

## **Flow Chart for Projects Required to Meet Runoff Retention Performance Requirements**

For projects  $\geq 15,000$  ft<sup>2</sup> in WMZs requiring retention of 85<sup>th</sup> or 95<sup>th</sup> percentile 24-hr rainfall event

The attached flow chart is intended to illustrate the process for using an event-based approach to sizing structural Stormwater Control Measures (SCMs) for projects where an 85<sup>th</sup> or 95<sup>th</sup> percentile 24-hr rainfall event Runoff Retention requirement applies. Numbered items correspond to elements of the flow chart. The flow chart follows the LID Development Standards of the Post-Construction Requirements and specific sections of the requirements are identified in parentheses.

### **① Site Design and Runoff Reduction**

- The determination of whether structural SCMs are necessary for a project is based on the outcome of site design and the selection of onsite runoff reduction measures. The process begins with Site Assessment, including identification of constraints that may support later determinations of technical infeasibility for infiltration (B.4.d.i.). The goal of Site Design is to optimize use of LID site design measures, as feasible and appropriate at the project site (B.4.d.ii.).
- Delineating Drainage Management Areas is an essential step in achieving the LID design objective of distributed facilities, as opposed to centralized facilities where runoff from a large site is collected in a single location (B.4.d.iii.).
- Site design should include selection of Runoff Reduction measures to reduce the amount of runoff from each Drainage Management Area for which structural retention and treatment will be needed (B.4.d.iv.2).

### **② Still have runoff?**

- Some initial runoff calculations will be helpful in determining whether site design and runoff reduction have maximized runoff reduction within each Drainage Management Area. Such calculations will support an iterative approach to site design and selection of runoff reduction measures.
- Depending on site conditions, there may be no need for structural SCMs (e.g., impervious surfaces runoff to large portion of site with highly infiltrative soils and/or with a high demand for irrigation (e.g., orchard)). If the project generates no runoff from the site and this can be quantifiably demonstrated, the project has met the Runoff Retention Performance Requirement. However, in most cases structural SCMs will be needed.

### **③ Start process to select and size Structural SCMs**

- Where structural SCMs are needed, first determine the applicable rainfall depth of the 85<sup>th</sup> or 95<sup>th</sup> percentile 24-hr rainfall event, whichever is indicated for the Watershed Management Zone in which the Regulated Project is located (B.4.c.i - B.4.c.iv). Also

identify any adjustments to retention volumes that may be applied in subsequent runoff calculations. For example, SCM size should be based only on half the runoff from replaced impervious surfaces in typical redevelopment projects.

- The Project Applicant may size SCMs using continuous simulation modeling, **OR** the methods described in Attachment D of the Post-Construction Requirements. However, if continuous simulation modeling is used, use it only to size SCMs to retain runoff from the applicable rainfall depth, not to estimate predevelopment runoff.

**④ Attachment D to Size SCMs:**

- Attachment D provides the option of two methods for determining SCM size: Simple Method **OR** Routing Method. Regardless of which method is selected, the first steps are to Determine Retention Tributary Area and Calculate Retention Volume.
- Retention Tributary Area should be calculated for each individual Drainage Management Area to size the SCM receiving runoff from that Drainage Management Area. For Drainage Management Areas that contain them, undisturbed and natural landscape areas (B.4.d.iv.) must be accounted for in the Retention Tributary Area calculation. The Retention Tributary Area must also account for any adjustments to Performance Requirement No. 3 (e.g., count only 50% of replaced impervious surfaces per B.4.b.i).
- Calculate Retention Volume for 85<sup>th</sup> or 95<sup>th</sup> percentile 24-hr rainfall depth for each Drainage Management Area using the appropriate equations in section 2.d of Attachment D.

**⑤ Do site SCMs infiltrate, evapotranspire, or retain through storage the entire retention volume?**

- SCMs sized using Attachment D should infiltrate and/or evapotranspire the Retention Volume or, provide sufficient Capture Volume to retain the Retention Volume, as these terms are defined in Attachment D.
- SCMs sized using continuous simulation modeling may use different terms, but should demonstrate the same capacity to infiltrate, evapotranspire, or retain through storage the entire runoff volume generated by the applicable 85<sup>th</sup> or 95<sup>th</sup> percentile 24-hr rain.
- Where the answer is YES, a final determination on Water Quality Treatment is made (see 7 below).
- Where the answer is NO, final determinations on Water Quality Treatment AND Technical Feasibility (see below) are necessary.

**⑥ Technical Infeasibility:**

- Constraints such as high groundwater, soil types that significantly limit infiltration, geotechnical hazards, or space constraints may restrict the site's ability to retain runoff.
- Where the site SCMs do not retain the entire retention volume, and the applicant can demonstrate technical infeasibility, the applicant should submit a site-specific hydrologic and/or design analysis conducted and endorsed by a registered professional

engineer, geologist, architect, and/or landscape architect, demonstrating that compliance with the numeric requirement is technically infeasible (C.1.a. , c.).

- Where the applicant cannot demonstrate technical infeasibility, they must go back and redesign their site and SCMs to retain the entire retention volume, or demonstrate infeasibility to qualify for off-site mitigation.
- off-site retention requirements (B.4.e.ii.).
- Where the applicant demonstrates technical infeasibility and dedicates area on site equal to 10% of Equivalent Impervious Surface Area to retention-based structural SCMs, such as bioretention facilities and pervious pavements, the applicant has no further retention requirements (B.4.e.). (Use Attachment E to calculate Equivalent Impervious Surface Area.)
- Where the applicant demonstrates technical infeasibility but does not dedicate area on site equal to 10% of Equivalent Impervious Surface Area to retention-based structural SCMs, the applicant has the option to mitigate offsite (B.4.e.). (Use Attachment F to calculate the off-site retention requirements).
- While the Post-Construction Requirements do not specify a design volume for retention-based structural SCMs within the 10% area, selection of retention-based SCMs should optimize infiltration.
- Where the applicant has demonstrated technical infeasibility, but dedicates an area less than 10% of Equivalent Impervious Surface Area to retention-based structural SCMs, the project has off-site retention requirements (B.4.e.ii.). (Use Attachment F to calculate the off-site retention requirements).

#### ⑦ Water Quality Treatment Performance Requirement No. 2

- On-site infiltration of all runoff from the 85<sup>th</sup> percentile 24-hr rainfall event would comply with Water Quality Treatment Performance Requirement No. 2. However, SCMs designed through the preceding steps may rely on lesser amounts of infiltration and achieve varying levels of runoff treatment effectiveness. For this reason, the Project Applicant must demonstrate that volume- or flow-based water quality treatment standards are met by the SCMs sized per the above steps, or by additional treatment-based SCMs.

