



APPENDIX A - RAINFALL CAPTURE TARGETS & GSI SELECTION

Green Stormwater Infrastructure Design Guidelines for the Capital Region

SPRING 2019

Rainfall Amounts and Capture Targets

Volume Reduction

These rainfall capture targets are used to calculate the volume of rainfall that falls on the impervious surface (thus generating stormwater runoff) to be captured, infiltrated, treated and/or detained.

The typical target is to capture and retain 72% of the 2-year, 24-hour event volume, which is roughly equivalent to the 6-month, 24-hour post development flow volume, or 90% of annual rainfall.

Table 1 shows the rainfall capture targets assuming the typical design target of 72% of the 2-year, 24-hour event volume.

Table 1 Typical GSI Facility Design Guideline Rainfall Capture Targets

Rainfall Capture Depth "R"(mm) Targets for Design Guidelines – These "R" values to be used in the various sizing formulas for each GSI facility	
Climate Zone	Rainfall Capture Target* (R mm)
Core Area	32 mm – Gonzales rain gauge
Saanich Peninsula	39 mm – YYJ rain gauge
Westshore	47 mm – City of Langford IDF curve
Juan de Fuca EA	49 mm – Victoria Marine (Sooke) rain gauge* 65 mm – Jordan River rain gauge* 108 mm – Diversion reservoir rain gauge* 121 mm – Port Renfrew rain gauge*
Salt Spring Island & Southern Gulf Islands	32 mm – Saturna Island rain gauge*

Notes: *Rainfall capture targets are based on the current climate projections. Check with respective local governments for rainfall capture targets specific to design standards that they may have.

Consideration should be given to using climate adjusted rainfall capture targets for GSI. Climate Projections for the capital region (April 2017) can be found at: <https://www.crd.bc.ca/about/data/climate-change>

This climate change report outlines that the Single-Day Maximum Precipitation will increase by 20% (2% to 37% range, 10% to 90% percentile values) for year 2050 and 35% (11% to 54% range) for year 2080.

GSI Information Selection Table

Selecting the optimal GSI facility or facilities for a retrofit or a new development is an art as well as a science. Different factors must be considered when selecting GSI facilities that are appropriate for the site conditions, project budget and GSI drivers for a particular site. A traditional Stormwater Rehabilitation Unit (SRU) may also be required by the local government in order to meet water quality guidelines or municipal policies. Where a SRU is required, GSI may still be part of a treatment train. Table modified from: District of Saanich Stormwater Management Guidebook (2011, Unpublished Draft), technical aspects by Kerr Wood Leidal Associates Ltd. and Murdoch de Greeff Inc.

Table 2 GSI Information Selection Table

Green Stormwater Infrastructure (GSI) Facility Type	Design Driver for GSI (Stormwater Benefits)			Land Use Applications					Suitability for Site Constraints					Peripheral Benefits					Cost Criteria			
	Capture & Slow Volume Reduction into piped system with safe dispersion	Clean & Infiltrate Water Quality Treatment	Store & Convey Rate Control of Peak Flow / Detention with safe conveyance	Public Greenspace / Mixed Open Space ¹	Road Right of Ways ²	Single family/Low density 30-50% building coverage	High Density/Commercial/ Institutional 50-90% building coverage	Parking Lots	Steep Slopes	High water tables	Soils with Low Infiltration Potential	Shallow / Exposed Bedrock	Hot Spots / Historical Use / Historical Fill	Mimic Natural Processes	Aesthetics / Greenspace	Biodiversity	Aquatic Habitat Protection	Raise awareness / Educational	Traffic Calming	Installation	Maintenance	
Vegetated Facilities																						
Absorbent Landscapes	●	●	○	●	●	●	●	○	●	●	○	●	○	●	●	●	●	○	○	●	●	
Rain Gardens	●	●	●	●	●	●	●	○	○	●	○	●	●	●	●	●	●	○	○	●	●	
Curb Extensions/Traffic Islands/Medians	●	●	●	○	●	○	●	●	●	○	●	○	●	●	●	●	●	●	●	●	●	
Vegetated or Grassy Swales	●	●	●	●	●	●	●	●	●	●	○	●	●	●	●	●	●	●	○	●	●	
Infiltration Rain Planters	●	●	○	○	●	○	●	○	○	○	○	○	●	●	●	●	●	○	○	○	○	
Flow-Through Rain Planters	●	●	○	○	●	○	●	○	●	●	●	○	○	●	●	●	●	○	○	○	○	
Structural Soil Cells with Trees	○	●	○	○	●	○	●	○	○	○	○	○	○	●	●	○	○	○	○	○	○	
Green Roofs (Extensive)	●	●	○	○	○	○	●	○	●	●	●	●	●	●	●	●	○	○	○	○	○	
Constructed Wetlands, Wet & Dry Ponds	●	○	●	●	○	○	○	○	○	●	○	○	○	●	●	●	○	○	○	○	○	
Non-Vegetated Facilities																						
Pervious Paving Systems	●	●	●	○	●	●	●	●	○	○	○	○	○	●	○	○	○	○	○	○	○	
Cistern & Detention Tanks	○	○	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
Structural Soil Cell without Trees	○	●	○	○	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
Infiltration Trench & Soakaway Manholes	●	○	●	●	○	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
	Effectiveness			Application & Suitability									Benefits					Cost				
	●	High		●	Most Appropriate									●	High				●	Low		
	○	Medium or Variable		○	May be used if opportunities exist or requires under drain or further soil testing recommended									○	Medium or Variable				○	Med		
	○	Low		○	Not Applicable									○	Low				○	High		

¹ may include lands with building & parking lots

² dependent on road type