

Bioswale Design Standards

Each development shall be responsible for providing stormwater quality best management practices. Stormwater runoff from all impervious surfaces shall be directed through a treatment device. Bioswales designed to the following standards are an approved treatment device.

The design flow rate shall be calculated using: $Q = C * I * A$

Where:

- The design rainfall rate "I" is 0.20 inches per hour.
- The runoff coefficient "C" is 0.95 for impervious surfaces and 0.30 for pervious surfaces.
- The area is in acres and is measured from the site plan.

The peak flow rate is conveyed in a bioswale with the following characteristics:

- The maximum depth for the design treatment flow rate is 4-inches deep.
- Use a Manning's Coefficient of 0.250
- Side slopes are 3:1 H: V.
- The minimum slope is 0.5 percent.

Calculate the flow velocity based on the above criteria.

The bioswale length is the flow velocity in feet per second * 540 seconds (9 minutes).

Check the bioswale for water level during a 100-year storm event.

Two Options:

1. Provide flow capacity in bioswale.
2. Provide storm drain system that collects flows in excess of Water Quality Storm runoff rate.

For Option 1:

The 100-year flow rate shall be calculated using: $Q = C * I * A$

Where:

- The runoff coefficient "C" is 0.95 for impervious surfaces and 0.40 for pervious surfaces.
- The area is in acres and is measured from the site plan.

The bioswale shall convey the 100-year flow event.

The Manning's Coefficient for the 100-year flow is from the attached Table:

The maximum flow velocity is 5 feet per second. If a higher velocity is calculated, split the swale into smaller segments and reduce the inflow area accordingly.

The required freeboard is Depth of Flow * 0.25.

At bends, provide additional freeboard allowance is based on the superelevation equation:

$$\text{Additional freeboard (feet)} = \frac{100\text{-year Velocity (fps)}^2 * 100\text{-yr Top Width (feet)}}{\text{Gravity (32.2 ft/sec}^2) * \text{Centerline radius of curvature (feet)}}$$

Asphalt adjacent to a bioswale shall be protected. The Geotechnical Report shall advise on an appropriate protection. Typically, a concrete cutoff wall or 5 mil impervious geofabric that extends to the bottom of the pavement section can be used.

Planting within the bioswale shall meet current Regional Water Control Board and San Mateo County standards. A seed mix shall be provided on the Improvement Plans. The seed mix shall be placed as a part of a three-step procedure that includes tackifier, straw and fertilizer.

DRAFT STORM WATER STANDARDS

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