



SUPPORTING DOCUMENT

STORMWATER BEST MANAGEMENT PRACTICE (BMP) INFEASIBILITY WORKSHEET

FOR

ON-SITE STORMWATER MANAGEMENT

All Best Management Practices (BMPs) are considered feasible until demonstrated otherwise. They must be considered in the order shown on BMP Lists 1, 2, or 3.

Use this worksheet to document the reasons why specific BMPs were not selected for use. A BMP may be considered infeasible based any on the conditions listed below. Cost is not a factor for determining infeasibility.

The infeasibility criteria listed below summarize, for convenience, the detailed criteria in the 2016 Kitsap County Stormwater Design Manual and the 2014 Stormwater Manual for Western Washington. Additional infeasibility criteria in those manuals may apply to your specific situation. References to the detailed criteria in both manuals are shown for each BMP below.

<u>TABLE OF CONTENTS</u>	<u>Page</u>
Soil Management Plan for Post Construction Soil Quality and Depth	2
Downspout Full Infiltration	2
Full Dispersion.....	3
Bioretention and Rain Gardens	3
Permeable Pavement.....	5
Downspout Dispersion.....	7
Concentrated Flow Dispersion.....	8
Perforated Stub-out Connection	9
Sheet Flow Dispersion.....	10

SOIL MANAGEMENT PLAN for POST-CONSTRUCTION SOIL QUALITY AND DEPTH

Infeasibility Criteria (Check all that apply)	Backup Information from Applicant
<input type="checkbox"/> This BMP is considered infeasible on portions of the site with till soils and slopes greater than 33%.	
References: <hr style="border: 0.5px solid black; margin: 5px 0;"/> <ul style="list-style-type: none"> See Kitsap County Brochure #57 and Supporting Document - Soil Management Plan for BMP T5.13. Also see 2016 Kitsap County Stormwater Design Manual, Volume II, Section 5.4.1, Page 5-22. Also see 2014 Stormwater Management Manual for Western Washington, Volume 5, Page 5-8, BMP T5.13. 	

DOWNSPOUT FULL INFILTRATION

Infeasibility Criteria (Check all that apply)	Backup Information from Applicant
<input type="checkbox"/> A professional geotechnical evaluation recommends against infiltration due to erosion, slope failure, or flooding concerns.	
<input type="checkbox"/> A professional evaluation finds the only area available for infiltration would threaten the safety or reliability of underground utilities, underground storage tanks, structures, road or parking lot surfaces, or subgrades.	
<input type="checkbox"/> A professional evaluation finds the only area available for infiltration does not allow for a safe overflow pathway.	
<input type="checkbox"/> A professional evaluation finds that infiltration would threaten shoreline structures such as bulkheads.	
<input type="checkbox"/> A professional evaluation finds that infiltration would threaten existing below-grade basements.	
<input type="checkbox"/> The site does not have outwash or loam soils.	
<input type="checkbox"/> Horizontal setbacks cannot be met.	
<input type="checkbox"/> There is not at least 1-foot of permeable soil between the bottom of the bioretention area and the seasonal high water table or impermeable layer (for drainage areas <u>less than</u> 5,000 square feet of pollution generating hard surface, and 10,000 square feet of hard surface, and 3/4 acre of pervious surface).	
<input type="checkbox"/> There is not at least 3-feet of permeable soil between the final grade and the seasonal high water table or impermeable layer (for drainage areas <u>over</u> 5,000 square feet of pollution generating hard surface, OR 10,000 square feet of hard surface, OR 3/4 acre of pervious surface).	

References:	
<input type="checkbox"/> See Kitsap County Brochure #53.	
<input type="checkbox"/> Also see 2016 Kitsap County Stormwater Design Manual, Volume II, Section 5.4.16, Page 5-53.	
<input type="checkbox"/> Also see 2014 Stormwater Management Manual for Western Washington, Volume 3, Section 3.1.1, Page 3-4, BMP T5.10A.	

FULL DISPERSION

Infeasibility Criteria (Check all that apply)	Backup Information from Applicant
<input type="checkbox"/> A professional geotechnical evaluation recommends against dispersion due to erosion, slope failure, or flooding concerns. <input type="checkbox"/> The only available dispersion flow path is within 10 feet uphill of a septic system or drain field. <input type="checkbox"/> The only available dispersion flow path is within an erosion hazard or a landslide hazard area. <input type="checkbox"/> The only available dispersion flow path is in a critical area, steep slope (over 15%), or setback to a steep slope. <input type="checkbox"/> The only available dispersion flow path is within 100 feet uphill of a contaminated site or abandoned landfill. <input type="checkbox"/> The minimum 100-foot flow path through native vegetation cannot be met. <input type="checkbox"/> A 65 to 10 ratio of native vegetation area to impervious area is unachievable References: <ul style="list-style-type: none"> • See Kitsap County Brochure #52. • Also see 2016 Kitsap County Stormwater Design Manual, Volume II, Section 5.4.4, Page 5-27. • Also see 2014 Stormwater Management Manual for Western Washington, Volume 5, Page 5-33, BMP T5.30. 	

BIORETENTION and RAIN GARDENS

Infeasibility Criteria (Check all that apply)	Backup Information from Applicant
<input type="checkbox"/> A professional geotechnical evaluation recommends against bioretention due to erosion, slope failure, or flooding concerns. <input type="checkbox"/> A professional evaluation finds the only area available for	

bioretention would threaten the safety or reliability of underground utilities, underground storage tanks, structures, road or parking lot surfaces, or subgrades.

- A professional evaluation finds the only area available for bioretention does not allow for a safe overflow pathway.
- A professional evaluation finds that bioretention would threaten shoreline structures such as bulkheads.
- A professional evaluation bioretention would threaten existing below-grade basements.
- A professional evaluation indicates that bioretention with an underdrain will likely direct infiltrated water to a nutrient sensitive waterbody.
- Ground water modeling indicates bioretention will likely alter the movement of pollutants in groundwater.
- Horizontal setbacks cannot be met.
- There is not at least 1-foot of permeable soil between the bottom of the bioretention area and the seasonal high water table or impermeable layer (for drainage areas less than 5,000 square feet of pollution generating hard surface, and 10,000 square feet of hard surface, and 3/4 acre of pervious surface).
- There is not at least 3-feet of permeable soil between the final grade and the seasonal high water table or impermeable layer (for drainage areas over 5,000 square feet of pollution generating hard surface, OR 10,000 square feet of hard surface, OR 3/4 acre of pervious surface).
- Bioretention is not compatible with the surrounding drainage system as determined by Kitsap County DCD (e.g., where the project drains to an existing approved stormwater collection system).
- The site cannot be reasonably designed to locate bioretention on slopes less than 8%.

Bioretention shall not be used:

- Within 100 feet of a drinking water well or spring.
- Within 30 feet uphill or 10 feet downhill of a residential septic drainfield.
- Within 10 feet of structures.
- Within 50 feet from the top of slopes that are greater than 20% and have over 10 feet of vertical relief.
- Within 10 feet of surface contaminated soils or 100 feet of deep contaminated soils.
- Within 100 feet of a closed or active landfill.

<ul style="list-style-type: none"> <input type="checkbox"/> Within 10 feet of an underground storage tank and connecting underground pipes when the size of the tank is under 1,100 gallons. <input type="checkbox"/> Within 100 feet of an underground storage tank and connecting underground pipes when the tank is over 1,100 gallons. <input type="checkbox"/> Where field testing indicates potential bioretention/rain garden sites have a measured (a.k.a., initial) native soil saturated hydraulic conductivity less than 0.30 inches per hour. <p>References:</p> <hr/> <ul style="list-style-type: none"> • See 2016 Kitsap County Stormwater Design Manual, Volume II, Section 5.4.5, Page 5-31. • Also see 2016 Kitsap County Stormwater Design Manual, Volume II, Section 5.4.6, Page 5-33. • Also see 2014 Stormwater Management Manual for Western Washington, Volume 5, Page 5-12, BMP T5.14A. • Also see 2014 Stormwater Management Manual for Western Washington, Volume 5, Page 5-13, BMP T5.14B. 	
--	--

PERMEABLE PAVEMENT	
Infeasibility Criteria (Check all that apply)	Backup Information from Applicant
<ul style="list-style-type: none"> <input type="checkbox"/> A professional evaluation finds that infiltration or ponded water below permeable pavement would compromise adjacent impervious pavement. <input type="checkbox"/> A professional geotechnical evaluation recommends against dispersion due to erosion, slope failure, or flooding concerns. <input type="checkbox"/> A professional evaluation finds that infiltration below permeable pavement would threaten existing below-grade basements. <input type="checkbox"/> A professional evaluation finds that infiltration below permeable pavement would threaten existing utilities or road subgrades. <input type="checkbox"/> A professional evaluation finds that permeable pavement would cause fill soils to become unstable when saturated. <input type="checkbox"/> A professional evaluation finds that permeable pavement cannot support heavy loads in areas with industrial activity. <input type="checkbox"/> A professional evaluation finds that infiltration from permeable pavement would threaten shoreline structures such as bulkheads. <input type="checkbox"/> Areas with steep slopes where water within the aggregate base layer or at the subgrade surface cannot be controlled by detention structures and may cause erosion or structural failure. <input type="checkbox"/> Areas with steep slopes where surface runoff velocity may prevent adequate infiltration. 	

- Pavement is within 100 feet of a drinking water well or spring.
- Pavement is within 30 feet uphill or 10 feet downhill of a residential septic drainfield.
- The seasonal high water table or an impermeable layer would create saturated conditions within 1-foot of the bottom of the lowest gravel base course.
- Subgrade slopes exceed 5%.
- Pavement is within 50 feet of the top of a slope greater than 20%.
- Pavement is within 10 feet of surface contaminated soils or 100 feet of deep contaminated soils.
- Ground water modeling indicates infiltration will likely alter the movement of pollutants in groundwater.
- The pavement is in an area likely to have long term sediment deposition after construction (e.g., construction and landscaping material yards).
- The pavement is downhill of steep, erosion prone slopes that are likely to deposit sediment on the pavement.
- The site cannot be designed for porous asphalt surfaces at less than 5% slope, pervious concrete surfaces at less than 10% slope, or permeable paver surfaces at less than 12% slope.
- A professional evaluation finds that soils below a pollution – generating permeable pavement (e.g., road, parking lot) do not meet the soil suitability criteria to provide treatment.
- A professional evaluation finds that underlying soils are unsuitable to support traffic loads when saturated.
- The paved surface has an ADT exceeding 400 vehicles per day.
- The paved surface exceeds “very low truck traffic” (no through truck traffic, weekly utility truck traffic).
- The surface is subject to industrial activity incompatible with permeable surfaces.
- The surface is subject to pollutant spills, such as at gas stations, truck stops, and industrial chemical storage sites.
- Field testing indicates soils have a measured initial infiltration rate less than 0.3 inches per hour.
- The site is contaminated or an abandoned landfill.
- The pavement would be within 10 feet of an underground petroleum, chemical, or waste storage tank or underground connecting pipes.

References:

- See 2016 Kitsap County Stormwater Design Manual, Volume II,

Section 5.4.8, Page 5-38.

- Also see 2014 Stormwater Management Manual for Western Washington, Volume 5, Page 5-15, BMP T5.15.

DOWNSPOUT DISPERSION

Infeasibility Criteria (Check all that apply)

Backup Information from Applicant

- The flow path cannot be properly vegetated.
- A professional geotechnical evaluation recommends against dispersion due to erosion, slope failure, or flooding concerns.
- The only available dispersion flow path is within 10 feet uphill of a septic system or drain field.
- The only available dispersion flow path is within an erosion hazard or a landslide hazard area.
- The only available dispersion flow path is in a critical area, steep slope (over 15%), or setback to a steep slope.
- The only available dispersion flow path is within 100 feet uphill of a contaminated site or abandoned landfill.

For dispersion trenches:

- The minimum dispersion trench length cannot be met (10 feet of trench for every 700 square feet of drainage area).
- The minimum 25-foot flow path for dispersion trenches cannot be met.
- A vegetated flow path of 50 feet between the trench and a slope over 15% cannot be met.

For splash block dispersion:

- The minimum 50-foot flow path for splash blocks cannot be met.
- The drainage area to any splash block exceeds 700 square feet.

References:

- See 2016 Kitsap County Stormwater Design Manual, Volume II, Section 5.4.4, Page 5-27.
- Also see 2014 Stormwater Management Manual for Western Washington, Volume 3, Section 3.1.2, Page 3-11, BMP T5.10B.

CONCENTRATED FLOW DISPERSION

Infeasibility Criteria (Check all that apply)	Backup Information from Applicant
<p><input type="checkbox"/> A professional geotechnical evaluation recommends against dispersion due to erosion, slope failure, or flooding concerns.</p> <p><input type="checkbox"/> The only available dispersion flow path is within 10 feet uphill of a septic system or drain field.</p> <p><input type="checkbox"/> The only available dispersion flow path is within an erosion hazard or a landslide hazard area.</p> <p><input type="checkbox"/> The only available dispersion flow path is in a critical area, steep slope (over 15%), or setback to a steep slope.</p> <p><input type="checkbox"/> The only available dispersion flow path is within 100 feet uphill of a contaminated site or abandoned landfill.</p> <p><input type="checkbox"/> Horizontal setbacks cannot be met.</p> <p><input type="checkbox"/> Dispersion and flow path requirements cannot be met:</p> <ul style="list-style-type: none">• A minimum 10-foot dispersion trench followed by a 25-foot minimum flow path, OR a 3-foot rock pad with a minimum 50-foot minimum flow path.• A maximum of 700 square feet of drainage area to any dispersion device. <p>References:</p> <hr/> <ul style="list-style-type: none">• See 2016 Kitsap County Stormwater Design Manual, Volume II, Section 5.4.4, Page 5-27.• Also see 2014 Stormwater Management Manual for Western Washington, Volume 5, Page 5-3, BMP T5.11.	

PERFORATED STUB-OUT CONNECTION

<p align="center">Infeasibility Criteria (Check all that apply)</p>	<p align="center">Backup Information from Applicant</p>
<p><input type="checkbox"/> A professional geotechnical evaluation recommends against infiltration due to erosion, slope failure, or flooding concerns.</p> <p><input type="checkbox"/> A professional evaluation finds the only area available for infiltration would threaten the safety or reliability of underground utilities, underground storage tanks, structures, road or parking lot surfaces, or subgrades.</p> <p><input type="checkbox"/> A professional evaluation finds the only area available for infiltration does not allow for a safe overflow pathway.</p> <p><input type="checkbox"/> A professional evaluation finds the infiltration pathway would intersect a septic drainfield or reserve area.</p> <p><input type="checkbox"/> A professional evaluation finds that infiltration would threaten shoreline structures such as bulkheads.</p> <p><input type="checkbox"/> A professional evaluation finds that infiltration would threaten existing below-grade basements.</p> <p><input type="checkbox"/> Horizontal setbacks cannot be met.</p> <p><input type="checkbox"/> There is not a minimum of 1-foot of permeable soil between the bottom of the perforated pipe and the seasonal high water table or impermeable layer.</p> <p><input type="checkbox"/> The only location for the perforated pipe is under impervious or compacted (e.g., driveways, parking areas) surfaces.</p> <p><input type="checkbox"/> A minimum of 10 feet of perforated pipe per 5,000 square foot of contributing roof area is not possible.</p> <p><input type="checkbox"/> The only location for the perforated pipe is on slopes of 20% or greater.</p> <p>References:</p> <hr/> <ul style="list-style-type: none"> • See 2016 Kitsap County Stormwater Design Manual, Volume II, Section 5.4.7, Page 5-36. • Also see 2014 Stormwater Management Manual for Western Washington, Volume 3, Section 3.1.3, Page 3-17, BMP T5.10C. 	

SHEET FLOW DISPERSION

Infeasibility Criteria (Check all that apply)	Backup Information from Applicant
<p><input type="checkbox"/> A professional geotechnical evaluation recommends against dispersion due to erosion, slope failure, or flooding concerns.</p> <p><input type="checkbox"/> The only available dispersion flow path is within 10 feet uphill of a septic system or drain field.</p> <p><input type="checkbox"/> For flat to moderately sloped areas, a minimum 10-foot wide vegetated flow path is not possible.</p> <p><input type="checkbox"/> For variably sloped areas, a minimum 25-foot wide vegetated flow path is not possible.</p> <p><input type="checkbox"/> The only available dispersion flow path is within an erosion hazard or a landslide hazard area.</p> <p><input type="checkbox"/> The only available dispersion flow path is in a critical area, steep slope (over 15%), or setback to a steep slope.</p> <p><input type="checkbox"/> The only available dispersion flow path is within 100 feet uphill of a contaminated site or abandoned landfill.</p> <p><input type="checkbox"/> Positive drainage is not possible.</p> <p><input type="checkbox"/> The drainage area has a slope of 15% or more.</p> <p>References:</p> <hr/> <ul style="list-style-type: none">• See 2016 Kitsap County Stormwater Design Manual, Volume II, Section 5.4.4, Page 5-27.• Also see 2014 Stormwater Management Manual for Western Washington, Volume 5, Page 5-6, BMP T5.12.	