



Stormwater Advisory Group Meeting #2

City Hall, Public Works Department, Traffic Control Conference Room

April 15, 2024



Agenda

1. Welcome (5 min)
2. Follow-up Questions Received (15 min)
3. Technical Infiltration Infeasibility Criteria (30 min)
 - a. Steep Slopes & Landslide Hazards
 - b. Contaminated & Fill Soils
 - c. Seasonal High Groundwater
 - d. Domestic Wells
 - e. Additional Facility Placement Restrictions
4. Stormwater Design Standards – Appendix 4A (Stormwater Submittal Requirements) (20 min)
5. Site Assessment & Planning Checklist (New) (20 min)



Common Acronyms

DEQ	Department of Environmental Quality
FC	Flow Control
GSI	Green Stormwater Infrastructure
LID	Low Impact Development
MEF	Maximum Extent Feasible
MS4	Municipal Separate Storm System
SF	Square Feet
SFR	Single-Family Residential
SRC	Salem Revised Code

1. Welcome

2. Follow-up Questions Received

Follow-up Questions - Summary

- Questions regarding exemptions, specifically direct discharge exemptions (to the Willamette River)
 - Staff are drafting flow control exemption language. A map will also be generated that establishes exemption areas for direct discharges to the Willamette.
- Questions regarding definitions, including:
 - Seasonal high groundwater and groundwater separation requirements
 - New/replaced impervious surfaces
 - Definitions are being updated by staff
- Increasing the growth media infiltration rate (currently 2 in/hr)
 - 2"/hr is intended to be a design (not measured) rate and consistent with the current standards. It reflects of a measured rate of 4" with a FOS of 2 (a new addition to the City's standards).

Follow-up Questions - Summary

- Updating the treatment design storm
 - Rainfall analyses conducted in 2010 used six local rain gages to validate the WQ design storm (1.38"/24 hrs), reflecting 80% of the average annual runoff. We are not planning to conduct a new rainfall analysis currently.
- Increasing the drawdown requirement
 - Staff have proposed increasing the drawdown time from 30 to 48 hours for infiltration and flow control facilities
- Clarify details/references for required freeboard or overflows
 - Staff are currently reviewing requirements and updating details
- Expand standards regarding access requirements for stormwater facilities, specifically around maintenance needs
 - Staff are currently reviewing maintenance requirements related to vector truck capabilities and will share the specific questions for incorporation

3. LID/ GI Strategy Review

LID/GI Strategy

- Use LID and GI strategies to minimize impervious area and reduce stormwater runoff
- LID/ GI Strategy (submitted November 2023)
 - Highlight site assessment requirements per Section 4.1(c)(3)
 - Continued prioritization of GSI

Low Impact Development

(Proposed City Definition from NPDES permit)

A stormwater management approach that seeks to mitigate the impacts of increased runoff and stormwater pollution using a set of planning, design and construction approaches and stormwater management practices that promote the use of natural systems, green infrastructure and other techniques for infiltration, filtration..... Low impact development is a comprehensive land planning and engineering design approach to stormwater management with a goal of mimicking the predevelopment hydrologic regime of urban and developing watersheds.

Green Stormwater Infrastructure

(Proposed City Definition)

A stormwater **management** facility that **uses vegetation, soils, or natural processes to promote** ~~mimics~~ natural surface hydrologic functions through infiltration or evapotranspiration, ~~or that involves stormwater reuse.~~ **Stormwater management facilities designed for full infiltration (no underdrain) or partial infiltration (with underdrain) of stormwater runoff are considered GSI.**

PROPOSED REVISIONS

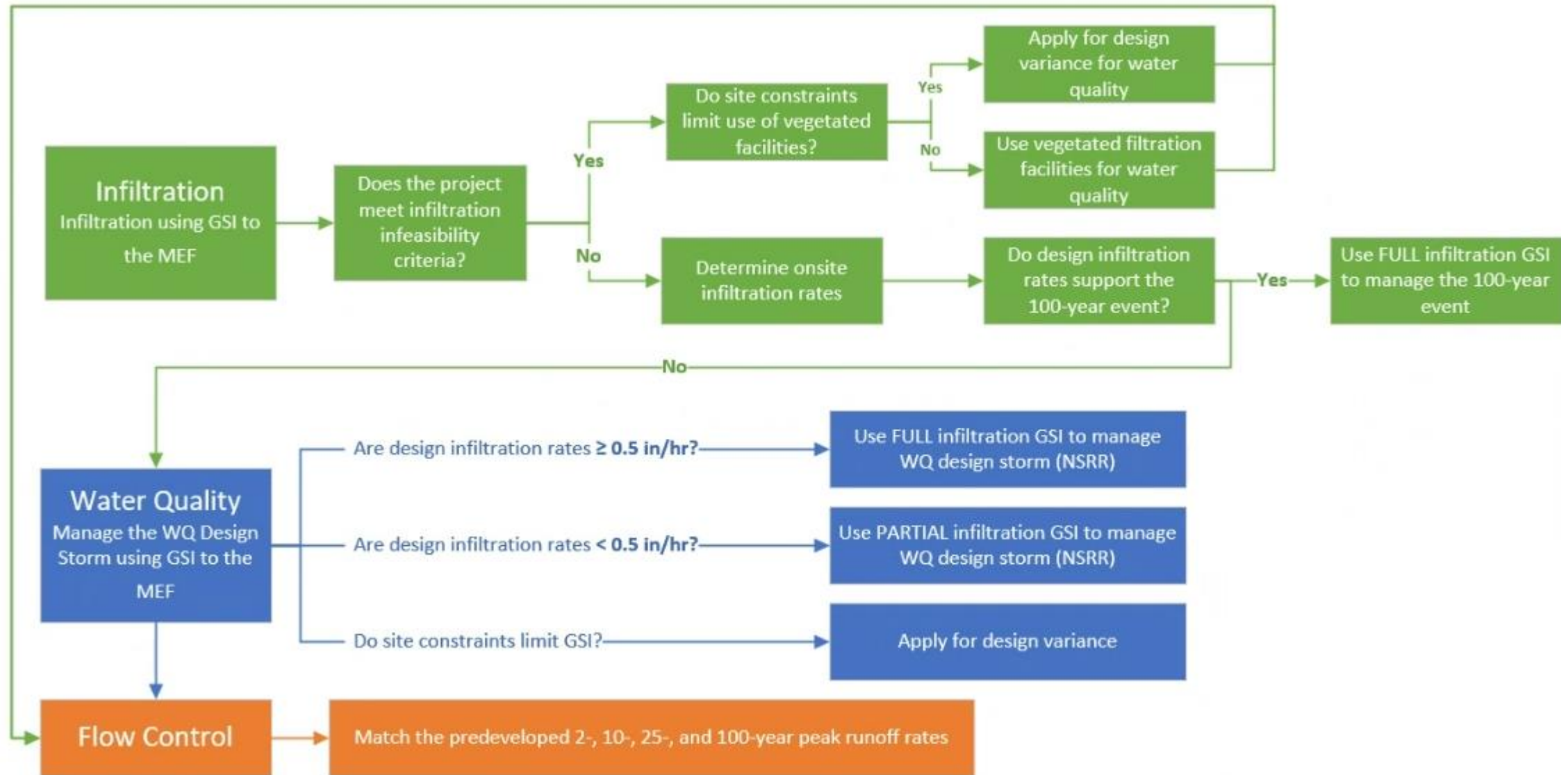
LID/ GI Strategy

- Updated Definitions
- Clarify Site Assessment Requirements (per Standards 4.2(c))
- Update infiltration guidelines
 - Design vs Measured
 - Use Factor of Safety (2) on measured rates
- Outline infiltration assumptions/ technical exemption criteria
- Development of Site Assessment Checklist (to aid in Land Use review)
 - Reference mapping and area information typically requested at land use
- Update stormwater facility application information to ensure GSI is prioritized.

Definitions

- **Infiltration Facility** – a stormwater management facility designed without a liner or underdrain to treat and fully infiltrate a design storm event.
- **Partial Infiltration Facility** – a stormwater management facility designed with an underdrain to treat and promote infiltration of a design storm event.
- **Filtration Facility** – a stormwater management facility designed to exclusively treat stormwater runoff by filtration through media. A filtration facility does not promote infiltration and may be lined.

Performance Standards



4. Technical Infiltration Infeasibility Criteria

- a. Steep Slopes & Landslide Hazards
- b. Contaminated & Fill Soils
- c. Seasonal High Groundwater
- d. Domestic Wells
- e. Facility Placement Limitations

Open Discussion

What are the primary challenges developers experience with use of infiltration facilities?

1. Availability or cost of Geotech Reports and infiltration testing?
2. Uncertainty in defining high seasonal groundwater levels?
3. Inconsistent infiltration rates across sites?
4. Understanding what facilities can be used for infiltration?
5. Challenges interpreting testing and/or design requirements?
6. Other?



Steep Slopes & Landslide Hazards

Proposed Infeasibility Criteria:

- Infiltration or partial infiltration facilities on slopes $\geq 25\%$ is prohibited
- Infiltration or partial infiltration facilities on sites with slopes $\geq 15\%$ or identified as Moderate/High landslide risk (Category B or C) pursuant to SRC Chapter 810 requires a Geotechnical Engineering/Geologist Report to determine the suitability and required setbacks for infiltration facilities.

Proposed Guideline:

- The greater of a 50' setback or 4H:1V upward projection from the toe of a 15% or greater slope to the proposed high-water point in the facility may be used in determining required setback from the top of slope.

Jurisdiction	Infiltration Infeasible
WES	Limited on slopes > 25%
City of Oregon City	Limited on slopes > 25%
City of Portland	Setbacks based on slope
City of Gresham	Prohibited on slopes > 20%
City of Eugene	Limited on slopes > 10%
City of Corvallis	Prohibited on slopes > 10%
Marion County	Prohibited on slopes > 25%

Seasonal High Groundwater

Proposed Infeasibility Criteria:

- Sites with less than 3-ft of vertical separation between the bottom of the facility and seasonal high ground water elevation.
- A Geotechnical Engineering or Geologist investigation and a report is required to determine the seasonally high groundwater level.

Jurisdiction	Minimum Distance Between Facility Bottom and SHGW
WES	3 feet
City of Oregon City	1 feet
City of Portland	5 feet
City of Gresham	3-5 feet
City of Eugene	6 feet
City of Corvallis	3 feet
Marion County	3 feet

Contaminated Soils

Proposed Infeasibility Criteria:

- Infiltration facilities are prohibited on sites with contaminated soils.
 - See Administrative Rule 109-012—Stormwater Source Control for an overview of contaminated soils.
- Potential resources for identifying contaminated sites include but are not limited to the following:
 - Leaking Underground Storage Tank database
 - Environmental Cleanup Site Information database
 - DEQ Facility Provider Map

Jurisdiction	Prohibited in Contaminated Soils
WES	X
City of Oregon City	X
City of Portland	X
City of Gresham	X
City of Eugene	--
City of Corvallis	X
Marion County	X

Fill Soils

Proposed Infeasibility Criteria:

- Infiltration facilities prohibited on fill soils deeper than 5-ft.
 - Measured from the highest finish grade adjacent to the proposed facility and the lowest existing grade under the proposed facility.
- An exception may be made if a stamped Geotechnical Report indicates suitable stability for an unlined facility.

Jurisdiction	Prohibited in Fill Soils
WES	X
City of Oregon City	X
City of Portland	Requires PE/GE stamp
City of Gresham	X
City of Eugene	--
City of Corvallis	X
Marion County	X

Domestic Wells

Proposed Infeasibility Criteria:

- Infiltration facilities prohibited within a 100-ft buffer around domestic wells to maintain consistency with Oregon Administrative Rules (OAR) protections for public wells.

Jurisdiction	Distance to Domestic Wells
WES	Limited within 2-year time of travel or 500-ft setback, whichever is greater
City of Oregon City	Drainage report must note wells within 250-ft of project boundaries
City of Portland	Prohibited with 2-year time of travel or 500-ft setback, whichever is greater; Limited in wellhead projection areas
City of Gresham	Prohibited with 2-year time of travel or 500-ft setback, whichever is greater; Limited in wellhead projection areas
City of Eugene	--
City of Corvallis	Prohibited within 100-ft buffer
Marion County	--

Facility Placement Limitations

Floodplain/Floodway

- Stormwater management facilities are prohibited within the identified floodway.
 - Floodway means the channel of a river or other watercourse and the adjacent land areas that must be reserved to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.
- Pervious pavement shall not be used in areas within the 100-year floodplain.

Other Limitations for Consideration

- Easements, wetlands, right-of-way, etc.

Jurisdiction	Prohibited/Limited in	
	Floodways/ Floodplains	Natural Resource Areas
WES	Limited	Limited
City of Oregon City	Limited	Limited
City of Portland	--	Limited
City of Gresham	Limited	--
City of Eugene	--	--
City of Corvallis	Prohibited	Limited
Marion County	--	Limited

5. Stormwater Design Standards – Appendix 4A (Stormwater Submittal Requirements)

Open Discussion

What challenges do developers experience with the Stormwater Submittal Requirements (Appendix 4A)?

- Understanding information required at land use?
- Preliminary review process?
- Site Conditions that end up limiting placement of stormwater facilities?



Appendix 4A: Stormwater Submittal Requirements

Contents:

4A.1 – Land Use Submittal Guide

- Land Use Development Tiers
- Preliminary Site Plan Requirements
- Preliminary Stormwater Management Report Requirements

4A.2 – Simplified Method Submittal Guide

- Updated Site Plan Requirements
- Cross Section and Details of the Proposed Facilities
- Infiltration Test Results
- Landscaping Plans
- Irrigation Plans
- Simplified Method Form
- Private Stormwater Facilities Agreement
- Operation and Maintenance Plan

4A.3 – Engineered Method Submittal Guide

- Simplified Method Submittal Guide
- Stormwater Management Report
 - Cover Sheet
 - Engineer's Certification and Statement
 - Project Overview and Description
 - Methodology
 - Analysis

4A.4 – GSI Analysis

~~4A.5 – Stormwater Facility Details/Exhibits~~

4A.6 – Source Control

4A.7 – Downstream Analysis Report

4A.8 – Open Channel Hydraulic Modeling

4A.9 – Floodway and Floodplain Analysis

Land Use Development Tiers (New)

Documents to be Submitted for Review	Tier 1	Tier 2	Tier 3	Tier 4
Preliminary Site Plan showing new/replaced impervious surfaces	X	X	X	X
Site Assessment and Planning Checklist		X	X	X
Simplified Sizing Form and Documentation		X		
Preliminary Stormwater Management Report			X	X

Tier 1 – Any project not required to provide flow control or WQ treatment (non-SFR with <5,000 SF of new or replaced impervious surfaces, or SFR on lots created prior to 2014).

Tier 2 – Any project using the Simplified Method (with total impervious surface between 1,300 and 10,000 SF). A licensed Engineer may or may not be involved with these projects.

Tier 3 – Any project using the Engineered Method (with total impervious surface >1,300 SF for SFR projects or 5,000 SF for Large Projects).

Tier 4 – Any project using the Engineered Method (with total impervious surface >1,300 SF for SFR projects and 5,000 SF for Large Projects) and does not meet all requirements listed in the PWDS and would require a Design Exception.

5. Site Assessment & Planning Checklist (New)

a. For Submittal at Land Use

Site Assessment & Planning Checklist

SITE ASSESSMENT AND PLANNING CHECKLIST			
✓ Information Needed	Attach Supporting Materials as needed		
Site Information			
Contact Information	Point of Contact:		
	Phone Number:		
	Email Address:		
Site Information	Site Address:		
	Site Area (acres/sq.ft):		
	Disturbance Area (acres/sq.ft):		
Proposed Stormwater Design Methodology (check one)	<input type="checkbox"/>	Simplified (applicable for sites < 10,000 ft ² new or replaced impervious surface) o For Simplified Method: Attach Simplified Sizing Form	
	<input type="checkbox"/>	Engineered (applicable for any site > 1,300 ft ² new or replaced impervious surface) o For Engineered Method: Attach Preliminary Stormwater Management Report	
	<input type="checkbox"/>	Area Set Aside (applicable for any site > 1,300 ft ² new or replaced impervious surface that has reserved an area of 20% of the impervious surface for future stormwater facilities) o For Area Set Aside: Attach Preliminary Site Plan showing area reserved	
Site Assessment and Design Considerations (Salem Administrative Rules, Division 004, Section XXX)			
Preliminary Site Plan and Utility Plan	Attach engineered scale Preliminary Site Plan or Preliminary Utility Plan per Section 4A.1. and ensure the following additional information below is included.		
Soils Research and include site hydrologic soil group	Identify NRCS Hydrologic Soil Type (show on Preliminary Site Plan if more than one type is present):	NRCS Soil Group:	
Groundwater	Attach Geotechnical Engineering or geologist investigation documenting seasonal high groundwater depth, if available.		
Hydrology – Conditions and Natural Features	Check if the following is present on site:		
	<input type="checkbox"/> Waterway (name):	<input type="checkbox"/> Sensitive natural areas(s) (list):	<input type="checkbox"/> Floodplain / Floodway
Minimize Site Disturbance	Delineate protection areas on Preliminary Site Plan for areas to remain undisturbed during construction.		

SITE ASSESSMENT AND PLANNING CHECKLIST	
Preserve Existing Vegetation	Existing trees and native vegetation must be preserved per unless approved for removal under SRC Chapter 808. Identify trees and native vegetation being retained on the Preliminary Site Plan.
Minimize Soil Compaction	Show temporary fencing around proposed green stormwater infrastructure (GSI) facilities and revegetation areas on the Preliminary Site Plan to minimize soil compaction and preserve existing soil permeability.
Impervious Area Accounting	Summarize proposed new and replaced impervious areas and any proposed impervious area reduction methods below. Reflect areas and locations on the Preliminary Site Plan.
	A. Total proposed new/replaced impervious area (sq. ft.):
	B. Area of proposed Green Roofs (sq. ft.):
	C. Area of proposed pervious pavements (sq. ft.): Describe type of pavers or pavement proposed
	D. Impervious area requiring stormwater treatment [A-(B+C)] (sq. ft.):
E. Impervious area requiring flow control [A-(C)] (sq. ft.):	
Infiltration Feasibility	
Infeasibility Criteria	Use of infiltration or partial infiltration facilities (i.e., GSI) may be limited by the following site conditions (include documentation to demonstrate the limiting condition). Select any applicable site conditions:
	<input type="checkbox"/> Steep slopes (≥ 25%) <input type="checkbox"/> High seasonal groundwater (less than 3 feet below ground surface) <input type="checkbox"/> Fill Soils <input type="checkbox"/> Contaminated soils <input type="checkbox"/> Within a 100-foot buffer of a domestic well <input type="checkbox"/> Other as proposed in a design exception pursuant to Admin Rule XXXX <input type="checkbox"/> N/A
Infiltration Capacity Determine soil capacity for onsite infiltration. If the design infiltration rate is 0.5"/hr minimum, infiltration of the water quality design storm is required using GSI.	If an infiltration test is performed, attach the documentation. See Appendix 4D for the approved infiltration testing methods.
	Test type (check one): <input type="checkbox"/> Basic Method <input type="checkbox"/> Professional Method
	Measured Infiltration Rate (inches/hour):
	Design Infiltration Rate (inches/hour): (Design infiltration rate reflects application of a factor of safety of 2.0 on the measured infiltration rate)
	Is full onsite retention/infiltration up to the 100-year storm event proposed? (applicable for design infiltration rates > 2.0 in/hr)? <input type="checkbox"/> Yes <input type="checkbox"/> No
	For Simplified Method only: If infiltration testing was not conducted, identify the preliminary design infiltration rate based on NRCS Hydrologic Soil Group.
NRCS HSG:	
Design Infiltration Rate (inches/hour):	

Upcoming Meetings

- Definitions
- Design Standards Reorganization
 - Inclusion of Exemptions (from SRC)
 - Design Methods
 - Inclusion of Checklists
- Simplified Method Sizing
- Stormwater Facilities
 - Design Criteria
 - Applications
 - Hierarchy

Thank you.

Any questions?

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