DPD	Director's Rule 19-2009
SPU	Director's Rule 2009-007

Applicant: Dept. of Planning & Development (DPD) Seattle Public Utilities (SPU)	**Page** 1 of 21	**Supersedes:** NA
	Publication:	**Effective:**
Subject: Requirements for Green Stormwater Infrastructure to the Maximum Extent Feasible	**Code and Section Reference:** SMC 22.800-22.808	
Index: Title 22.800 – 22.808 Stormwater Code	**Type of Rule:** Code Interpretation	
	Ordinance Authority: SMC 3.06.040 and SMC 3.32.020	
	Approved **Date** Ray Hoffman, Acting Director, Seattle Public Utilities	
	Approved **Date** Diane M. Sugimura, Director, Planning & Development	

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Introduction

The purpose of this Director's Rule is to state the City's interpretation of green stormwater infrastructure (GSI) to the "maximum extent feasible" and define steps for evaluating and reporting on this requirement. According to Seattle Municipal Code (SMC) 22.805.020.F, the following types of projects are required to implement GSI to the maximum extent feasible (MEF):

- Any single family residential (SFR) projects,
- Any project with 7,000 square feet or more of land-disturbing activity, and
- Any project with 2,000 square feet or more of new plus replaced impervious surface.

Projects must implement GSI to infiltrate, disperse, and retain drainage water onsite to the MEF without causing flooding, landslide, or erosion impacts.

In addition to the complying with this Director's Rule, projects must comply with standards and requirements for GSI presented in the Seattle Stormwater Code (SMC 22.800-.808) and Stormwater Manual (Director's Rules 15-2009 through 18-2009). More detailed design information on GSI is available in Chapter 4 of Director's Rule 17-2009 (Stormwater Manual Volume 3). The provisions of this rule are adopted after considering the best available science set out in Clerk's File 310134.

Rule

The City of Seattle interprets the requirement for implementing GSI to the MEF as follows:

- For single family residential projects only, the GSI target is that all but 1,500 sf of new plus replaced impervious surface must be mitigated using GSI, limited only by feasibility based on practical considerations of engineering design, physical limitations of the site, and reasonable considerations of financial costs.

- For all other projects requiring GSI to the MEF, the GSI target is to mitigate 100% of new plus replaced impervious surface using GSI, limited only by feasibility based on practical considerations of engineering design, physical limitations of the site, and reasonable considerations of financial costs.

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Projects that also have a minimum requirement for flow control pursuant to the Stormwater Code expressed as a numerical flow control performance standard, shall also demonstrate compliance with that standard, as set forth in the Stormwater Code and Director's Rule 17-2009 (Stormwater Manual Volume 3)[1].

The applicant must evaluate, select and calculate sizing for GSI best management practices (BMPs) to achieve MEF and must comply with this rule. The applicant is encouraged to evaluate, select and calculate sizing for GSI BMPs for all categories and in the order listed in Table 1. The applicant is solely responsible for selecting, designing and constructing GSI BMPs that are appropriate to the project, considering all potential impacts on and off the site.

Table 1. Green Stormwater Infrastructure Evaluation Category Prioritization

GSI Evaluation Category		GSI BMPs	Stormwater Manual Vol. 3 Section
No.	Name		
1	Green Stormwater Infrastructure – Runoff reduction methods	Maintain Existing Trees	4.4.2
		Dispersion (downspout or sheet flow)	4.4.3 / 4.4.4
		Plant New Trees	4.4.2
2	Green Stormwater Infrastructure – Infiltrating and reuse facilities	Bioretention Cells (without underdrain)	4.4.5
		Rainwater Harvesting	4.4.6
		Permeable Pavement Facilities (with storage reservoir and overflow)	4.4.7
3	Green Stormwater Infrastructure – Impervious surface reduction methods	Green Roof	4.4.8
		Permeable Pavement Surfaces	4.4.7
		Bioretention Cells (with detention)	4.4.5
4	Green Stormwater Infrastructure – Non infiltrating facilities	Bioretention Cells (with underdrain)	4.4.5
		Detention Cisterns, aboveground with harvesting capacity [a]	4.6.6

[a] Detention cisterns with harvesting capacity are considered green stormwater infrastructure for single family residential projects only.

[1] Note that sizing of GSI facilities set forth in Table A.1 of this Director's Rule differs from GSI sizing used to meet the minimum requirements for flow control pursuant to the Stormwater Code (including but not limited to Stormwater Manual Vol. 3, Sections 2.3-2.6). While sizing for flow control compliance varies depending on a given site's flow control standard, Table A.1 has been simplified to one version for consistent Citywide application of the "maximum extent feasible" requirement.

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GSI Evaluation and Reporting

For projects required to install GSI to the MEF, the applicant shall provide, at a minimum, the following with the project application for drainage review and approval:

1. A completed Green Stormwater Infrastructure Requirements Worksheet (Table A.1, Appendix A).

2. If the GSI requirement is not achieved per Appendix A, then additional submittal documentation regarding feasibility are required as set forth in this Director's Rule. This documentation must provide substantial evidence sufficient to explain and justify the applicant's conclusion that including additional GSI in the project design is not feasible. Additionally, a statement by the applicant certifying that the project design implements GSI to the maximum extent feasible shall be submitted.

Evaluating Feasibility: Engineering Limitations

Engineering design conditions may limit the type and amount of GSI that can be implemented for a project. The Stormwater Manual Volume 3, Sections 4.3 and 4.4 include examples of engineering limitations to the implementation of GSI. Limitations on the use of GSI are based on the need to protect private and public property,2 protect infrastructure and achieve facility effectiveness.

If the applicant determines that including additional GSI in the project design is not feasible due to practical engineering design limitations, then the applicant must provide additional submittal documentation:

1. At minimum, a narrative description and rationale with substantial evidence sufficient to explain and justify the applicant's conclusion; and

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[2] Projects in the right-of-way will require compliance with Chapter 6.4 of the Right-of-Way Improvement Manual (www.seattle.gov/transportation/rowmanual/), to the extent the manual does not conflict with City ordinance or regulation.

2. A completed Engineering Design Feasibility Checklist (Appendix B[3]), including description of the technical limitations used to determine the limits of proposed mitigation to meet MEF.

Evaluating Feasibility: Physical Limitations of the Site

Urban environments have multiple demands on space. The City requires that the applicant consider these physical site limitations when designing GSI to the maximum extent feasible. Examples of physical site limitations that may restrict use of GSI include, but are not limited to, historical designation, vehicular and pedestrian access, utility conflicts, intended public use of the right of way, and usable open space requirements.

If the applicant determines that including additional GSI in the project design is not feasible due to physical site limitations, then the applicant must provide additional submittal documentation:

1. At minimum, a narrative description and rationale with substantial evidence sufficient to explain and justify the applicant's conclusion.

Evaluating Feasibility: Financial Costs

If the applicant determines that including additional GSI in the project design is not economically feasible using reasonable consideration of financial costs, even when engineering design limitations and physical limitations of the site would allow greater GSI use, then the applicant must provide additional submittal documentation:

1. A detailed cost estimate of constructing the project as proposed;

2. A detailed cost estimate of constructing the proposed GSI;

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[3] Appendix B of this Director's Rule summarizes engineering limitations from Stormwater Manual Vol. 3 that may limit applicability of each GSI BMP on a site. Refer to the appropriate sections in the Stormwater Manual Vol. 3 for more detail on site considerations and for the design requirements for GSI. All sizing provided in this DR and Stormwater Manual Vol. 3 assumes that an overflow conveyance system is included in the design.

Note: When quantifying the costs for substituting a GSI material for a traditional material, report the difference in cost between the conventional and GSI approach (e.g., the difference in cost between permeable concrete relative to standard concrete).

3. A detailed cost estimate of constructing GSI based on what is feasible given practical engineering design limitations and physical limitations of the site, versus what is proposed; and

4. At minimum, a narrative description and rationale with substantial evidence sufficient to explain and justify the applicant's conclusions that the proposed GSI mitigation is GSI to the maximum extent feasible and that additional GSI is economically infeasible.

Definitions

Theses definitions and others are contained Chapter 22.801 of the Stormwater Code:

"Green stormwater infrastructure" means a drainage control facility that uses infiltration, evapotranspiration, or stormwater reuse. Examples of green stormwater infrastructure include permeable pavement, bioretention facilities, and green roofs.

"Maximum extent feasible" means the requirement is to be fully implemented, constrained only by the physical limitations of the site, practical considerations of engineering design, and reasonable considerations of financial costs and environmental impacts.

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APPENDIX A: Documenting Green Stormwater Infrastructure to the Maximum Extent Feasible

The GSI Requirement Worksheet is presented as Table A.1. The applicant shall follow the steps presented below. If a project is a joint project, a worksheet shall be submitted for each parcel portion of the project and the roadway portion of the project. Note that GSI facilities must meet the considerations and requirements set forth in Stormwater Manual Vol. 3 (DR 17-2009). If the project is in the right-of-way, the Street Use Permit process will require compliance with design requirements in Chapter 6.4 of the Right-of-Way Improvement Manual (www.seattle.gov/transportation/rowmanual/), to the extent the manual does not conflict with City ordinance or regulation.

Step A – Review the GSI Requirement Worksheet (Table A.1) to identify initial BMP options for the project site. (Note that the spreadsheet version is available on the DPD website).

Step B – Divide the project area into distinct project types (e.g., sidewalk[4], trail, roadway, single family residential, parcel).

Step C – Calculate and report total new plus replaced impervious surface.

Step D – Check the feasibility of infiltration, see Figure 4.2.

Step E – Identify opportunities and available space for GSI Category 1 "GSI Runoff Reduction Methods" (retaining trees, planting new trees and dispersion).

Determine GSI credits for selected BMPs (Table A.2).

For each BMP, calculate and report the impervious area mitigated as a product of the BMP area and its GSI credit.

Step F – Identify opportunities and available space for GSI Category 2 "Infiltrating and reuse facilities" (bioretention cells, permeable pavement facilities and rainwater harvesting).

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4 "Sidewalk" project" means a project that exclusively involves the creation of a new or replacement of an existing sidewalk, including any associated planting strip, curb, or gutter.' Note: To provide clarity on the meaning of associated curb or gutter, a project involving a sidewalk with associated curb or gutter is considered a sidewalk project, only if all of the following apply: (1) Any new and replaced impervious surface in the roadway is specifically required as a component of the sidewalk project. That is, the sidewalk project cannot be completed without the associated work in the roadway; (2) The total amount of new plus replaced impervious surface in the roadway does not exceed 10,000 square feet in a drainage basin; and (3) The total amount of new plus replaced pollution-generating impervious surface does not exceed 5,000 square feet in a designated storm drainage basin.

Determine sizing factors for selected bioretention and permeable pavement facilities (Table A.3). For parcels using rainwater harvesting, applicant must provide calculations to document area mitigated by the rainwater harvesting strategy.

For each BMP, calculate and report the impervious area mitigated using the sizing factor or reuse analysis.

Step G – If there are remaining unmitigated impervious surfaces, identify opportunities and available space for GSI category 3, "Impervious surface reduction methods" (green roofs and permeable pavement surfaces) followed by GSI Category 4 "non-infiltrating green stormwater infrastructure" (bioretention planter with underdrain, and detention cisterns with harvesting capacity). Note that detention cisterns are only considered GSI for SFR projects.

Determine GSI credits (Table A.4) and/or sizing factors (Table A.5) for selected BMPs.

For each, BMP, calculate and report the impervious area mitigated using the GSI credits or sizing factors.

Step H – Calculate and report the total impervious area mitigated by summing the area mitigated.

Step I – If desired, consider innovation by evaluating emerging GSI facilities approved by the Washington State Department of Ecology. Any conditions of use for approved facilities within City of Seattle will be listed at www.seattle.gov/util/greeninfrastructure.

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Table A.1. Green Stormwater Infrastructure Requirement Worksheet

City of Seattle Green Stormwater Infrastructure Requirement Calculator (11-25-09)

Project Type →	
Project Area →	sf
New plus Replaced Impervious Area →	sf
Area Requiring Mitigation → (1,500 sf credit for SFR projects)	sf

Runoff Reduction Methods			Facility Size				Credit		Area
Retained Trees									
Existing Evergreen	# Trees		Total Canopy Area of Trees		sf	x	20% (or min 100 sf/tree)	=	sf
Existing Deciduous	# Trees		Total Canopy Area of Trees		sf	x	10% (or min 50 sf/tree)	=	sf
New Trees									
New Evergreen			# Trees			x	50 sf	=	sf
New Deciduous			# Trees			x	20 sf	=	sf
Dispersion [1]									
Downspout or Sheet Flow Dispersion			Dispersed Impervious Area		sf	x	86.0%	=	sf

Infiltrating and Reuse Facilities			Facility Size				Sizing Factor		Area
Infiltrating Facilities									
Bioretention Cell (without Underdrain)									
Ponding Depth		in	Bioretention Bottom Area		sf	÷	Select Depth	=	sf
Design Infiltration		in/hr							
Permeable Pavement Facility (may receive run-on)									
Ponding Depth [2]		in	Permeable Pavement Area		sf	÷	Select Depth	=	sf
Design Infiltration		in/hr							
Reuse Facilities [1]									
Rainwater Harvesting			Applicant must provide documentation of						sf

Impervious Surface Reduction Methods	Facility Size				Credit		Area
Alternative Pavement Surfaces							
Permeable Pavement Surface (Subgrade Slope ≤ 2%)	Permeable Pavement Area		sf	x	100.0%	=	sf
Permeable Pavement Surface (Subgrade Slope 2-5%)	Permeable Pavement Area		sf	x	60.0%	=	sf
Alternative Roof Surfaces [1]							
Green Roof (Single-Course / 4" Growth Medium)	Green Roof Area		sf	x	59.0%	=	sf
Green Roof (Multi-Course / 4" Growth Medium)	Green Roof Area		sf	x	59.0%	=	sf
Green Roof (Multi-Course / 8" Growth Medium)	Green Roof Area		sf	x	70.0%	=	sf

Non-Infiltrating Facilities			Facility Size				Sizing Factor/Credit		Area
Non Infiltrating Facilities									
Bioretention Planter (with underdrain)									
Ponding Depth		in	Bioretention Bottom Area		sf	÷	Select Depth	=	sf
Bioretention Cell with Detention [1] (without Underdrain)									
Contributing Area		sf							
Ponding Depth		in	Bioretention Bottom Area		sf		Select Depth	=	sf
Design Infiltration		in/hr							
Detention Cistern with Harvesting Capacity [3]									
Contributing Area		sf	Min Cistern Area		sf			=	sf
			Min Live Cistern Volume		gal				

Total Area Mitigated →	0 sf
Area Requiring Mitigation →	sf
% Impervious Area Mitigated →	%
GSI Requirement Achieved? →	

Notes:

GSI - Green Stormwater Infrastructure; sf - square feet; in - inch; NA - not applicable; eqn - equation
min - minimum; ft - feet; in/hr - inch per hour; gal - gallons

1. Single family residential projects are not required to evaluate this BMP.
2. Average subsurface ponding depth in aggregate storage reservoir.
3. Cistern area must be rounded up to next commercially available product. Cistern need not have more than 3 feet of live storage volume above orifice.

This calculator does not provide conveyance flow calculations.
Applicant is responsible to ensure system overflow conveyance is provided per Section 4.2.5 of the Stormwater Manual Volume 3.

Herrera Environmental Consultants

Table A.2. GSI Credits for GSI Evaluation Category 1: Runoff Reduction Methods

BMP	Design Variable	GSI Credit [a] (%)	Volume 3 Section providing Design Requirements
Retained Tree [b]	Evergreen	20% canopy area (min 100 sf)	4.4.2
	Deciduous	10% canopy area (min 50 sf)	
New Tree [b]	Evergreen	50 sf / tree	4.4.2
	Deciduous	20 sf / tree	
Dispersion	Dispersion to compost amended lawn or landscape	86%	4.4.3 and 4.4.4

sf - square feet; % - percent

[a] Impervious area mitigated by a BMP is calculated as: [GSI Credit (%)/100] x [Existing Tree Canopy Area, Number New Trees Planted, or Impervious Area Dispersed].

[b] Trees must be within 20 feet of ground-level impervious surface. The total tree credit shall not exceed 25 percent of impervious surface requiring mitigation.

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Table A.3. Sizing Factors for GSI Evaluation Category 2: Infiltrating and Reuse Facilities

BMP	Facility Overflow Depth	Native Soil Design Infiltration Rate (in/hr)	Sizing Factor (% of contributing impervious area)[a]	Volume 3 Section providing Design Requirements
Bioretention Cell [b]	2 inch ponding depth	0.25	12.6%	4.4.5
		0.5	7.8%	
		1.0	4.6%	
	6 inch ponding depth	0.25	7.4%	
		0.5	4.6%	
		1.0	2.8%	
	12 inch ponding depth	0.25	NA	
		0.5	2.8%	
		1.0	1.7%	
Permeable Pavement Facility (may receive run-on)	6 inch storage reservoir depth	0.25	33.3%	4.4.7
		0.5	33.3%	
		1.0	33.3%	
Rainwater Harvesting	Facilities cannot be presized, applicant must provide water balance calculations demonstrating 95% average annual volume reused			4.4.6

sf – square feet; in/hr – inch per hour; % - percent

[a] BMP area is calculated as a function of impervious area draining to it: BMP Area = Contributing Impervious Area x Factor (%)/100

[b] Sizing factors are for bioretention facility bottom area. Total footprint area may be calculated based on side slopes (3H:1V), ponding depth, and freeboard.

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Table A.4. GSI Credits for GSI Evaluation Category 3: Impervious Surface Reduction Methods

BMP	Design Variable	Sizing Equation (% of contributing impervious area)[a]	GSI Credit (%)[b]	Volume 3 Section providing Design Requirements
Permeable Pavement Surface (may not receive run-on)	Slope less than or equal to 2%	NA	100%	4.4.7
	Slope 2%-5%	NA	60%	
Green Roofs	4 inch depth growing medium	NA	59%	4.4.8
	8 inch depth growing medium	NA	70%	
Bioretention with Detention	0.25 in/hr	[0.0382xA] + 199	85%	4.4.5
	0.5 in/hr	[0.0297xA] + 129	85%	
	1.0 in/hr	[0.0208xA] + 97	85%	

sf – square feet; %-percent.
[a] Sizing factors are for bioretention facility bottom area.
[b] Impervious area mitigated by a BMP is calculated as: [GSI Credit (%)/100] x [Permeable Pavement Surface Area or Green Roof Area or impervious area directed to bioretention with detention]

Table A.5. Sizing Factors for GSI Evaluation Category 4: Non-infiltrating Facilities

BMP	Design Variable ,	Sizing Factor/Sizing Equation (% of contributing impervious area)[a]	GSI Credit (%)[b]	Volume 3 Section providing Design Requirements
Bioretention Planter with Underdrain [c]	6 inch ponding depth			4.4.5
	12 inch ponding depth	6.0%	100%	
Detention Cistern with Harvesting Capacity (SFR projects only)	Contributing area 100-380 sf	6.7sf	[21xLN(A)]-66.8	4.4.6
	Contributing area 380-700sf	0.000531 x [A^1.59]	[21xLN(A)]-66.8	
	Contributing area >700sf	0.000531 x [A^1.59]	[15.3xLN(A)]-29.8	

sf – square feet; in/hr – inch per hour; % - percent
[a] BMP bottom area is calculated as a function of impervious area draining to it: Bioretention Planter Area (square feet)= Contributing Impervious Area x Sizing Factor (%)/100 or Detention Cistern Area (square feet) = Factor x [A (square feet) ^Integer].
[b] Impervious area mitigated by a BMP is calculated as: [GSI Credit (%)/100] x [Impervious Area directed to Bioretention Planter] or [factor x LN(A)]- Factor
[c] See www.seattle.gov/util/greeninfrastructure for potential updates to bioretention planter with underdrain sizing.

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Appendix B: Engineering Design Feasibility Limits Checklist

The intent of Table B.1 is to help designers and reviewers evaluate general feasibility of GSI BMPs for a given site. For BMPs selected, the applicant must use the more detailed information and design requirements in the *City of Seattle Stormwater Flow Control and Water Quality Treatment Technical Requirements Manual* (Stormwater Manual Vol. 3, Director's Rule 17-2009). Applicants shall submit this checklist with permit applications as part of drainage review and approval.

Table B.1 Engineering Design Considerations for GSI Evaluation Category 1: Runoff Reduction Methods

BMP	Feasibility Considerations	Additional information from applicant
Maintain Existing Trees	☐ No existing trees in project area ☐ New and/or replaced ground level impervious surface not proposed within 20 feet of existing tree. ☐ For tree(s) with a diameter greater than or equal to 6", site design cannot avoid grading within the dripline or otherwise meet standards (per COS Standard Plans and Specifications) required for retention. ☐ For tree(s) with a diameter between 4-6": site design cannot avoid grading within 5 feet of tree trunk or otherwise meet standards (per COS Standard Plans and Specifications) required for retention.	
Dispersion – Downspout and Sheet Flow	☐ Dispersion evaluation is not required if site is single family residential project. ☐ Geotechnical evaluation recommends infiltration NOT be used anywhere within project area due to plausible concerns about erosion, slope failure, or other hazards (attach geotechnical report) ☐ Project within a landslide hazard area defined by the Regulations for Environmental Critical Areas ☐ Project area in or within 100 feet of a known contaminated site or abandoned landfill. ☐ Site design can only accommodate dispersion upgradient of septic system and flow may intersect drainfield. ☐ Site design can only accommodate dispersion within steep slope setback (calculated as 10 times the total slope rise, measured from the top of a slope, with a 500-foot maximum setback). Applicable if geotechnical analysis shows that infiltration is allowable within this setback. ☐ Site design can NOT accommodate the min 1% fall from the building to the GSI and from the GSI to the point of connection to the public system	

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Downspout Dispersion - Splash Block	☐ There are no downspouts ☐ Site design cannot accommodate a 50-foot minimum flow path for the dispersion area or a maximum of 700 sf drainage area to any dispersion area.	
Downspout Dispersion- Gravel Filled Trench	☐ There are no downspouts ☐ Site design cannot accommodate a maximum of 700 sf drainage area to any dispersion area, along with a 10 ft by 2 ft level trench followed by 25-foot minimum flow path.	
Sheet Flow Dispersion	☐ Site cannot be designed to sheet flow runoff. ☐ Impervious surface being dispersed cannot be graded to have less than a 15% slope. ☐ Site design cannot accommodate at least a 10-foot wide vegetation buffer for dispersion of the adjacent 20 feet of impervious surface	
New Trees	☐ Site design cannot accommodate space necessary for the mature height, size, and/or rooting depth for tree planting per the current COS Recommended Tree List	

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Table B.2. Engineering Design Considerations for GSI Evaluation Category 2: Infiltrating and Reuse Facilities

BMP	Feasibility Consideration	Additional information from applicant
All Infiltrating Facilities (including permeable paving facilities and bioretention without impermeable liner)	☐ Infiltration restrictions and setbacks per Stormwater Manual Vol. 3, Chapter 4.3 must be considered. Figure 4.2 "Infiltration Feasibility Flow Chart" is provided below for initial screening purposes. Infiltrating facilities may not be sited within**:** ☐ Landslide prone critical areas ☐ Setbacks from steep slope areas ☐ 100 feet of a known contaminated site or abandoned landfill ☐ Other setbacks presented in the Stormwater Manual Vol. 3 (e.g., setbacks from structures). ☐ The minimum vertical separation of one foot from the bottom of the facility to the underlying water table, bedrock or other impermeable layer cannot be achieved. ☐ Geotechnical evaluation recommends infiltration NOT be used anywhere within project area due to plausible concerns about erosion, slope failure, or other hazards (attach geotechnical report). ☐ Test Pits determined native soil infiltration rate to be less than 0.25inches/hr. ☐ Site design cannot accommodate the min 1% fall from the building to the GSI and for the system overflow from the GSI to the point of connection to approved discharge location per Stormwater manual Vol. 3 Section 4.2.5.	
Bioretention Facilities (without impermeable liner)	☐ Site design cannot accommodate bioretention areas because sites longitudinal surface slopes cannot be graded to less than 7 percent.	

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Permeable Pavement Facilities	☐ Site has high potential for concentrated pollutant spills ☐ Site design cannot accommodate permeable pavement wearing course on surface slopes less than 5 percent. ☐ Site design cannot avoid putting permeable pavement in areas likely to have excessive sediment contamination or in close proximity to areas that will be sanded. ☐ This is a right-of-way application and the project area does not have an approved location for permeable pavement use per the Right-of-Way Improvement Manual (Section 6.4). ☐ Site design cannot avoid a contributing tributary area more than 3 times larger than the permeable pavement facility.	
Rainwater Harvesting	☐ Rainwater harvesting evaluation is not required if project site is one of the following: o Single family residential project o Trail or sidewalk project o Roadway project o Parcel project with less than 10,000 sf new and replaced impervious surface. ☐ Project does not include a roof from which to harvest rainwater	

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Table B.3. Engineering Design Considerations for GSI Evaluation Category 3: Impervious Surface Reduction Methods

BMP	Feasibility Consideration	Additional information from applicant
Permeable Pavement Surface	☐ Site has high potential for concentrated pollutant spills ☐ Site design cannot accommodate permeable pavement wearing course on surface slopes less than 5 percent. ☐ Site design cannot avoid putting permeable pavement in areas likely to have excessive sediment contamination or in close proximity to areas that will be sanded. ☐ This is a right-of-way application and the project area does not have an approved location for permeable pavement use per the Right-of-Way Improvement Manual (Section 6.4). ☐ Site design cannot avoid a tributary area larger than the permeable pavement surface.	
Green Roof	☐ Green roof evaluation is not required if project site is one of the following: o Single family residential o Trail and Sidewalk Project o Roadway project o Parcel project with less than 5,000sf new and replaced impervious surface. ☐ Roof design has a slope greater than 2.5":12" (20%) ☐ Building cannot technically be designed to accommodate structural load of green roofs.	

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Bioretention with Detention	☐ Biroetention with Detention evaluation is not required if project site is one of the following: o Single family residential o Site does not have runoff concentrated from over 1500sf impervious surface ☐ Geotechnical evaluation recommends infiltration NOT be used anywhere within project area due to plausible concerns about erosion, slope failure, or other hazards (attach geotechnical report) ☐ Project within a landslide hazard area defined by the Regulations for Environmental Critical Areas ☐ Project area in or within 100 feet of a known contaminated site or abandoned landfill. ☐ Site design can only accommodate bioretention with detention upgradient of septic system and flow may intersect drainfield. ☐ Site design can only accommodate bioretention with detention within steep slope setback (calculated as 10 times the total slope rise, measured from the top of a slope, with a 500-foot maximum setback). Applicable if geotechnical analysis shows that infiltration is allowable within this setback. ☐ Site design can NOT accommodate the min 1% fall from the building to the GSI and from the GSI to the point of connection to the public system	

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Table B.4. Engineering Design Considerations for GSI Evaluation Category 4: Non-Infiltrating BMPs

BMP	Feasibility Consideration	Additional information from applicant
Bioretention Planter	☐ Site design cannot accommodate bioretention areas because site's longitudinal surface slopes cannot achieve less than 7 percent. ☐ Site design cannot accommodate the min 1% fall from the building to the GSI and for the system overflow from the GSI to the point of connection to approved discharge location per Stormwater Manual Vol. 3 Section 4.2.5.	
Detention Cistern with Rainwater Harvesting	☐ Detention cistern evaluation is not required because site is NOT Single family residential ☐ Site design cannot accommodate detention cisterns	

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Figure 4.2 Infiltration Feasibility Flow
Figure copied from Stormwater Manual Vol. 3, Chapter 4.3. to highlight technical feasibility criteria for completing Appendix B of this DR, Table B.2.

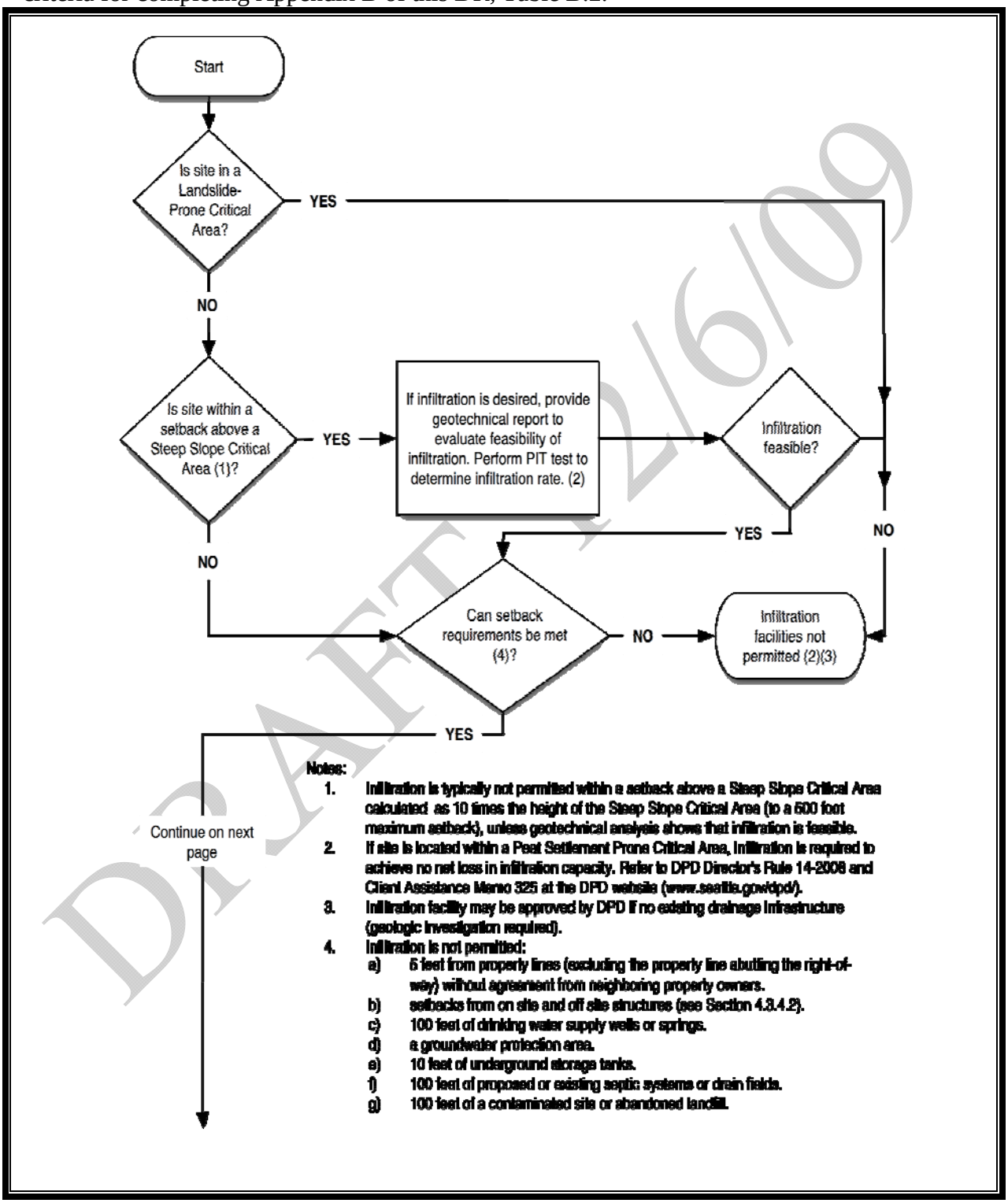

Figure 4.2. Infiltration Feasibility Flow Chart.

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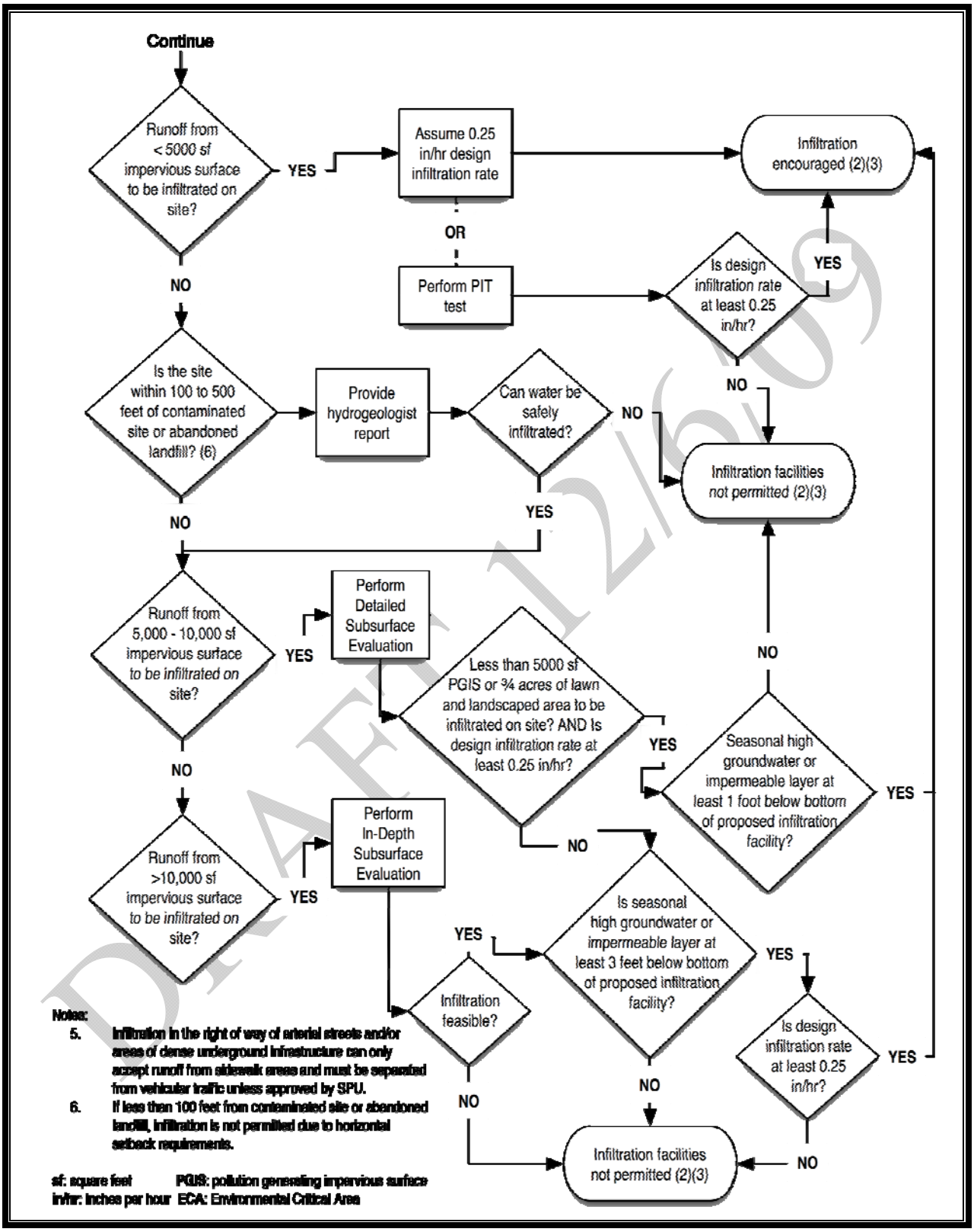

Figure 4.2 (continued). Infiltration Feasibility Flow Chart

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