Bioretention

Multi-Benefit Trash Treatment Systems

Figure A: CSU-Sacramento Bioretention BMP

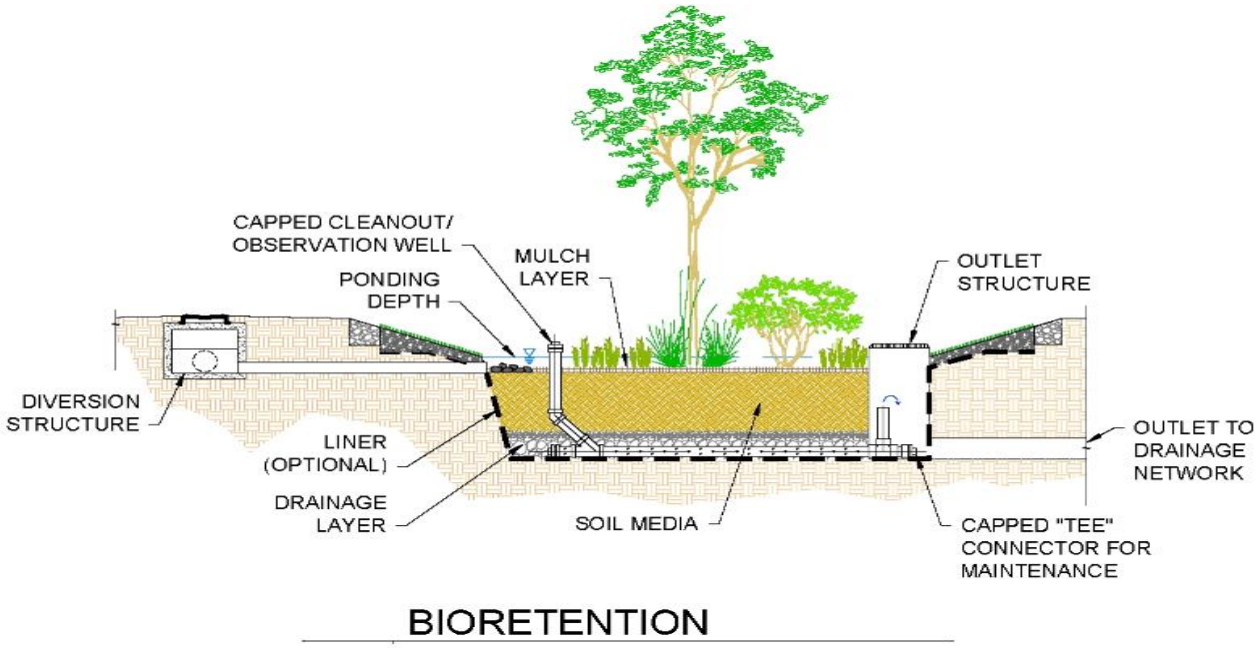

Figure B. Tetra Tech / CASQA

Description

Bioretention Multi-Benefit Trash Treatment Systems come in various shapes and sizes that remove pollutants from stormwater runoff. A physical filtration occurs as stormwater passes through a sequence of media layers. The treatment area consists of a ponding layer, a vegetated and mulched layer, an engineered soil layer, and a supporting bed layer of sand or gravel. Stormwater entering the treatment area evapotranspires or gradually passes through the mulch/soil/gravel layers where it then infiltrates into native soil or collects in an underdrain that conveys to a discharge point. Wet ponds or wetlands are not eligible for certification as Bioretention Multi-Benefit Trash Treatment Systems.

Certified Bioretention Multi-Benefit Trash Treatment Systems must be designed in accordance with the following five (5) requirements:

Performance, Design, and Maintenance

1. Bioretention Multi-Benefit Trash Treatment Systems shall be designed and maintained to trap trash particles that are 5-mm or greater for the following:[1]
   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 corresponding storm drain is designed for less than the peak flow rate generated from a 1-year, 1-hour storm event).
2. Bioretention Multi-Benefit Trash Treatment Systems may include either or both of the following to trap trash 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 described above in section 1.a or 1.b.[2]
3. The peak flow rates referenced in section 1.a, above, shall be calculated using one of the following methods:
   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 to each region, inches/hour; and
      A = subdrainage area, in acres.
   b. For large drainage areas (~50 acres or more) - Other accepted hydrologic mathematical methods that more accurately calculate peak flow rates from large drainage areas.
4. The Bioretention Multi-Benefit Trash Treatment System Design shall be stamped and signed by a registered California licensed Professional Engineer as required by California Business & Profession Code section 6700, et seq.
5. Regular maintenance is required to maintain adequate trash capture capacity and to ensure that captured trash does not migrate offsite. The owner shall establish a maintenance schedule based on site-specific factors, including the design trash capacity of the Bioretention Multi-Benefit Trash Treatment System, storm frequency, and estimated or measured trash loading from the drainage area.

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1 Certified full capture devices have a design capacity to trap trash from flows not less than the peak flow rate at any time within a storm event. A Multi-benefit trash treatment system, including those that are volume-based, must have a design capacity to trap trash from flows not less than the peak flow rate at any time within a storm event to be a certified full capture system.

2 Upon approval by the appropriate Regional Water Quality Control Board Executive Officer, a 5mm screen and/or upgradient structure may not be required if the multi-benefit trash treatment system is designed for flows generated from very large 24-hour storm events.