

Provision E.12 Sizing Calculator Instructions

This simple Excel-based calculator facilitates iterative design calculations when completing the design of site design measures and bioretention facilities in compliance with Provision E.12 of the Phase II Municipal Stormwater Permit. See the BASMAA Post-Construction Manual for guidance on site layout, drainage, bioretention facility design.

To begin using the calculator, first divide the entire development site into Drainage Management Areas (DMAs), as described in Chapter Four of the BASMAA Post-Construction Manual. Each DMA must include only one type of surface (for example, either landscaped or impervious). There are four types of DMAs:

- Self-treating areas
- Self-retaining areas
- Areas draining to self-retaining areas
- Areas draining to a bioretention facility

For DMAs draining to self-retaining areas or to a bioretention facility, the entire DMA area must go to a single self-retaining area or bioretention facility. If the drainage within a DMA is to be divided, create a separate DMA.

The calculator is set up to handle up to 20 DMAs and 10 bioretention facilities.

The following steps are highlighted on the spreadsheet:

Step 1: Enter the total site area in square feet.

Step 2: List the name of each DMA and its area in square feet. DMA names may be changed to correspond to the labels on your Stormwater Control Plan (SCP) Exhibit.

Step 3: For self-treating and self-retaining DMAs enter (copy) the square feet of the DMA into the appropriate column. **Do not enter a runoff factor.**

Step 4: For DMAs draining to a self-retaining area or to a bioretention facility, **enter a runoff factor.** Use the factors in BASMAA Post-Construction Manual Table 4-1:

Roofs and paving	1.0
Landscaped areas	0.1
Bricks or solid pavers – grouted	1.0
Bricks or solid pavers on sand base*	0.5
Pervious concrete or asphalt*	0.0
Turfblock or gravel*	0.0
Open or porous pavers*	0.0

*See design criteria on p. 4-6 of the BASMAA Post-Construction Manual

When you enter a runoff factor, the equivalent amount of impervious area will be calculated (area * runoff factor), and the result will appear in the column for Facility 1. (The facility names may be changed to correspond to the labels on your SCP Exhibit.)

Step 5: To connect a DMA to a self-retaining area, or to a different bioretention facility, you may use your mouse to grab and slide the result from the Facility 1 column to the column for any other facility or to the “Drains to Self-Retaining Area” column. Or cut (Ctrl “X”) and paste (Ctrl “V”) the result to the new column. **Keep the result in the same row.** This capability of the calculator will allow you to “disconnect” a DMA from one facility and “connect” it to another facility so you can see how this affects minimum facility sizes.

Step 6: If in the previous step you have moved any results to the “Drains to Self-Retaining” column, enter the name of the self-retaining DMA to which flows will be directed.

Step 7: Enter the square footage of the footprint of each bioretention facility as shown on your SCP Exhibit.

Step 8: Since the bioretention facilities occupy space within a DMA, subtract the square footage of the bioretention facility footprint from the square footage shown for that DMA. (Do this in the second-to-leftmost column.) The calculator updates the minimum size of the bioretention facility. Adjust and iterate until all facility footprints are at least the minimum and the total square footage of “DMAs + Facilities” exactly equals the Total Site Area.

Step 9: If any of your DMAs drain to self-retaining areas, check that the 2:1 ratio is not exceeded. See page 4-2 of the BASMAA Post-Construction Manual.

Step 10: As a final check, review the square footage for each DMA and each bioretention facility and confirm it is consistent with what is shown on your SCP Exhibit.