



Infeasibility Criteria Worksheet

The following tables summarize infeasibility criteria that can be used to justify not using various on-site stormwater management best management practices (BMPs) for consideration for Minimum Requirement #5. This information is also included under the detailed descriptions of each BMP in the 2016 City of Gig Harbor Stormwater and Site Development Manual (GHSWSDM) but provided here in this worksheet for ease of use and efficiency. Where any inconsistencies or lack of clarity exists, the requirements in the main text of the GHSWSDM shall be applied. If a project is limited by one or more of the infeasibility criteria specified below, but an applicant is interested in implementing a specific BMP, a functionally equivalent design may be submitted to the City for review and approval.

HOW TO USE:

- 1) Evaluate the feasibility of the BMPs in priority order based on List #1 or List #2 (Stormwater Minimum Req. CAM).
- 2) Select the first BMP that is considered feasible for each surface type.
- 3) In the space provided below document the infeasibility (narrative description and rationale) for each BMP that was not selected. Attach additional pages for supporting information if necessary.

Only one infeasibility criterion needs to be selected for a BMP before evaluating the next BMP on the list.

Lawn and Landscaped Areas		
BMP and Applicable Lists	Infeasibility Criteria	Infeasibility Description and Rationale for each BMP Not Selected
Soil Preservation and Amendment (GHSWSDM Volume III, Section 3.1)	<input type="checkbox"/> Site setbacks and design criteria provided in Volume III, Section 3.1 cannot be achieved.	

Roofs		
BMP and Applicable Lists	Infeasibility Criteria	Infeasibility Description and Rationale for each BMP Not Selected
65/10 Dispersion (GHSWSDM Volume III, Section 3.2.2)	<input type="checkbox"/> Site setbacks and design criteria provided in Section 3.2.2 cannot be achieved. <input type="checkbox"/> A 65 to 10 ratio of forested or native vegetation area to impervious area cannot be achieved. <input type="checkbox"/> A minimum forested or native vegetation flow path length of 100 feet (25 feet for sheet flow from a non-native pervious surface) cannot be achieved.	



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Roofs		
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<p>Downspout Infiltration Systems (GHSWSDM Volume III, Section 3.8.3)</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Site setbacks and design criteria provided in Section 3.2.2 cannot be achieved. <input type="checkbox"/> The lot(s) or site does not have outwash or loam soils. <input type="checkbox"/> There is not at least 1 foot or more of permeable soil from the proposed bottom (final grade) of the infiltration system to the seasonal high groundwater table. 	
<p>Downspout Dispersion Systems (GHSWSDM Volume III, Section 3.8.4)</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Site setbacks and design criteria provided in Volume III, Section 3.8 cannot be achieved. <input type="checkbox"/> A vegetated flow path at least 50 feet in length from the downspout to the downstream property line, structure, slope over 20 percent, stream, wetland, or other impervious surface is not feasible. <input type="checkbox"/> A vegetated flow path of at least 25 feet in between the outlet of the trench and any property line, structure, stream, wetland, or impervious surface is not feasible. 	
<p>Bioretention or Rain Gardens (GHSWSDM Volume III, Section 3.3)</p>	<p><i>Note: Criteria with setback distances are as measured from the bottom edge of the bioretention soil mix.</i></p> <ul style="list-style-type: none"> <input type="checkbox"/> Site setbacks provided in Volume III, Section 3.3.6 cannot be achieved. <p>Citation of any of the following infeasibility criteria must be based on an evaluation of site-specific conditions and a written recommendation from an appropriate licensed professional (e.g., engineer, geologist, hydrogeologist):</p> <ul style="list-style-type: none"> <input type="checkbox"/> Where professional geotechnical evaluation recommends infiltration not be used due to reasonable concerns about erosion, slope failure, or downgradient flooding. <input type="checkbox"/> In accordance with Chapter 18.08 GHMC limitations may exist and reports may be required when bioretention area is within 300 feet of a landslide hazard area or within 200 feet of an erosion hazard area. <input type="checkbox"/> Where the only area available for siting would threaten the safety or reliability of pre-existing underground utilities, pre-existing underground storage tanks, pre- 	



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BMP and Applicable Lists	Infeasibility Criteria	Infeasibility Description and Rationale for each BMP Not Selected
<p>Bioretention or Rain Gardens (cont.)</p>	<p>existing structures, or pre-existing road or parking lot surfaces.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Where the only area available for siting does not allow for a safe overflow pathway to stormwater drainage system or private storm sewer system. <input type="checkbox"/> Where there is a lack of usable space for bioretention areas at re-development sites, or where there is insufficient space within the existing public right-of-way on public road projects. <input type="checkbox"/> Where infiltrating water would threaten existing below grade basements. <input type="checkbox"/> Where infiltrating water would threaten shoreline structures such as bulkheads. <p>The following criteria can be cited as reasons for infeasibility without further justification (though some require professional services to make the observation):</p> <ul style="list-style-type: none"> <input type="checkbox"/> Where they are not compatible with surrounding drainage system as determined by the city (e.g., project drains to an existing stormwater collection system whose elevation or location precludes connection to a properly functioning bioretention area). <input type="checkbox"/> Where land for bioretention is within an erosion hazard, or landslide hazard area (as defined by Chapter 18.08 GHMC). <input type="checkbox"/> Where the site cannot be reasonably designed to locate bioretention areas on slopes less than 8 percent. <input type="checkbox"/> For properties with known soil or groundwater contamination (typically federal Superfund sites or state cleanup sites under the Model Toxics Control Act (MTCA)): <ul style="list-style-type: none"> · Within 100 feet of an area known to have deep soil contamination. · Where groundwater modeling indicates infiltration will likely increase or change the direction of the migration of pollutants in the groundwater. · Wherever surface soils have been found to be contaminated unless those soils are removed within 10 horizontal feet from the infiltration area. 	



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BMP and Applicable Lists	Infeasibility Criteria	Infeasibility Description and Rationale for each BMP Not Selected
<p>Bioretention or Rain Gardens (cont.)</p>	<ul style="list-style-type: none"> · Any area where these facilities are prohibited by an approved cleanup plan under the state Model Toxics Control Act or Federal Superfund Law, or an environmental covenant under Chapter 64.70 RCW. <input type="checkbox"/> Within 100 feet of a closed or active landfill. <input type="checkbox"/> Within 30 feet upgradient, or 10 feet downgradient, of the drainfield primary and reserve areas (per WAC 246-272A-0210). This requirement may be modified by the Tacoma-Pierce County Health Department if site topography clearly prohibits flows from intersecting the drainfield or where site conditions (soil permeability, distance between systems, etc.) indicate that this is unnecessary. <input type="checkbox"/> Within 10 feet of an underground storage tank and connecting underground pipes when the capacity of the tank and pipe system is 1100 gallons or less. (As used in these criteria, an underground storage tank means any tank used to store petroleum products, chemicals, or liquid hazardous wastes of which 10 percent or more of the storage volume (including volume in the connecting piping system) is beneath the ground surface. <input type="checkbox"/> Within 100 feet of an underground storage tank and connecting underground pipes when the capacity of the tank and pipe system is greater than 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. A small-scale or large-scale PIT in accordance with Appendix III-A shall be used to demonstrate infeasibility of bioretention areas. If the measured native soil infiltration rate is less than 0.30 in/hour, bioretention/rain garden BMPs are not required to be evaluated as an option in List #1 or List #2. In these slow draining soils, a bioretention area with an underdrain may be used to treat pollution-generating surfaces to help meet Minimum Requirement #6, Runoff Treatment. If the underdrain is elevated within a base course of gravel, it will also provide some modest flow reduction benefit that will help achieve Minimum Requirement #7. 	



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<p>Perforated Stub-Out Connections GHSWSDM Volume III, Section 3.8.5)</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Site setbacks and design criteria provided in Volume III, Section 3.8.5 cannot be achieved. <input type="checkbox"/> There is not at least 12 inches or more of permeable soil from the proposed bottom (final grade) of the perforated stub-out connection trench to the highest estimated groundwater table. <input type="checkbox"/> The only location available for the perforated stub-out connection is under impervious or heavily compacted soils. <input type="checkbox"/> For sites with septic systems, the only location available for the perforated portion of the pipe is located upgradient of the drain field primary and reserve areas. <input type="checkbox"/> The connecting pipe discharges to a stormwater facility designed to meet Minimum Requirement #7. 	

Other Hard Surfaces		
BMP and Applicable Lists	Infeasibility Criteria	Infeasibility Description and Rationale for each BMP Not Selected
<p>65/10 Dispersion (GHSWSDM Volume III, Section 3.2.2)</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Site setbacks and design criteria provided in Section 3.2.2 cannot be achieved. <input type="checkbox"/> A 65 to 10 ratio of forested or native vegetation area to impervious area cannot be achieved. <input type="checkbox"/> A minimum forested or native vegetation flow path length of 100 feet (25 feet for sheet flow from a non-native pervious surface) cannot be achieved. 	
<p>Permeable Pavement (GHSWSDM Volume III, Section 3.4)</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Setbacks and site constraints provided in Volume III, Section 3.4.6 cannot be achieved <p>Citation of any of the following infeasibility criteria must be based on an evaluation of site-specific conditions and a written recommendation from an appropriate licensed professional (e.g., engineer, geologist, hydrogeologist):</p>	



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Other Hard Surfaces		
BMP and Applicable Lists	Infeasibility Criteria	Infeasibility Description and Rationale for each BMP Not Selected
<p>Permeable Pavement (cont.)</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Where professional geotechnical evaluation recommends infiltration not be used due to reasonable concerns about erosion, slope failure, or downgradient flooding. <input type="checkbox"/> In accordance with Chapter 18.08 GHMC limitations may exist and reports may be required when permeable pavement is within 300 feet of a landslide hazard area or within 200 feet of an erosion hazard area. <input type="checkbox"/> Where infiltrating and ponded water below the new permeable pavement area would compromise adjacent impervious pavements. •Where infiltrating water below a new permeable pavement area would threaten existing below grade basements. <input type="checkbox"/> Where infiltrating water would threaten shoreline structures such as bulkheads. <input type="checkbox"/> Down slope of steep, erosion prone areas that are likely to deliver sediment. <input type="checkbox"/> Where fill soils are used that can become unstable when saturated. <input type="checkbox"/> Excessively steep slopes where water within the aggregate base layer or at the subgrade surface cannot be controlled by detention structures and may cause erosion and structural failure, or where surface runoff velocities may preclude adequate infiltration at the pavement surface. <input type="checkbox"/> Where permeable pavements cannot provide sufficient strength to support heavy loads at industrial facilities such as ports. <input type="checkbox"/> Where installation of permeable pavement would threaten the safety or reliability of pre-existing underground utilities, pre-existing underground storage tanks, or pre-existing road subgrades. <p>The following criteria can be cited as reasons for infeasibility without further justification (though some require professional services to make the observation):</p> <ul style="list-style-type: none"> <input type="checkbox"/> For properties with known soil or groundwater contamination (typically federal Superfund sites or state cleanup sites under the Model Toxics Control Act (MTCA)): <ul style="list-style-type: none"> · Within 100 feet of an area known to have deep soil contamination. 	



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BMP and Applicable Lists	Infeasibility Criteria	Infeasibility Description and Rationale for each BMP Not Selected
Permeable Pavement (cont.)	<ul style="list-style-type: none"> · Where groundwater modeling indicates infiltration will likely increase or change the direction of the migration of pollutants in the groundwater. · Wherever surface soils have been found to be contaminated unless those soils are removed within 10 horizontal feet from the infiltration area. · Any area where these facilities are prohibited by an approved cleanup plan under the state Model Toxics Control Act or Federal Superfund Law, or an environmental covenant under Chapter 64.70 RCW. <ul style="list-style-type: none"> <input type="checkbox"/> Within 100 feet of a closed or active landfill. <input type="checkbox"/> Within 10 feet of any underground storage tank and connecting underground pipes, regardless of tank size. As used in these criteria, an underground storage tank means any tank used to store petroleum products, chemicals, or liquid hazardous wastes of which 10 percent or more of the storage volume (including volume in the connecting piping system) is beneath the ground surface. <input type="checkbox"/> At multi-level parking garages, and over culverts and bridges. <input type="checkbox"/> Where the site design cannot avoid putting pavement in areas likely to have long-term excessive sediment deposition after construction (e.g., construction and landscaping material yards). <input type="checkbox"/> Where the site cannot reasonably be designed to have a porous asphalt surface at less than 5 percent slope, or a pervious concrete surface at less than 10 percent slope, or a permeable interlocking concrete pavement surface (where appropriate) at less than 12 percent slope. Grid systems upper slope limit can range from 6 to 12 percent; check with manufacturer and local supplier. <input type="checkbox"/> Where the subgrade soils below a pollution-generating permeable pavement (e.g., road or parking lot) do not meet the soil suitability criteria for providing treatment. See soil suitability criteria for treatment in Chapter 6 of Volume V. Note: In these instances, the city may approve installation of a six-inch sand filter layer meeting city specifications for treatment as a condition of construction. <input type="checkbox"/> Where underlying soils are unsuitable for supporting traffic loads when saturated. Soils meeting a California 	



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BMP and Applicable Lists	Infeasibility Criteria	Infeasibility Description and Rationale for each BMP Not Selected
<p>Permeable Pavement (cont.)</p>	<p>Bearing Ratio of 5 percent are considered suitable for residential access roads.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Where appropriate field testing indicates soils have a measured (a.k.a., initial) subgrade soil saturated hydraulic conductivity less than 0.3 inches per hour. Only small-scale PIT or large-scale PIT methods in accordance with Appendix III-A shall be used to evaluate infeasibility of permeable pavement areas. (Note: In these instances, unless other infeasibility restrictions apply, roads and parking lots may be built with an underdrain, preferably elevated within the base course, if flow control benefits are desired.) <input type="checkbox"/> Where the road type is classified as arterial or collector rather than access. See RCW 35.78.010, RCW 36.86.070, and RCW 47.05.021. Note: This infeasibility criterion does not extend to sidewalks and other non-traffic bearing surfaces associated with the collector or arterial. <input type="checkbox"/> Where replacing existing impervious surfaces unless the existing surface is a non-pollution generating surface over an outwash soil with a saturated hydraulic conductivity of four inches per hour or greater. <input type="checkbox"/> At sites defined as “high-use sites.” For more information on high-use sites, refer to the Glossary in Volume I; and Volume V, Section 2.1, Step 3. <input type="checkbox"/> In areas with “industrial activity” as defined in the Glossary (located in Volume I). <input type="checkbox"/> Where the risk of concentrated pollutant spills is more likely such as gas stations, truck stops, and industrial chemical storage sites. <input type="checkbox"/> Where routine, heavy applications of sand occur in frequent snow zones to maintain traction during weeks of snow and ice accumulation. 	
<p>Bioretention or Rain Gardens (GHSWSDM Volume III, Section 3.3)</p>	<p><i>Note: Criteria with setback distances are as measured from the bottom edge of the bioretention soil mix.</i></p> <ul style="list-style-type: none"> <input type="checkbox"/> Site setbacks provided in Volume III, Section 3.3.6 cannot be achieved. <p>Citation of any of the following infeasibility criteria must be based on an evaluation of site-specific conditions and a</p>	



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<p>Bioretention or Rain Gardens (cont.)</p>	<p>written recommendation from an appropriate licensed professional (e.g., engineer, geologist, hydrogeologist):</p> <ul style="list-style-type: none"> <input type="checkbox"/> Where professional geotechnical evaluation recommends infiltration not be used due to reasonable concerns about erosion, slope failure, or downgradient flooding. <input type="checkbox"/> In accordance with Chapter 18.08 GHMC limitations may exist and reports may be required when bioretention area is within 300 feet of a landslide hazard area or within 200 feet of an erosion hazard area. <input type="checkbox"/> Where the only area available for siting would threaten the safety or reliability of pre-existing underground utilities, pre-existing underground storage tanks, pre-existing structures, or pre-existing road or parking lot surfaces. <input type="checkbox"/> Where the only area available for siting does not allow for a safe overflow pathway to stormwater drainage system or private storm sewer system. <input type="checkbox"/> Where there is a lack of usable space for bioretention areas at re-development sites, or where there is insufficient space within the existing public right-of-way on public road projects. <input type="checkbox"/> Where infiltrating water would threaten existing below grade basements. <input type="checkbox"/> Where infiltrating water would threaten shoreline structures such as bulkheads. <p>The following criteria can be cited as reasons for infeasibility without further justification (though some require professional services to make the observation):</p> <ul style="list-style-type: none"> <input type="checkbox"/> Where they are not compatible with surrounding drainage system as determined by the city (e.g., project drains to an existing stormwater collection system whose elevation or location precludes connection to a properly functioning bioretention area). <input type="checkbox"/> Where land for bioretention is within an erosion hazard, or landslide hazard area (as defined by Chapter 18.08 GHMC). <input type="checkbox"/> Where the site cannot be reasonably designed to locate bioretention areas on slopes less than 8 percent. <input type="checkbox"/> For properties with known soil or groundwater contamination (typically federal Superfund sites or state 	



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<p>Bioretention or Rain Gardens (cont.)</p>	<p>cleanup sites under the Model Toxics Control Act (MTCA):</p> <ul style="list-style-type: none"> · Within 100 feet of an area known to have deep soil contamination. · Where groundwater modeling indicates infiltration will likely increase or change the direction of the migration of pollutants in the groundwater. · Wherever surface soils have been found to be contaminated unless those soils are removed within 10 horizontal feet from the infiltration area. · Any area where these facilities are prohibited by an approved cleanup plan under the state Model Toxics Control Act or Federal Superfund Law, or an environmental covenant under Chapter 64.70 RCW. <ul style="list-style-type: none"> <input type="checkbox"/> Within 100 feet of a closed or active landfill. <input type="checkbox"/> Within 30 feet upgradient, or 10 feet downgradient, of the drainfield primary and reserve areas (per WAC 246-272A-0210). This requirement may be modified by the Tacoma-Pierce County Health Department if site topography clearly prohibits flows from intersecting the drainfield or where site conditions (soil permeability, distance between systems, etc.) indicate that this is unnecessary. <input type="checkbox"/> Within 10 feet of an underground storage tank and connecting underground pipes when the capacity of the tank and pipe system is 1100 gallons or less. (As used in these criteria, an underground storage tank means any tank used to store petroleum products, chemicals, or liquid hazardous wastes of which 10 percent or more of the storage volume (including volume in the connecting piping system) is beneath the ground surface. <input type="checkbox"/> Within 100 feet of an underground storage tank and connecting underground pipes when the capacity of the tank and pipe system is greater than 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. A small-scale or large-scale PIT in accordance with Appendix III-A shall be used to demonstrate infeasibility of bioretention areas. If the measured native soil infiltration rate is less than 0.30 in/hour, bioretention/rain garden BMPs are not required to be evaluated as an 	



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Bioretention or Rain Gardens (cont.)	option in List #1 or List #2. In these slow draining soils, a bioretention area with an underdrain may be used to treat pollution-generating surfaces to help meet Minimum Requirement #6, Runoff Treatment. If the underdrain is elevated within a base course of gravel, it will also provide some modest flow reduction benefit that will help achieve Minimum Requirement #7.	
Sheet Flow Dispersion (GHSWSDM Volume III, Section 3.2.3)	<ul style="list-style-type: none"> <input type="checkbox"/> Site setbacks and design criteria provided in Volume III, Section 3.2 cannot be achieved. <input type="checkbox"/> Positive drainage for sheet flow runoff cannot be achieved. •Area to be dispersed (e.g., driveway, patio) cannot be graded to have less than a 15 percent slope. <input type="checkbox"/> At least a 10-foot-wide vegetation buffer for dispersion of the adjacent 20 feet of impervious surface cannot be achieved. 	
Concentrated Flow Dispersion (GHSWSDM Volume III, Section 3.2.4)	<ul style="list-style-type: none"> <input type="checkbox"/> Site setbacks and design criteria provided in Volume III, Section 3.2 cannot be achieved. <input type="checkbox"/> A minimum 3-foot length of rock pad and 50-foot flow path for every 700 sf of drainage area followed with applicable setbacks cannot be achieved. <input type="checkbox"/> More than 700 sf drainage area drains to any dispersion device. Siting and design criteria cannot be achieved on site. 	