

Detention Cistern

This checklist is intended to highlight items critical to the performance of a detention cistern 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
Detention Cisterns are tanks used for the capture and detention of stormwater runoff. Runoff from roof downspouts can be routed to cisterns for detention and slow release to an approved discharge point.

Design Requirements (Manual Volume 3, Section 4.6.6)

	Review Item
FC	1. Detention Cistern submitted as meeting green stormwater infrastructure is only applicable on SFR projects and meets these requirements:
	<ul style="list-style-type: none"> ▪ The cistern is located above ground ▪ The low flow orifice is 0.25 inches in diameter
	2. The collection system includes gutters and downspouts as well as the piping and any other conveyance needed to route runoff from the roof to the cistern.
	3. Plans show a filter screen or other debris barrier to prevent insects, leaves, and other larger debris from entering and clogging the system.
	4. Cistern minimum design requirements:
	<ul style="list-style-type: none"> ▪ Plans indicate that cisterns shall be installed in accordance with manufacturer’s installation instructions ▪ 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 ▪ Cistern is at least the size of a rain barrel (typically 55 gallons)
	5. Low flow orifice meets the following requirements:
	<ul style="list-style-type: none"> ▪ Minimum diameter is 0.25 inches above ground; 0.5 inches below ground ▪ Invert is at least 3 inches above the bottom of the cistern
	6. Overflow conveys flows exceeding the detention capacity of the system, to an approved discharge point per Section 4.2.5. or another BMP
	7. For cisterns where the lower portion will be used for harvesting stormwater, the following minimum requirements are met:
	<ul style="list-style-type: none"> ▪ Plans indicate that the harvested rainwater will only be used for outdoor non-potable uses ▪ For non-SFR projects, the outlet spigot is located below the low flow orifice

	<ul style="list-style-type: none"> ▪ The requirements of rainwater harvesting as presented in Section 4.4.6 of the Manual are also met
	8. Sizing
	<ul style="list-style-type: none"> ▪ GSI sizing based on Table A.5 of the GSI to the MEF Director’s Rule, or if a performance standard must be met the pre-sized approach shown in Table 4.7 was used and all of the following criteria were met: <ul style="list-style-type: none"> □ Project has < 10,000 square feet of new and replaced impervious area □ Cistern area was sized using the applicable sizing equation in Table 4.33 □ Low flow orifice is 0.25 inches □ Invert of overflow is set at the designated detention depth (3 or 4 feet) above inverts of low flow orifice. For intermediate ponding depths (between 3 and 4 feet), the cistern area is linearly interpolated □ The cistern walls are vertical to the designated overflow height □ The cistern bottom area is calculated as a function of the impervious area routed to it ▪ Continuous model was used and all of the following criteria were met: <ul style="list-style-type: none"> □ Procedure presented for vaults in Section 4.6.5.2 of the Manual was used and assumptions in Table 4.32 were applied

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>