Rainwater Harvesting

This checklist is intended to highlight items critical to the performance of rainwater harvesting that need to be addressed in the design plans and verified by a City of Seattle (COS) Seattle Public Utilities (SPU) plan reviewer or a designated representative. Some items have detailed requirements that may not be explicitly stated; refer to the Stormwater Flow Control and Water Quality Treatment Technical Requirements Manual (Manual) for specifics. Resources and their links are listed at the bottom of this checklist.

Items identified by a **FC** are GSI Engineering Design Feasibility Considerations as discussed in Appendix B of the "Requirements for Green Stormwater Infrastructure to the Maximum Extent Feasible" Director's Rule that may prevent this technology from being implemented on the project site.

Technology Description
Rainwater harvesting is the capture and storage of rainwater for beneficial use. Roof runoff may be routed to cisterns for storage and nonpotable uses such as irrigation, toilet flushing and cold water laundry.

Design Requirements (Manual Volume 3, Section 4.4.6)

	Review Item
FC	1. Not required to be evaluated to meet GSI requirement for SFR projects, trail or sidewalk projects, roadway projects, or parcel projects with less than 10,000 sf new plus replaced impervious surface
	2. All components of the harvesting system are designed in accordance with the Uniform Plumbing code and all other applicable laws.
	3. The collection system includes gutters and downspouts as well as the piping and any other conveyance needed to route harvested water from harvest sources to the cistern.
	4. Pre-storage treatment is provided to divert debris and/or "first flows" prior to entering the storage system and to keep leaves and other larger debris from entering and clogging the system.
	5. Cistern/Storage System minimum design requirements:
	▪ If foundation is required, the foundation is shown as flat and demonstrated as capable of supporting the cistern weight when full of water
	▪ Design shows access points and drains for inspection and cleaning
	▪ Below ground design shows manhole riser sticking a minimum of 8 inches above the surrounding ground surface
	▪ Cleaning is possible by flushing through a drain, vacuuming or another approved method
	▪ A designated overflow is shown with a cross-sectional area equal to or greater that all the areas of the devices delivering water to the cistern, with a minimum diameter of 4 inches.
	▪ Design shows screening or other method to prevent mosquitoes and other life forms from entering the cistern systems
	▪ Design shows indicates an opaque container for an aboveground cistern to minimize algae growth

	6. Delivery is accomplished by a gravity system or pumps and pipes. Design indicates that water is drawn from at least 4 inches above the bottom of the tank.
	7. Overflow conveys flows, to an approved discharge point per Section 4.2.5.
	8. Water quality treatment provided. For projects routing harvested water to an indoor plumbing system, the Seattle-King County Department of Health must approve treatment system.
	9. Sizing
	▪ A PE stamped spreadsheet-based water balance model is provided that calculates roof runoff (equal to rainfall volume), water usage (e.g, irrigation, outdoor cleaning, and indoor plumbing), and overflow from the cistern and uses a minimum time step of 1 day. SPU GSI website provides additional information (http://www.seattle.gov/util/greeninfrastructure).
	▪ The Seattle 10-year precipitation series at a daily time step is used (can be linked from the GSI website (http://www.seattle.gov/util/greeninfrastructure).
	▪ If the spreadsheet model demonstrates that no overflows occur, the roof area was subtracted from the site-wide model.
	▪ For GSI to MEF sizing - If the spreadsheet model demonstrates that overflows will occur, a downstream BMP is shown on the drawings for meeting the residual flow control needs up to 95% of the average annual volume. A continuous model is provided that includes the cisterns and additional BMPs and demonstrates flow control compliance.
	▪ For flow control sizing - If the spreadsheet model demonstrates that overflows will occur, a downstream BMP is shown on the drawings for meeting the residual flow control needs. A continuous model is provided that includes the cisterns and additional BMPs and demonstrates flow control compliance.

Resources:

- Green Stormwater Infrastructure (GSI) website (specifications, CADD drawings, plant lists, links to other resources)
  http://www.seattle.gov/util/greeninfrastructure

- Stormwater Code, Director's Rules (Manual and GSI to MEF), Client Assistance Memos (CAMs), GSI and flow control calculators for pre-sized facilities
  http://www.seattle.gov/dpd/Codes/StormwaterCode/Overview/default.asp