

Detention Basins

Multi-Benefit Full Capture Systems

June 2023

This information sheet generically describes the categorically certified Detention Multi-Benefit Full Capture Systems and the associated specific design requirements.



Photograph of a Typical Detention Multi-Benefit Trash Treatment System

Description

Detention Basin Multi-Benefit Full Capture Systems (Detention Basins) remove pollutants from stormwater runoff in a holding area that either permanently or temporarily stores stormwater flows to reduce flooding potential (see photograph above). Detention Basins are also known as dry ponds, holding ponds, retarding basins, or dry detention basins. These are typically topographical depressions and may include an underground system of pipes, chambers, concrete vaults, or similar void structures designed to store water. Detention Basins incorporate filtration through media or infiltration to underlying soils. Detention Basins also include wet retention basins designed to contain water on its surface year-round.

Multi-Benefit Certification Limitations

The following systems must be individually certified through the State Water Board's Full Capture System certification process, regardless of whether they otherwise meet the conditions of this certification:

- Pre-manufactured systems (i.e., those manufactured off-site that are generally available for sale); and
- Systems that are designed to contain water for more than 96 hours after conclusion of a storm event in an underground system of pipes, chambers, concrete vaults, or similar void structures connected to exterior inlets or outlets.

Performance, Design, and Maintenance

Permittees and other responsible entities¹ I shall design, construct, and maintain **Detention Basins** in accordance with the following six (6) requirements:

1. Detention Basins shall trap particles that are 5 millimeters or greater at any time during a storm event for the following:
 - a. The peak flow rate generated by the region specific 1-year, 1-hour storm event from the applicable sub-drainage area; or
 - b. The peak flow rate of the corresponding storm drain (if the Bioretention System is designed to treat flows from the corresponding storm drain that is designed for less than the peak flow rate generated from a 1-year, 1-hour storm event).
2. Detention Basins may include either or both of the following to trap particles for either flow described above in section 1.a or 1.b:
 - a. A screen at the system's inlet, overflow, or bypass outlet; or
 - b. An up-gradient structure designed to bypass flows exceeding the flows as described in section 1.a or 1.b²
3. The peak flow rates referenced in section 1.a, above, shall be calculated using one of the following methods:

¹ These requirements also apply to any entity designing a Detention Basin to comply with a Water Board permit or a permittee's requirements implementing the Trash Provisions.

² Upon approval by the appropriate Regional Water Quality Control Board Executive Officer, a 5 millimeter screen and/or upgradient structure may not be required if the Detention Basin is designed for flood control from flows generated by very large storm events.

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- a. For small drainage areas (generally less than 50 acres) – The Rational equation method which is expressed as $Q = CIA$ where:

Q = design flow rate (cubic feet per second)

C = runoff coefficient (dimensionless)

I = design rainfall intensity (as determined per the rainfall isohyetal map specific for each region) specific to each region, inches/hour

A = subdrainage area (acres)

- b. For large drainage areas (generally more than 50 acres or more) – Other accepted hydrologic mathematical methods that more accurately calculate peak flow rates from large drainage areas.
4. For Detention Basins that incorporate groundwater recharge capacity into the sizing of the Detention Basin for the purpose of requirements related to the peak flow rates in item 1, above, the percolation rate below the Detention Basin must either be measured directly or estimated employing conservative hydrogeologic assumptions.
 5. A registered California licensed Professional Engineer shall stamp and sign the Detention Basin design plans as required by California Business & Professions Code section 6700, et seq.
 6. Because regular maintenance is required to maintain adequate trash capture capacity and to ensure that captured trash does not migrate offsite, the Permittee shall establish a maintenance schedule based on:
 - a. The maintenance frequency as required in the applicable State or Regional Water Board stormwater permit; and,
 - b. Site-specific factors including the design trash capture capacity of the Detention Basin, local storm frequency, and characterization of trash and vegetation accumulation in the corresponding sub-drainage area.