

RainWise Sizing and Rebate Calculator Instructions

General Instructions

- Intended for use in Microsoft Excel. Using in other programs may cause errors.
- Enter inputs in white cells. Gray cells will show calculator outputs or may remain blank.
- To guide you through, instructions are in the **blue prompt box** and corresponding cells turn **green**.

For ALL Projects

1. Enter project information.
2. Select Project Type (Cistern, Rain Garden, or Cistern to Rain Garden).
3. Enter Contributing Roof Area in square feet.

For CISTERN Projects

4. The calculator will determine the Minimum Cistern Volume Required for a full rebate. This information is helpful for making decisions about Cistern Type and Number of Cisterns given project context.

5. Select the Cistern Type or select a User Defined option to enter a custom cistern.**

User Defined options include:

- a. Cylindrical - May be used for uniform cylindrical cisterns (e.g., Premier Plastics)
- b. Other - May be used for all other cistern geometries (e.g., slimline, ribbed tanks)

6. Enter total Number of Connected Cisterns.

7. If you selected a User Defined option in Step 5, follow prompts to enter the Cistern Overflow Height, Total Cistern Height and Volume, and/or Cistern Diameter, for a single cistern.

8. Check your Rebate Results in the blue box at the bottom of the calculator.

** If you use multiple cisterns of different sizes and/or geometries in series, see the Custom Cistern Sizing tab for guidance on developing User Defined inputs for an equivalent single cistern.

For RAIN GARDEN Projects

4. Enter the Measured Soil Infiltration Rate in inches per hour, rounded down to 0.3, 0.6, or 1 inches/hour.

5. The calculator will determine the Rain Garden Bottom Area required for a full rebate.

6. Determine whether you can fit the entire Rain Garden Bottom Area from Step 5 on your site (Yes/No). Consider side slope requirements to determine the total area requirements (see RainWise Details Sheet 2).

7. If No, enter the Rain Garden Bottom Area you can fit on your site for a partial rebate.

8. Check your Rebate Results in the blue box at the bottom of the calculator.

RainWise Sizing and Rebate Calculator

1

Contractor Name

Client Name

Project Address

Notes

2

Project Type

Select project type above

3

Contributing Roof Area¹

sf

4

Minimum Cistern Volume Required for Full Rebate

gal

5

Cistern Type²

6

No. Connected Cisterns

7

Cistern Overflow Height³

ft

4

Measured Soil Infiltration Rate

in/hr

5

Rain Garden Bottom Area Required for Full Rebate

sf

6

Can you fit this area on the site?

7

Constructed / planned Rain Garden Bottom Area

sf

4

Total Cistern Height⁴

ft

5

Single Cistern Volume⁵

gal

6

Cistern Diameter⁶

in

7

Total Cistern Live Storage Volume

gal

8

RainWise Rebate Results

Area Fully Managed⁷

0

square feet

Total Rebate⁸

\$0

Gallons Managed Annually⁹

0

gallons

Required Orifice Size¹⁰

N/A

RainWise Sizing and Rebate Calculator -- 2023

Contractor Name

Notes

Client Name

Project Address

RainWise Rebate

Project Type

Contributing Roof Area ¹

square feet

Select project type above

Cistern

Minimum Cistern Volume Required
for Maximum Rebate

gallons

Cistern Type ²

Number of Connected Cisterns

Rain Garden

Measured Soil Infiltration Rate

inches/hour

Rain Garden Bottom Area
Required for Full Rebate

square feet

Can you fit this area on the site?

Constructed / Planned Rain Garden
Bottom Area

square feet

Total Cistern Live Storage Volume

gallons

RainWise Rebate Results

Area Fully Managed ⁷

square feet

Total Rebate ⁸

Gallons Managed Annually ⁹

gallons

Required Orifice Size ¹⁰

Notes:

- 1) A RainWise project must mitigate runoff from at least 400 square feet of roof area (in total) to qualify for a RainWise rebate.
A cistern must collect runoff from a minimum of 300 square feet of roof area; there is no minimum for a rain garden.
This calculator must be used to determine rebates for Contributing Roof Areas up to 5,000 square feet.
For roof areas larger than 5,000 square feet, contact the RainWise Program Manager.
- 2) Qualifying cistern installations must have a minimum Cistern Overflow Height of 2 feet, and a Minimum Live Storage Volume of 180 gallons.
Multiple cisterns may be connected but may have only one flow control outlet at the outlet of the most downstream cistern (see RainWise Details Sheet 11).
- 3) Cistern Overflow Height is measured from the invert (bottom) of the flow control outlet to the invert (bottom) of the overflow outlet (see RainWise Details Sheet 9).
- 4) Total Cistern Height as specified by manufacturer.
- 5) Single Cistern Volume as specified by manufacturer.
- 6) Cistern Internal Diameter (i.e., manufacturer specified diameter minus 2x tank wall thickness).
- 7) Area Fully Managed is an estimate of the roof area fully managed to the program performance targets by the Cistern, Rain Garden, or Cistern to Rain Garden installation.
- 8) Maximum construction rebate for projects including Rain Gardens is \$7.00/square foot of Contributing Roof Area because of the vegetation and infiltration benefits Rain Gardens provide. Maximum construction rebate for Cistern projects is \$5.33/square foot of Contributing Roof Area, depending on Contributing Roof Area size.
- 9) Gallons Managed is an estimate of the annual runoff volume managed based on the calculations provided in the Green Stormwater Infrastructure in Seattle Implementation Strategy 2015 - 2020.
- 10) Orifice Diameter of Cistern flow control outlet.

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RainWise Custom Cistern Sizing

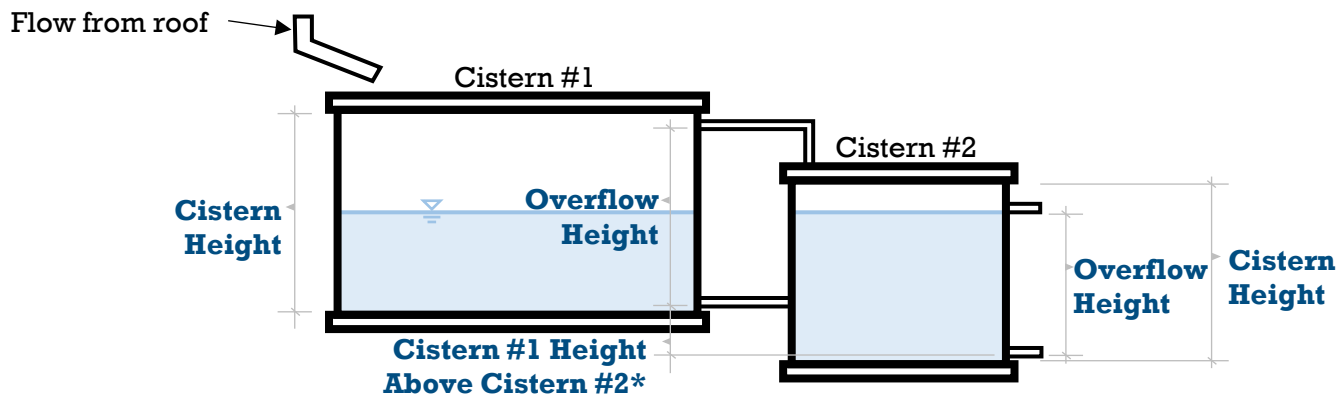
Purpose: If your project uses two cisterns of different sizes/geometries connected in series (i.e., controlled by one flow control outlet at the outlet of the most downstream cistern (see RainWise Details Sheet 11)), use this worksheet to determine *User Defined Cistern* inputs for an approximately equivalent single cistern. These inputs can be entered directly into the Sizing and Rebate Calculator to estimate cistern configuration performance.

You should not use this worksheet if you have two cisterns of the same size in series, or if you have a cistern that drains to a rain garden. Instead, you can input these configurations directly into the Sizing and Rebate Calculator.

Project Cistern Information

Enter information for each Project Cistern:

	Cistern #1	Cistern #2
Cistern Overflow Height ¹	<input type="text"/> feet	<input type="text"/> feet
Total Cistern Height ²	<input type="text"/> feet	<input type="text"/> feet
Single Cistern Volume ³	<input type="text"/> gallons	<input type="text"/> gallons
Cistern #1 Height Above Cistern #2 (measured from invert to invert of each tank's lowest outlet) ⁴	<input type="text"/> feet	



*Measured from invert to invert of each tank's lowest outlet. Enter negative value if Cistern #1 is below Cistern #2.

Enter the following *User Defined Cistern* information in the Sizing and Rebate Calculator tab.

Cistern

No. Connected Cisterns	<input type="text" value="1"/>
Cistern Type	<input type="text" value="User Defined - Other"/>
Cistern Overflow Height	<input type="text"/> feet
Total Cistern Height	<input type="text"/> feet
Single Cistern Volume	<input type="text"/> gallons

- 1) Cistern Overflow Height is measured from the invert (bottom) of the flow control outlet to the invert (bottom) of the overflow outlet (see RainWise Details Sheet 9).
- 2) Total Cistern Height as specified by manufacturer.
- 3) Single Cistern Volume as specified by manufacturer.
- 4) Cistern #1 Height above Cistern #2 will be a negative value if Cistern #1 is located below Cistern #2.

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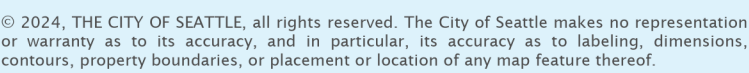
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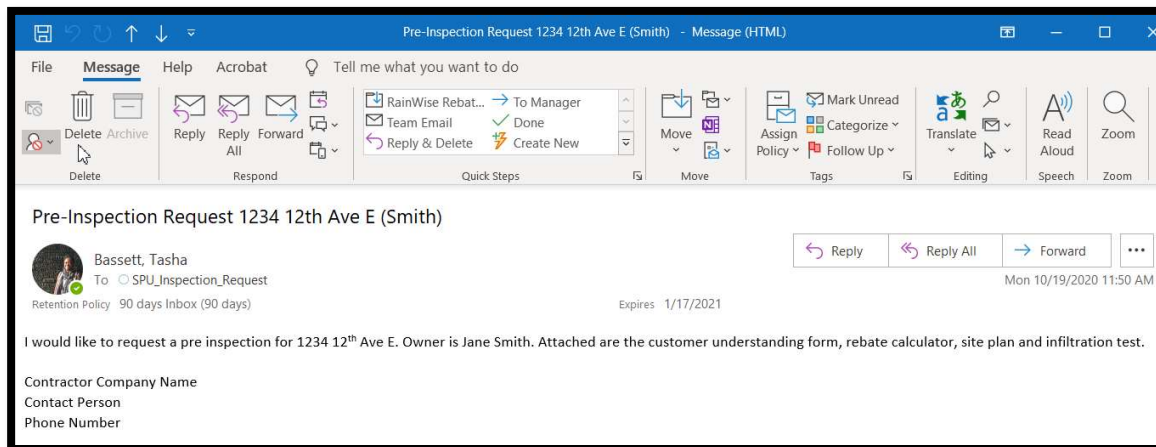
Eligible Parcels



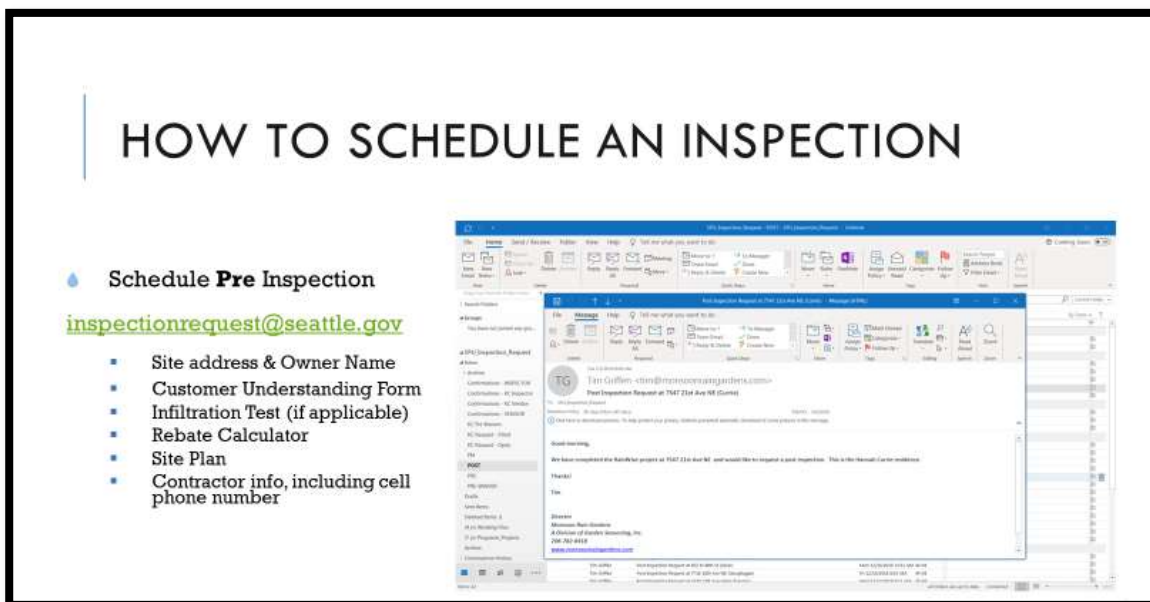


How to request a pre-inspection appointment:

- ❑ Please type in the email subject line: **Pre-Inspection Request at 1234 12th Ave E (Smith)**



- ❑ Include the following documents in your email:



The next available inspection appointment will be made for you on a specific date and time. If you are not able to make that appointment, please “decline” the appointment and indicate why. If you can make the appointment “accept” the appointment and show up at the appointment on the specific date and time.

If for any reason, you are not able to make the appointment the day OF the appointment. Please call the inspector and email the inspectionrequest@seattle.gov to let us know.

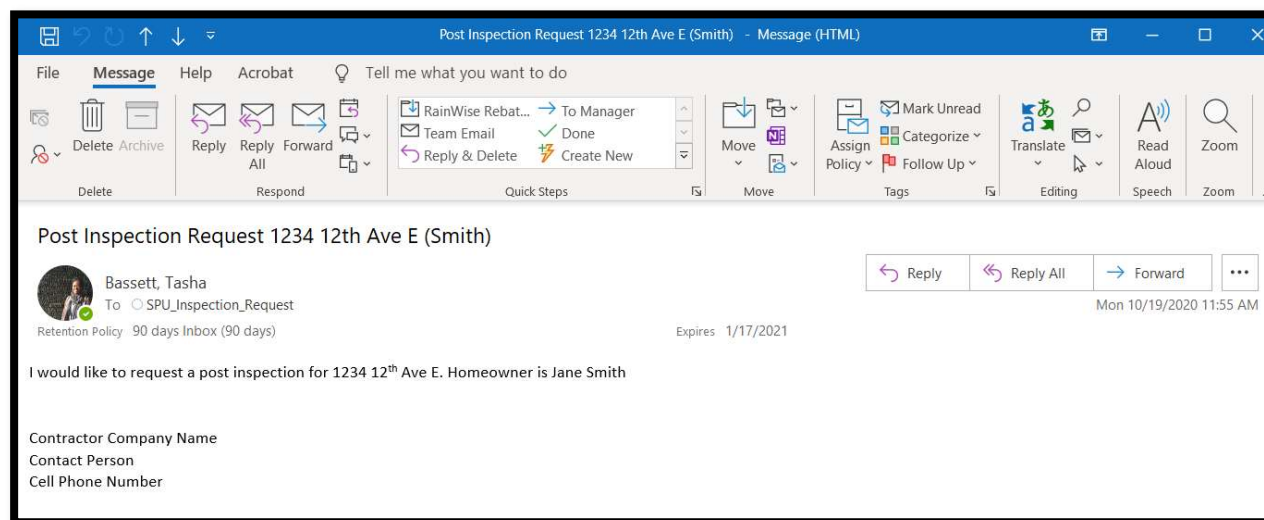


How to request a post-inspection appointment:

No documents needed unless there has been an update of the plans from the feasibility or pre inspection.

Email the inspectionrequest@seattle.gov.

☐ Please type in the email subject line: **Pre-Inspection Request at 1234 12th Ave E (Smith)**

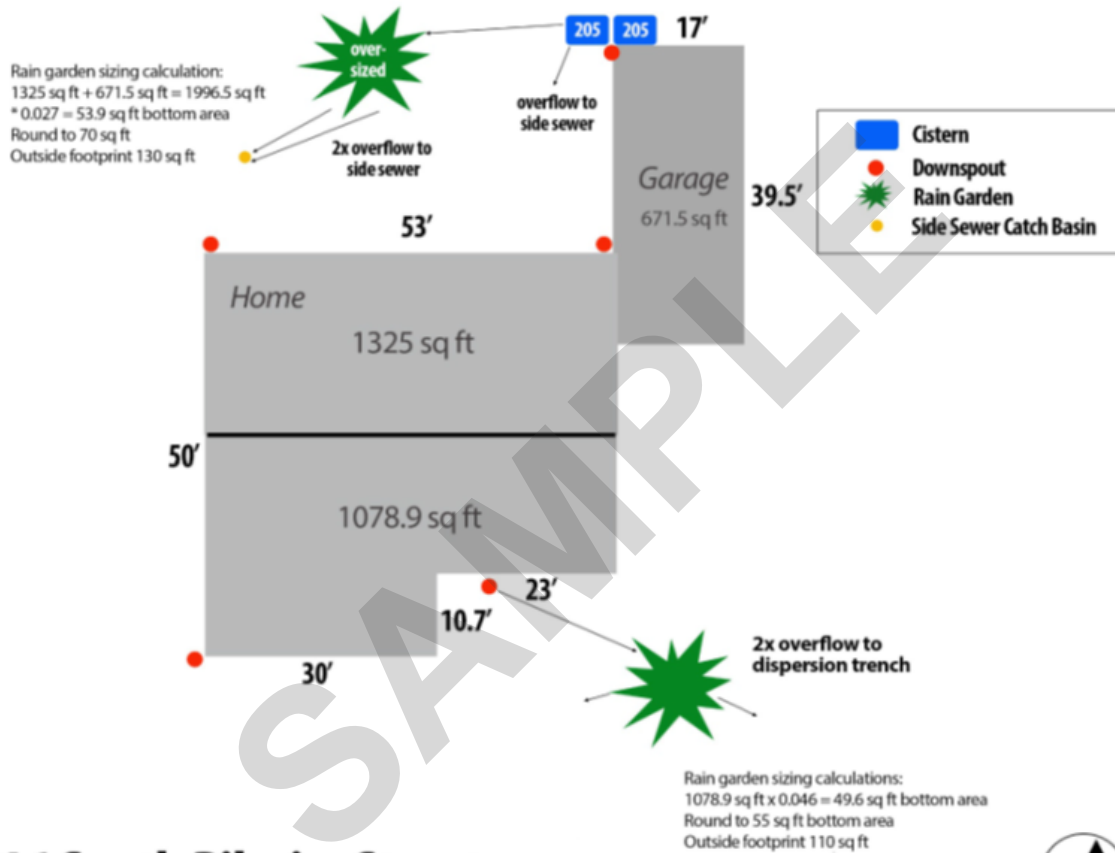


The next available inspection appointment will be made for you on a specific date and time. If you are not able to make that appointment, please “decline” the appointment and indicate why. If you can make the appointment “accept” the appointment and show up at the appointment on the specific date and time.

If for any reason, you are not able to make the appointment the day OF the appointment. Please call the inspector and email the inspectionrequest@seattle.gov to let us know.

Company Information MUST be on invoice

ABC Landscaping Company
2222 17th Ave S
Seattle, WA 98222
(206) 222-3333
abclandscaping@yahoo.com



5816 South Pilgrim Street





Invoice Cost Breakdown

Please attach this to your regular invoice as part of the rebate package. This allows you to invoice your client according to your existing billing template while allowing us to be accountable to our ratepayers.

Only items directly related to the function of a rain garden or cistern installation should be included on your invoice and this accompanying form.

Category	Description	Quantity	Rate	Total
Administration		In hours		
	Client meetings			
	Design			
	Infiltration testing			
Labor	Rain Garden related	In hours		
	Site prep			
	Construction and planting			
	Cistern related	In hours		
	Site prep/Pad construction			
	Plumbing and conveyance			
	Changes to gutters or downspouts			
Materials	Conveyance piping	Lineal feet		
	Connectors (total cost, no need for individual quantities/rates)	Number of units		
	Open conveyance (specify materials/liner/rock and note lineal feet of channel)			
	Cistern base construction materials (specify type of construction and total cost)	By type (curbed gravel, block, concrete, etc.)		
	Plants (number and size of plant materials grouped by size)	By stock size		
	Bioretention soil	Yards		
	Mulch	Yards		
	Gravel/rock	Yards		
	Cistern cost per cistern (*note, no mark up allowed on SCC supplied cisterns, you may charge actual delivery costs)	Per unit		
	Cistern plumbing connection (includes first flush diverter, low flow orifice, tank to tank connections, etc.)	Total costs no need for individual quantities/rates		
Rentals	Specify equipment	Hour/day (specify)		
Fees	Disposal fees by item (soil, clean green, etc.)	Yards		
	Delivery fees if not covered by labor(specify items, cistern, rock, etc.)			
Total				\$



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Infiltration Test & Certification

This test will help determine, 1) If soil conditions are suitable for a rain garden and 2) The size of garden.
If you have questions while executing this test, contact your contractor with questions.

Site Address: _____

(Use one certification form per rain garden.)

On-Site location (For multiple rain gardens, i.e., SW or NE): _____

Test Preparation:

- **Call before you dig!** Dial 811 for free utility pipeline location.
- Dig a hole **24 inches deep** and **at least 10 inches across**.
- Add a stake with a ruler attached and set the bottom of the ruler at the bottom of the hole. Duct tape works to attach the ruler.
- **Fill and drain the hole 2 times** to saturate the soil.
- **Each fill should be performed within 2 hours of the previous fill.**
You are mimicking the saturated condition of the soil during the rainy season.

Cautionary Note:

Any one of the following conditions **disqualify** site for a rain garden:

- * *hit hard pan soil*
- * *hole fills with water*
- * *test hole does not drain at least .25" per hour*

Infiltration Test & Certification Form: (check all boxes)

A. Upon digging hole, did you hit hard pan? (hard pan is like concrete)

Yes No

B. Upon digging hole, did the hole fill with water?

Yes No

If you answered "No" to A. and B., continue test.

1. Fill the hole (1st fill) to the **12-inch mark**. Done Not Done

2. Let the hole drain completely. Done Not Done

3. Fill the hole again (2nd fill) to the **12-inch mark**. Done Not Done

Let the hole drain completely and **record** duration of time
hole drains: Amount of time to drain: ___hrs. ___mins.

5a. Fill the hole again (3rd fill) to the **12-inch mark**. Done Not Done

5b. Record number of inches water has fallen in 1 hour: _____ inches



Be as accurate as possible!

5c. Record number of inches water has fallen **from hour 1 to hour 2:** _____ inches

If hole is already empty, refill hole (4th fill) and skip to step 5e. (use the 15 minutes table).

5d. Record next entries on appropriate table. Determine which table and interval to use, by following these guidelines. **Select appropriate interval with a check:**

>3" per hour fall, check at 15 minute intervals = Table 1

3" to 1" per hour fall, check at 30 minute intervals = Table 2

<1" per hour fall, continue to check at hourly intervals = Table 3

5e. Now measure the fall of water 3 more times on selected table below:

If hole empties prior to given time interval, refill and continue recording.

TABLE 1 (15 MINUTES)		
Time (15 min duration)	Ruler Reading (Inches)	Hole Refilled 12" (Yes or No)

TABLE 2 (30 MINUTES)		
Time (30 min duration)	Ruler Reading (Inches)	Hole Refilled 12" (Yes or No)

TABLE 3 (1 HOUR)		
Time (60 min duration)	Ruler Reading (Inches)	Hole Refilled 12" (Yes or No)

6. Contractor calculation of infiltration rate: _____ inches per hour

≥ 0.25 in/hr: use 0.25 RG size in table & replace soil with 'Bioretention' soil mix

≥ 0.5 in/hr: use 0.5 RG size in table & replace soil with 'Bioretention' soil mix

≥ 1.0 in/hr: use 1.0 RG size in table and replace soil with 'Bioretention' soil mix

> 1.0 use 1.0 in/hr RG size in table (You may not make your rain garden size smaller)

Signatures are required and must be included with your rebate materials, to be eligible for a RainWise Rebate.

I certify that I have followed the procedures outlined in this document to determine my rain garden sizing. I have chosen to size my rain garden in accordance with these results. I understand that rain gardens are sized for moderate rain events and that regardless of infiltration ability of my soil that my rain garden must have a clear and safe overflow path according to RainWise program details.

Certification Test Performed by:

Homeowner or Contractor Print Name _____

Signature _____ Date _____

Infiltration Rate Calculated by:

Contractor Print Name _____

Signature _____ Date _____

Contractor Frequently Asked Questions

1) Can I use the RainWise logo on promotional materials?

Yes, the RainWise logo is available for use by businesses with at least one person who has completed the City of Seattle's RainWise program training. It signifies that a business is a "trained" participant in the RainWise program and understands the RainWise program design specifications and procedures. Please see the RainWise Logo Guidelines document.

2) Where do I find the minimum design requirements for rain gardens and cisterns?

RainWise qualifying specifications can be found on under "Design Specifications" at https://rainwise.seattle.gov/city/seattle/contractor_corner . These are minimum specifications that provide a level of functionality appropriate to stormwater control goals. You may exceed these specifications in both performance and aesthetics if you and your client wish to, though the rebate might cover a lesser proportion of the total cost.

3) How do I update my vendor profile on the RainWise Tools website?

Visit the Contractor Registration page in the Find Contractors section of the website and request a form to update your profile.

4) Can I post pictures of my rain garden or cistern installations?

Certainly! While the functionality does not exist on the RainWise site, feel free to link to your own website from the site.

5) May I link my business website to the Rainwise Seattle websites?

Yes. Feel free to link to or promote the link to the RainWise websites.

6) May I promote my business in the target CSO basins?

Please do. While the City will do a level of outreach involving mailings, posters, and advertising related to the program, there's nothing to stop you from letting residents know about the program in any promotional efforts you may wish to undertake.

7) How long does it take SPU to send a rebate check to vendors/customers?

Rebates can take up to 8 weeks (or 60 days.)

8) Can I have the rebate check sent to me?

Yes, the Vendor Payment Option is now available. Participating property owners must sign the form in order for the rebate check to be sent directly to the contractor.

9) My customer has a basement, but also has a porch on a post and pier foundation, what should I do about setbacks?

The rain garden should be placed to meet setbacks for both types of structure. It should be the minimum 10 feet plus 2 feet for each foot the basement extends deeper than 5 feet below ground level PLUS it should be at least 5 feet away from the porch.

10) RainWise Detail Sheet 1 states that no more than 1,000 sq ft of contributing impervious surface may be directed to overflow across a sidewalk from any system. If there are 2 Rain Gardens in the front yard separated by a paved walkway into the house, is that two systems or one?

Each rain garden counts as one system and each can take 1000 SF. If the systems are both on the same side of the house, for example the front yard, their outflows must be separated by 10 feet.

11) Can the conveyance furrow from the house to the rain garden go over or under a paved walkway that runs between the house and the sidewalk?

The conveyance channel must be a direct conveyance to the receiving rain garden. Sheet flow over a sidewalk would obstruct the flow so you either have to pipe under the walkway or cut the walkway, install a rock conveyance or channel and cover with a grate, if desired.

12) I would like to use a different cistern than the 200 gallon model in table 2 of Standard Cistern to Side Sewer. How do I go about sizing and determining the rebate?

You will be calculating your sizing and rebate based on Table 7 in the sizing details (Advanced sizing tables: "Cistern Overflow to Side Sewer or Conveyance Channel"). The amount of rebate will depend on the footprint sizing of the cistern bottom area, which is based on the contributing area controlled. For example, if you were controlling 800 square feet of roof runoff, the footprint of the cistern would be 24 square feet (3% of the 800 SF contributing area). Your rebate would be 3 dollars per square foot, or 2400 dollars.

13) Can my rain garden or conveyance channel overflow to the sidewalk?

Your overflow structure, including "dispersion trench" as shown in the top figure of RainWise Detail Sheet 8A "Overflow", must be a minimum of 3 feet from a sidewalk or alley. This allows the overflow to spread out and sheet flow instead of point discharging over the sidewalk or alley.

14) Can rain chains be used instead of downspouts?

Given the cost of rain chains vs. the equivalent or better functionality of traditional downspout material, rain chains must come out of the homeowner's pocket as an aesthetic improvement/upgrade. Installation costs can be covered when one is being

installed to catch additional roof area where there is no existing downspout, but not when one is being switched out for a downspout that already exists.

15) How do I find contractors who serve specific locations?

Use the Find Contractors search tool to sort by zip code, if you want to search for contractors by area: <https://rainwise.seattle.gov/city/seattle/vendors#h-v=1827416565&p-v=1&per-v=10>. However, many RainWise contractors listed would go anywhere in Seattle for work.

16) Why is the foot print of the cistern used to determine the rebate versus the gross gallons?

In sizing the cisterns for CSO reduction, the goal is to temporarily hold the runoff and slowly release the flow through a lowflow orifice. The lower the height of water column above that orifice, the slower the water drains out of the cistern. For example the systems provide more benefit at a 3 foot height than at 4-foot maximum height. Gallonage is also a factor for the cistern credits. The square footage of the footprint is the indicator of cistern volume (gallons), while holding constant the 3-foot height. By holding constant some variable we are able to offer presized systems, allowing the program to be implemented with the staffing resources allocated to the program. Added volume above the three foot height does not offer corresponding increasing stormwater performance so we credit based on the volume that provides the core CSO reduction benefit. It's also one of the reasons we do not allow flexible bladders in RainWise installations.

17) The gallonage for listed cisterns are relatively small. Help me understand how to achieve economical solutions within your standard cistern tables for home owners who want larger capacity.

RainWise is aimed at controlling excess stormwater flows that cause CSO's. The amount of storage needed to control the target storm does not require huge amounts of storage. Our rebates are based on controlling this flow, not water conservation, so extra cost associated with large installations must be borne by the installing property as it is outside what we are trying to accomplish for our ratepayers.

18) Two of the three standard cisterns are based upon Bushman products. Help me understand how a public program like RW can be centered around the products of one manufacturer.

Our goal is to encourage the installation of as many cisterns as possible that meet design standards for our control goals. To that end the Seattle Conservation Corps is stocking a product as a convenience to our contractor partners. When surveying the possible alternatives for product that 1) was available as close to WA state as possible to keep both shipping costs and carbon footprint low 2) be an attractive alternative for residential properties, to ensure appearance was not a barrier to program participation 3) have existing fittings that met or could be adapted easily to meet program design standards 4) be installed by any reasonably competent contractor, and not require

special expertise or adaptation with an aim towards both maximizing the rebate coverage of the installation as well as maximizing the contractor base that could perform the installation. Please note that we do not require the use of our modeled “standard” cisterns.

19) If an address is eligible for "Cistern to side sewer" only does that mean they still need to do a perk test?

No, perk test are only necessary for RainWise projects that infiltrate the soil. A side sewer connection requires an additional permit, permit fee and inspection from the Department of Planning and Development. Steep slopes are the usual limiting factor for this, sometimes high water tables also limit the type of RainWise installation allowed.

20) If a property installs a cistern to rain garden, is the rebate \$3.50 total (i.e. the same as if you just installed a rain garden?)

The maximum rebate for cistern to rain garden or rain garden only is 3.50 per SF.

21) Are time and materials to move irrigation lines that are in way of a rain garden covered in the rebate program?

We would pay for the labor to install a rain garden or conveyance that might uncover irrigation lines, however we would not pay for the re-routing or for the re-installation of irrigation lines uncovered when installing a rain garden since we don't pay to re route water or gas lines. Instead we ask the contractor to re-site or have the homeowner arrange rerouting at their cost. Another example, site preparation involving the removal of part of a patio equal to the rain garden footprint would be covered. Removing the whole patio would not. Removing part of a rockery to meet the design standards is covered. Removing the whole rockery is not.

22) How long will the RainWise rebate program continue?

Through 2016.

23) There's an eligible RainWise property that backs up to Bryant Park (no alley). Can the rain garden and cistern overflow to the park? It is conveniently sloping that way.

No, overflows must be directed to the right of way. We can't direct drainage to other property, even city parks. Overflows must go to the right of way or connect to the drainage system. You could potentially install a bird cage overflow and pipe the overflow to the front yard.

This FAQ will be periodically updated and added to as additional questions arise.