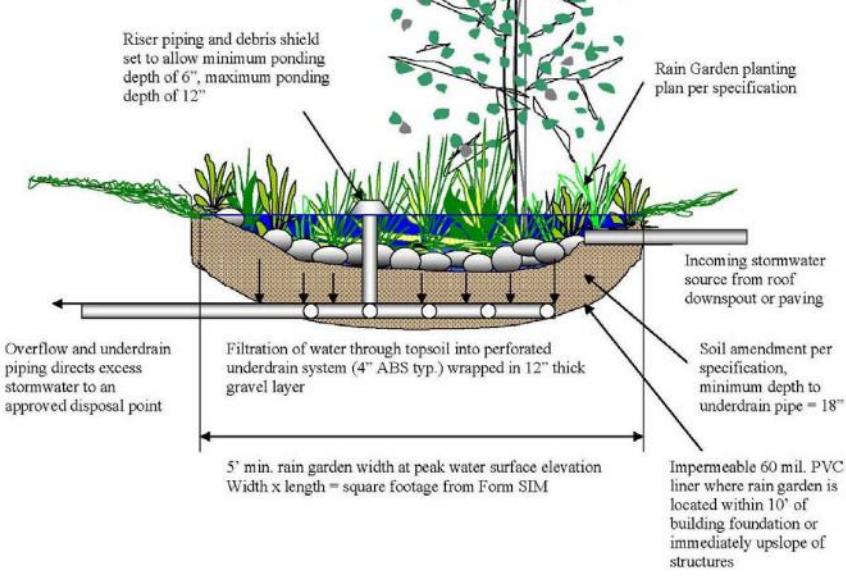
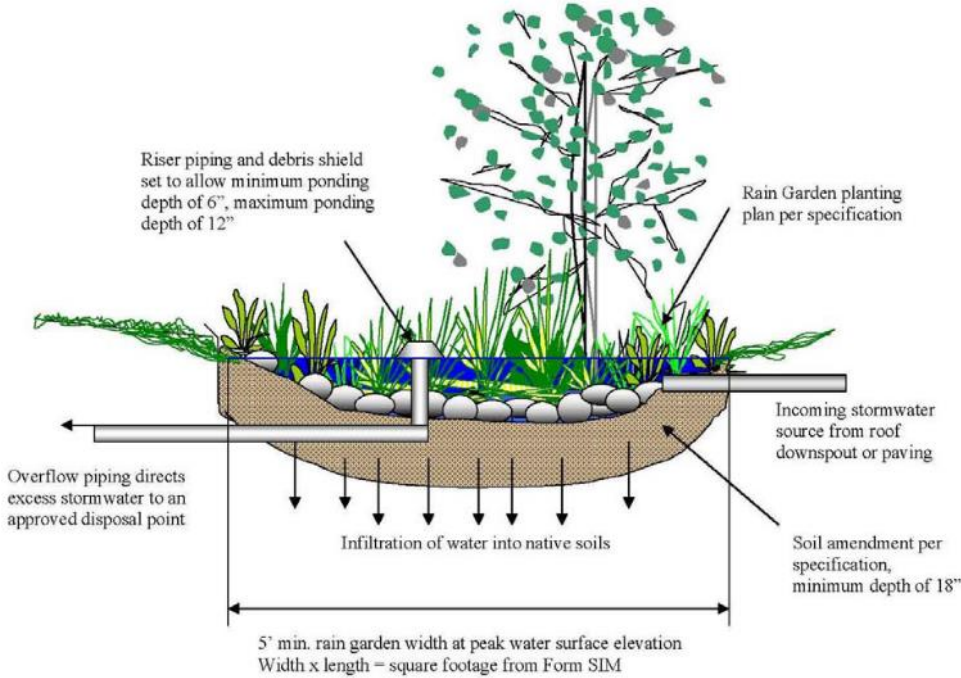


Stormwater Planter

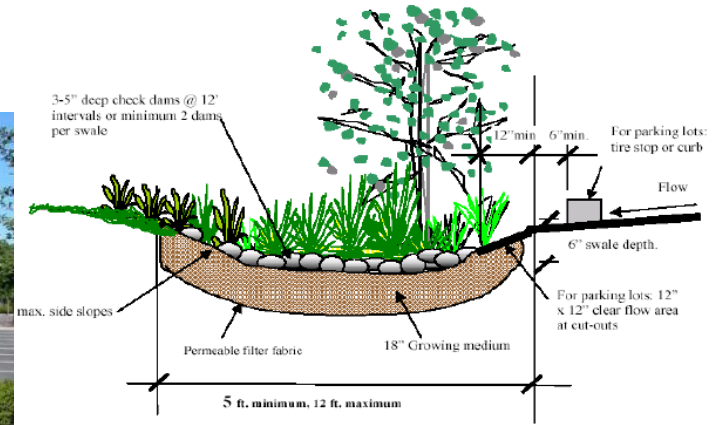
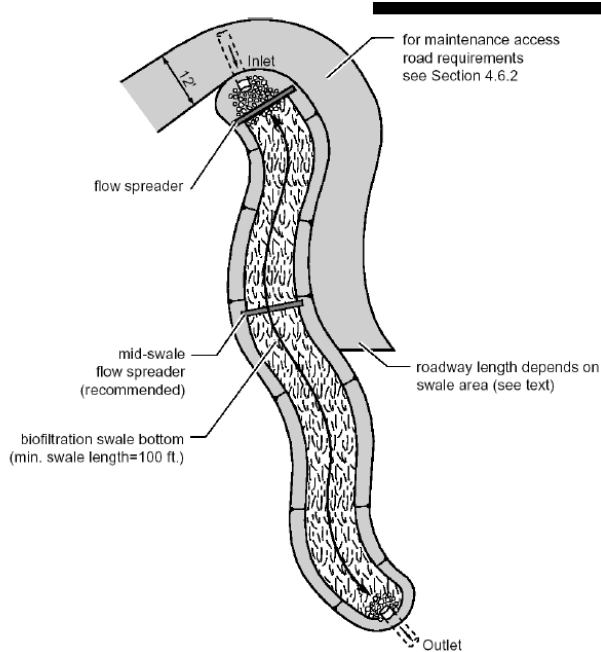


*Water reservoir depth may be reduced if planter surface area is increased.

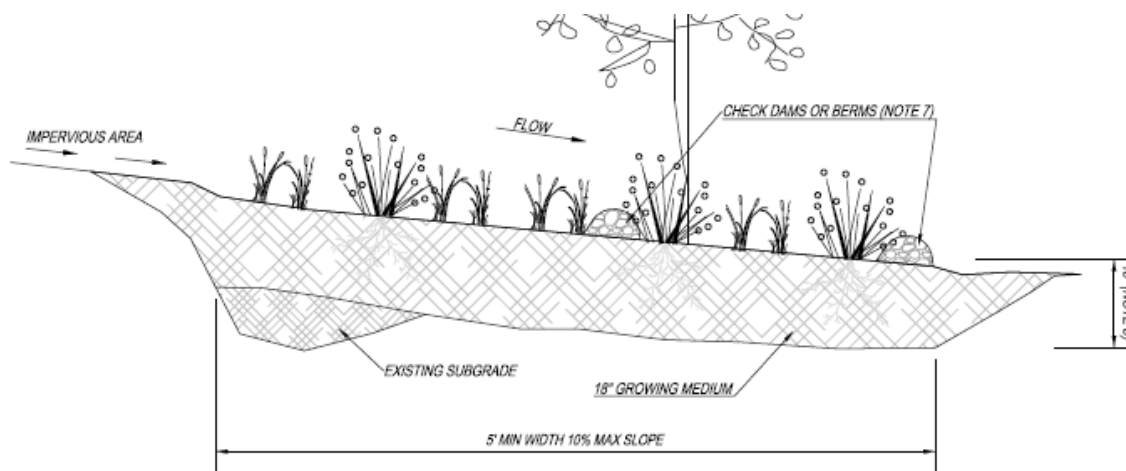
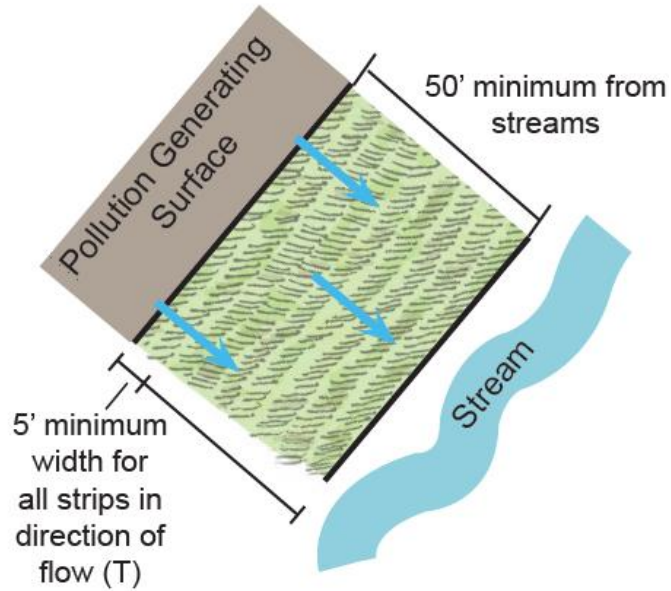
Rain Garden



Vegetated Swale



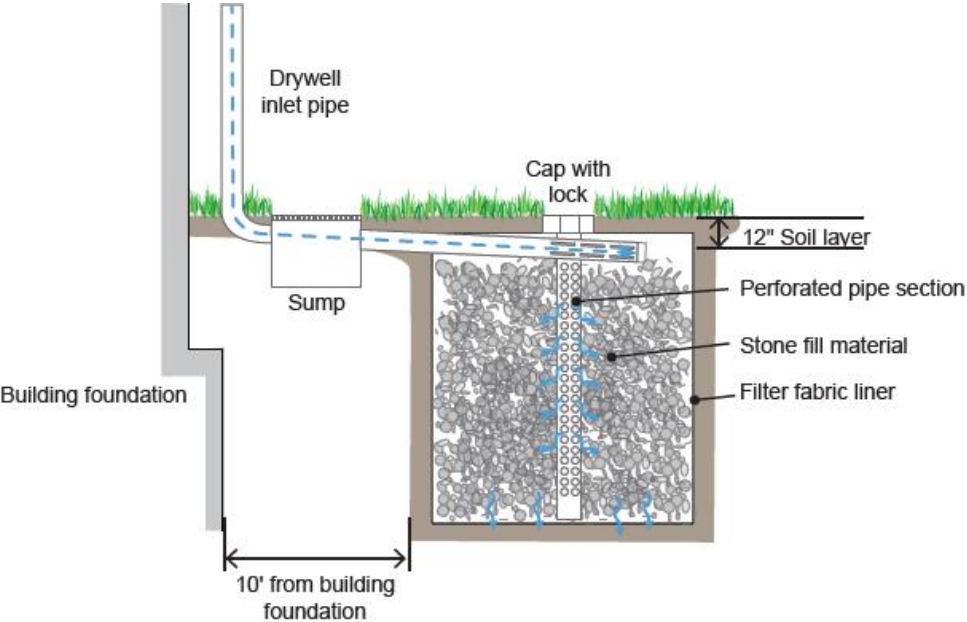
Filter Strip



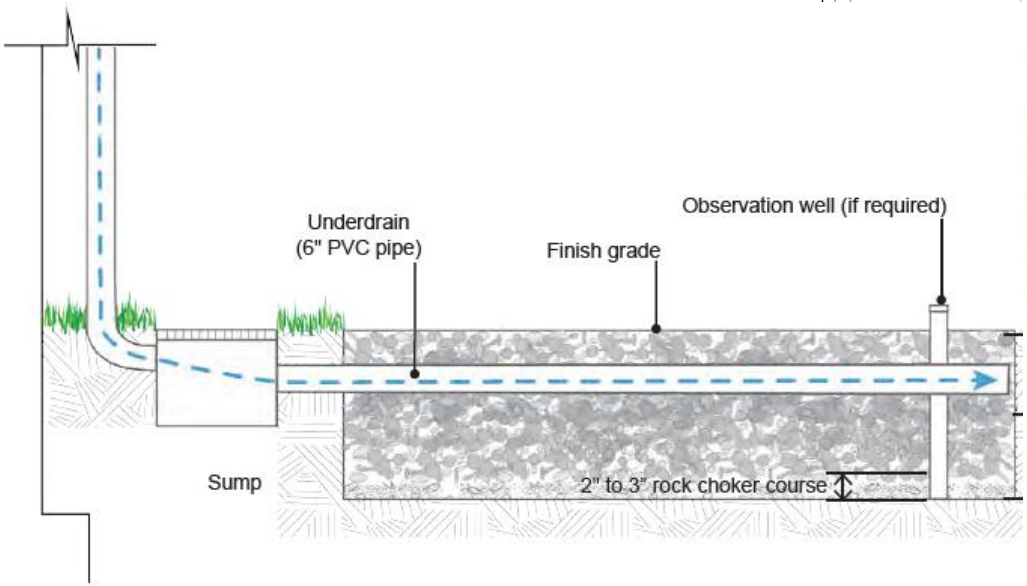
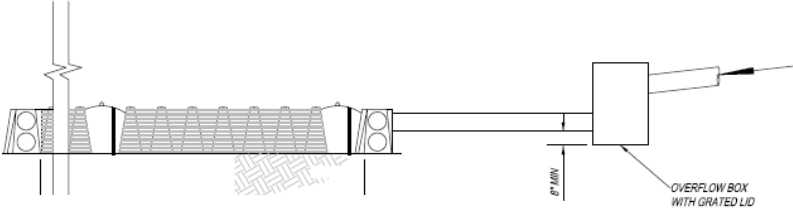
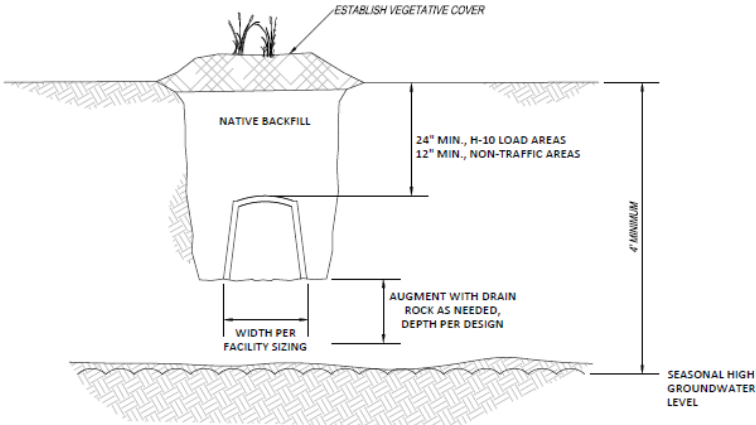
LENGTH OF IMPERVIOUS AREA FLOW PATH (30' MAX)

SLOPE OF FILTER STRIP	LENGTH OF IMPERVIOUS AREA FLOW PATH (30' MAX)			
	5'	10'	20'	30'
2%	5'	5'	5'	5'
5%	5'	5'	7'	9'
10%	5'	7'	10'	14'
15%	5'	9'	13'	16'

Drywell



Infiltration Trench



Infiltration trench also serving as an outdoor gathering space.

Constructed Wetland

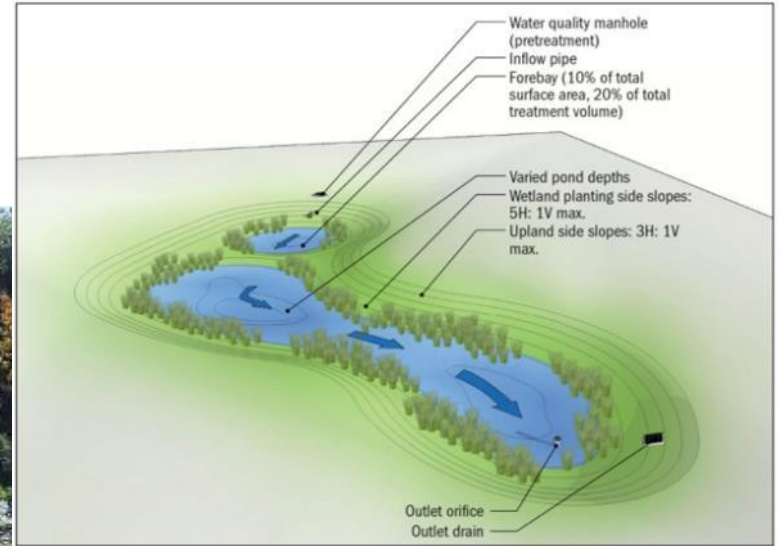
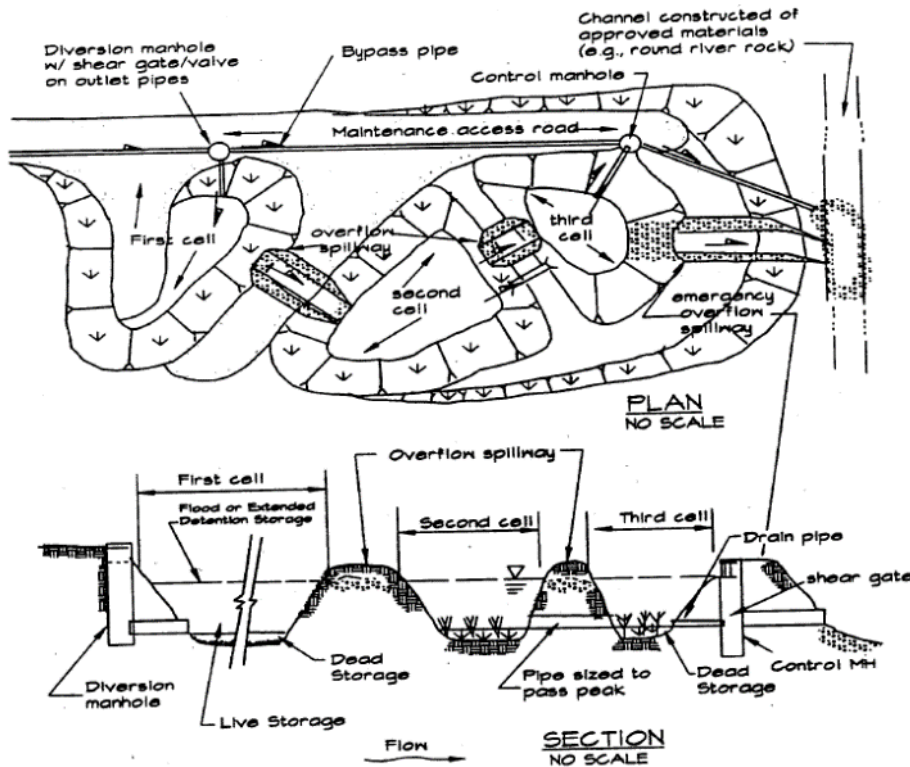


Image from Clean Water Services LIDA Handbook

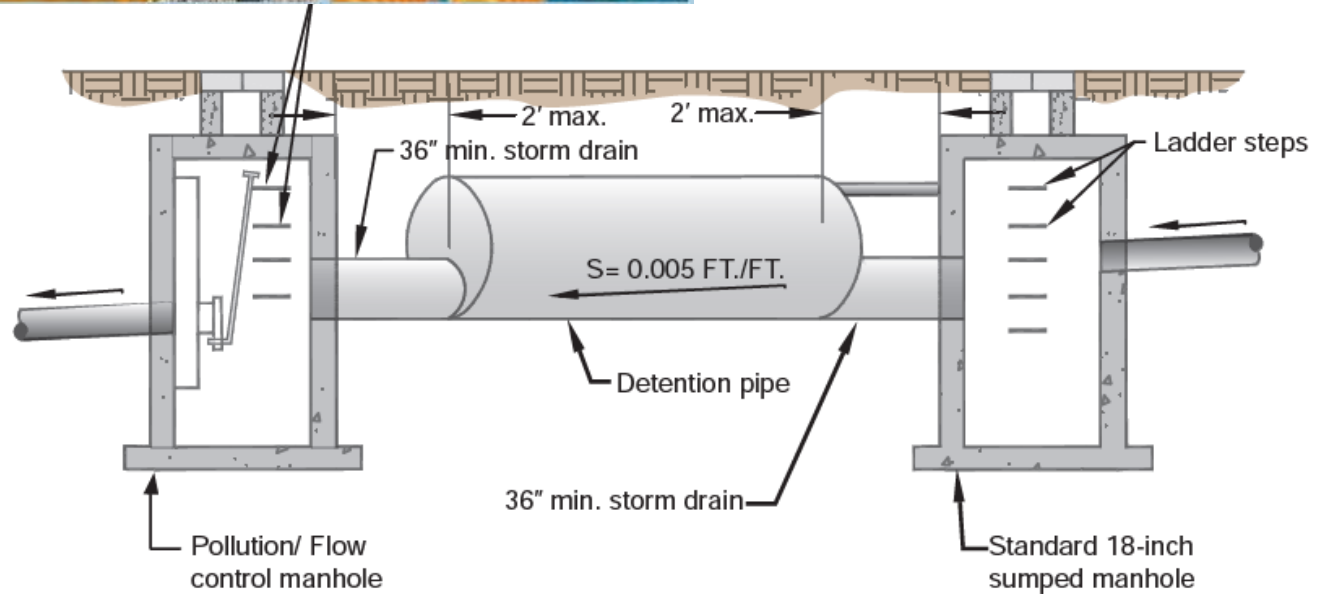


Washington County

Ponds – Detention, Infiltration, Wet



Structural Detention



Manufactured Treatment Technologies

- Option A: Identify a specific list of facilities that will be allowed
 - Portland and Gresham developed a list of approved systems in 2005
 - Salem allows 10 different systems, with a table of allowable uses
- Option B: Reference another jurisdiction's approved list (i.e. Department of Ecology, City of Portland)

Currently Approved List as of A		Portland Gresham
Approved for use in <u>Public Right-of-Way</u> (systems maintained by the City)	Approved for (systems	
1. Stormwater Management Stormfilter (vault-type w/multiple filter cartridges). Approved for stand-alone ¹ use at 15 gpm treatment flow per cartridge.	1. Stormwater Manag w/multiple filter cartridges). Approved for stand-alone ¹ use at 15 gpm treatment flow per cartridge.	
2. Stormwater Management Stormfilter (precast 48" manhole w/2 filter cartridges). Approved for stand-alone ¹ use at 15 gpm treatment flow per cartridge.	2. Stormwater Management Stormfilter (precast 48" or 60" manhole designs). Approved for stand-alone ¹ use at 15 gpm treatment flow per cartridge.	
3. Stormwater Management Stormfilter (precast 60" manhole w/3 filter cartridges). Approved for stand-alone ¹ use at 15 gpm treatment flow per cartridge.	3. Stormwater Management Stormfilter (catch basin model). Approved for stand-alone ¹ use at 15 gpm treatment flow per cartridge.	
4. CDS Technologies. Approved for pretreatment ² as a component of a treatment train.	4. CDS Technologies. Approved for pretreatment ² as a component of a treatment train.	
5. Downstream Defender. Approved for pretreatment ² as a component of a treatment train.	5. Downstream Defender. Approved for pretreatment ² as a component of a treatment train.	
6. Vortechincs Vortechs System. Approved for pretreatment ² as a component of a treatment train.	6. Vortechincs Vortechs System. Approved for pretreatment ² as a component of a treatment train.	
7. Stormceptor. Approved for pretreatment ² as a component of a treatment train.	7. Stormceptor. Approved for pretreatment ² as a component of a treatment train.	
	8. Jensen Precast Stormvault. Approved for pretreatment ² as a component of a treatment train.	

Sheet Flow Dispersion

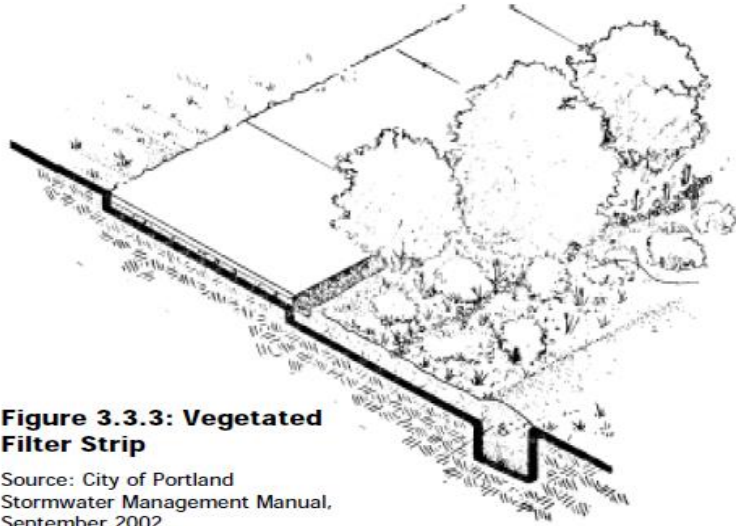
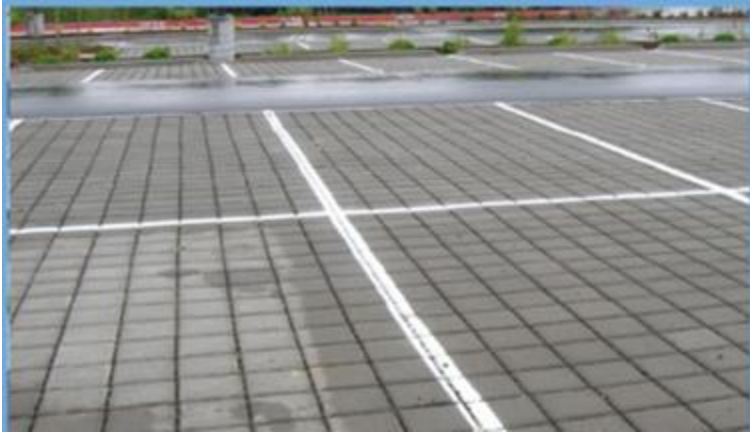


Figure 3.3.3: Vegetated Filter Strip

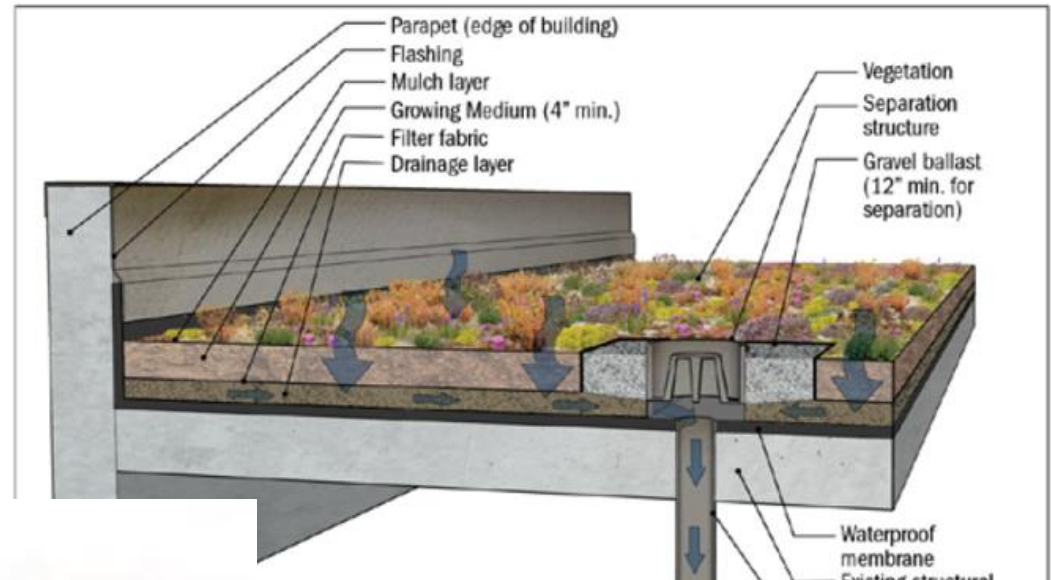
Source: City of Portland
Stormwater Management Manual,
September 2002



Pervious Pavement



Green Roof



Rainwater Harvesting



Photo provided by RainBank



Photo provided by RainBan



Wrap Up

Summarize Decisions



- Stormwater Minimum Requirements
 1. ESPC
 2. Source Control
 3. Infiltration Feasibility/Site Planning
 4. Water Quality Treatment
 5. Flow Control
 6. Downstream Analysis
 7. Conveyance?
 8. Natural Resource Protection?
 9. Operations and Maintenance
- Stormwater Facility Types and Use
- Follow-up Assignments
- Next Workshops

Additional Slides – For Reference

Allowable Facilities

	Portland	Salem	Oregon City	Lake Oswego	WES Draft
Stormwater Planter	X	X	X	X	X
Rain Garden	Basin	X	X	X	X
Vegetated Swale	X	X	X	X	X
Filter Strip	X	X	X	X	X
Drywell	X	Private Only	X	X	
Infiltration Trench	Soakage Trench	Private Only	X	X	SFR Roofs
Sand Filter	X			X	
Constructed Wetland		X		X	
Ponds		Parking Lot only	X	X	X
Structural Detention	X	X		X	
Manufactured Treatment	X	X	Private Only	Private Only	X
Sheet Flow Dispersion		X		X	
Pervious Pavement	X	X	X	X	X
Green Roof	X	X	X	X	X
Rainwater Harvesting				X	