



Description

Flow-through planters are structural landscaped reservoirs that collect stormwater and filter out pollutants as the water percolates through the vegetation, growing medium and gravel. These are appropriate where soils do not drain well or there are site constraints. A liner may be required when located adjacent to buildings, over contaminated soils and on unstable slopes. Excess stormwater collects in a perforated pipe at the bottom of the flow-through planter and drains to an approved discharge point.

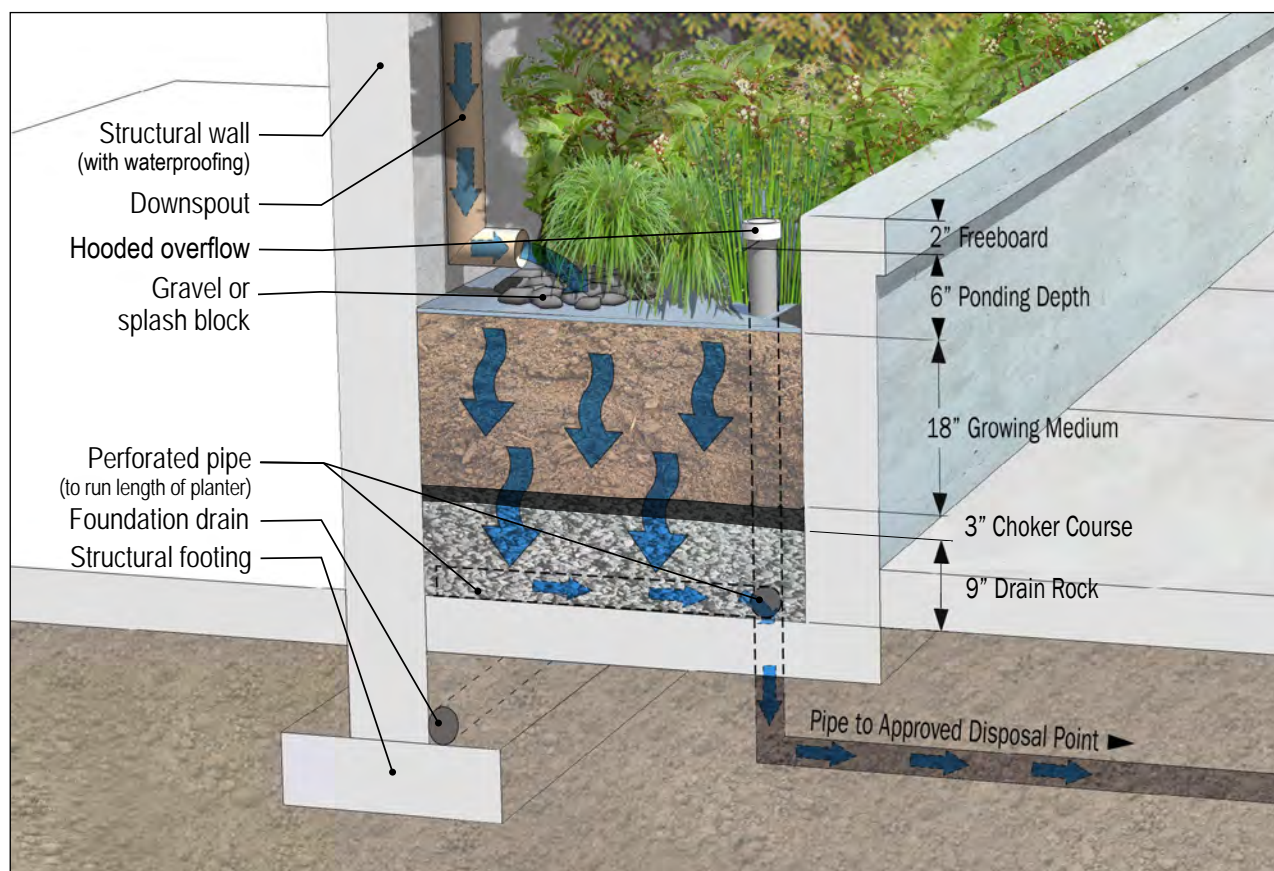
Tree box filters are flow-through planters with a concrete “box” that contains filtering growing media and a tree or large shrub. Tree box filters are used singly or in multiples, often adjacent to streets where runoff is directed to them to treat stormwater runoff before it enters a catch basin.

Application & Limitations

Flow-through planters may help fulfill a site’s landscaping area requirement and can be used to manage stormwater runoff from all types of impervious surfaces on private property and within the public right-of-way. Check with the local jurisdiction if proposing to use a flow-through planter in the public right-of-way. Flow-through planters can be placed next to buildings and are ideal for sites with poorly draining soils, steep slopes or other constraints. Design variations of shape, wall treatment and planting scheme will fit the character of any site.



Headwaters at Tryon Creek, Portland



Design Factors

Sizing

To calculate the planter size, multiply the impervious surface (rooftops, driveways, parking lots, etc.) area by 6%. The square footage is the peak water surface prior to overflow. For example, a 1,200-sf rooftop and 300-sf driveway (1,500 sf total impervious area) requires a 90-sf stormwater planter (1,500 x 0.06). This could be accomplished with one 9-foot by 10-foot flow-through planter. Note, pretreatment is required for any contributing impervious area greater than 15,000 sf.

Geometry/Slopes

- Stormwater planters may be any shape, and can be designed as square, rectangular, circular, oblong or irregular.
- Regardless of the shape, a minimum planter width of 30 inches is needed to achieve sufficient time for treatment and to avoid short-circuiting.
- The minimum treatment depth of 18 inches is achieved in the growing medium.
- Planters are designed to evenly distribute and filter flows. Surface longitudinal slopes should be less than 0.5%.

Piping for Flow-Through Planters

Follow Plumbing Code requirements for piping that directs stormwater from impervious surfaces to flow-through planters. Stormwater may flow directly from the public street right-of-way or adjacent parking lot areas via curb openings. The overflow drain allows not more than six inches of water to pond in the planter prior to overflow. A perforated pipe system under the planter drains water that has filtered through the topsoil to prevent long-term ponding. On private property, the overflow drain and piping must meet Plumbing Code requirements and direct excess and filtered stormwater to an approved disposal point. Check with the local jurisdiction or use Clean Water Services Design and Construction Standards for additional information on piping material for use in the public right-of-way.

Setbacks

Check with the local building department to confirm site-specific requirements.

- For planters without an impermeable liner, generally the minimum setback from building structures is 10 feet.



PSU Stephen Epler Hall, Portland



RiverEast Center, SE Portland

Design Factors (continued)

- Typically, no building setback is required for planters lined with waterproofed concrete or 60 mil. PVC liner to prevent infiltration.

Soil Amendment/Mulch

Amended soils with appropriate compost and sand provide numerous benefits: infiltration; detention; retention; better plant establishment and growth; reduced summer irrigation needs; reduced fertilizer need; increased physical/chemical/microbial pollution reduction; and, reduced erosion potential. Primary treatment will occur in the top 18 inch flow-through planter. Amended soil in the treatment area is composed of organic compost, gravelly sand and topsoil. Compost is weed-free, decomposed, non-woody plant material; animal waste is not allowed. Check with the local jurisdiction or Clean Water Services for Seal of Testing Approval Program (STA) Compost provider.

To avoid erosion, use approved erosion control BMPs for flow-through planters.

Vegetation

Planted vegetation helps to attenuate stormwater flows and break down pollutants by interactions with bacteria, fungi, and other organisms in the planter soil. Vegetation also

traps sediments, reduces erosion, and limits the spread of weeds. Appropriate, carefully selected plantings enhance the aesthetic and habitat value. For a complete list of allowable plants refer to page 76.

The entire water quality treatment area should be planted appropriately for the soil conditions.

Because the entire facility will be inundated periodically, plant the water quality treatment area with herbaceous species such as rushes sedges, perennials, ferns appropriate for wet-to-moist soil conditions. Most moisture-tolerant plants can withstand seasonal droughts during the dry summer months and do not need irrigation after they become established.

Native plants are encouraged, but non-invasive ornamentals that add aesthetic and functional value are acceptable upon approval from local jurisdiction. All vegetation should be planted densely and evenly to ensure proper hydrological function of the flow-through planter.

Quantities per 100 square feet:

- 115 herbaceous plants, 1' on center spacing, 6" or ½-gal container size; or
- 100 herbaceous plants, 1' on center, and 4 shrubs, 1-gal container size 2' on center.



Rose Quarter parking structure, NE Portland



Washougal Town Square



Aloha Dog and Cat Clinic, Washington County



Buckman Terrace Apartments, Portland

Required Maintenance Period

- Water-efficient irrigation should be applied for the first two years after construction of the facility, particularly during the dry summer months, while plantings become established. Irrigation after these two years is at the discretion of the owner.
- If public, the permittee is responsible for the maintenance of the flow-through planter for a minimum of two years following construction and acceptance of the facility.

Long-Term Maintenance

If private, the property owner will be responsible for ongoing maintenance per a recorded maintenance agreement (see page 88 for example maintenance agreement).

For detailed Operation and Maintenance Plans that describe proper maintenance activities please refer to page 91.

All publicly maintained facilities not located in the public right-of-way must have a public easement to ensure access for maintenance.

References

Clean Water Services Design and Construction Standards