Runoff Model Representation

Roof areas served by downspouts that drain to infiltration dry wells or infiltration trenches that are sized in accordance with the guidance in this BMP do not have to be entered into the runoff model. They are presumed to fully infiltrate the roof runoff.

BMP T5.10B: Downspout Dispersion Systems

Downspout dispersion systems are splash blocks or gravel filled trenches, which serve to spread roof runoff over vegetated pervious areas. Dispersion attenuates peak flows by slowing the runoff entering into the conveyance system, allowing some infiltration, and providing some water quality benefits.

Design Criteria

1. Use downspout trenches designed as shown in Figure V-4.4: Typical Downspout Dispersion Trench and Figure V-4.5: Standard Dispersion Trench with Notched Grade Board for all downspout dispersion applications except where splash blocks are allowed below.
2. Splash blocks shown in Figure V-4.6: Typical Downspout Splashblock Dispersion may be used for downspouts discharging to a vegetated flow path at least 50 feet in length as measured from the downspout to the downstream property line, structure, slope over 15%, stream, wetland, or other impervious surface. Sensitive area buffers may count toward flow path lengths.
3. The vegetated flow path must consist of well-established lawn or pasture, landscaping with well-established groundcover , native vegetation with natural groundcover, or an area that meets BMP T5.13: Post-Construction Soil Quality and Depth. The groundcover shall be dense enough to help disperse and infiltrate flows and to prevent erosion.
4. If the vegetated flow path (measured as defined above) is less than 25 feet, BMP T5.10C: Perforated Stub-out Connections may be used in lieu of downspout dispersion. BMP T5.10C: Perforated Stub-out Connections may also be used where implementation of downspout dispersion might cause erosion or flooding problems, either on site or on adjacent lots. For example, this provision might be appropriate for lots constructed on steep hills where downspout discharge could culminate and might pose a potential hazard for lower lying lots, or where dispersed flows could create problems for adjacent off-site lots. This provision does not apply to situations where lots are flat and on-site downspout dispersal would result in saturated yards.

   Note: For all other types of projects, the use of a perforated stub-out in lieu of downspout dispersion shall be as determined by the Local Plan Approval Authority.
5. For sites with septic systems, the discharge point of all dispersion systems must be downslope of the primary and reserve drainfield areas. This requirement may be waived if site topography clearly prohibits flows from intersecting the drainfield or where site conditions (soil permeability, distance between systems, etc.) indicate that this is unnecessary.
6. No erosion or flooding of downstream properties may result.

7. For purposes of maintaining adequate separation of flows discharged from adjacent dispersion devices, the vegetated flowpath segment for the splashblock (or the outer edge of the vegetated flowpath segment for the dispersion trench) must not overlap with other flowpath segments, except those associated with sheet flow from a non-native pervious surface.

8. Have a geotechnical engineer or a licensed geologist, hydrogeologist, or engineering geologist evaluate runoff discharged towards landslide hazard areas. Do not place the discharge point from splashblocks or dispersion trenches on or above slopes greater than 15% or above erosion hazard areas without evaluation by a licensed engineer in the state of Washington with geotechnical expertise or a licensed geologist, hydrogeologist, or engineering geologist, and approval by the Local Plan Approval Authority.

Design Criteria for Dispersion Trenches

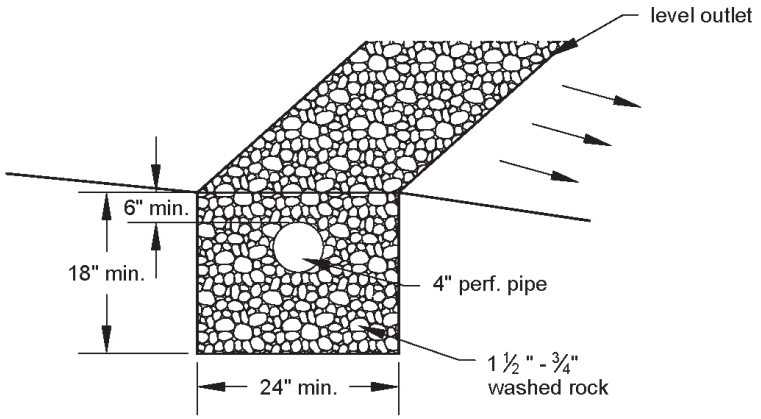
1. A vegetated flow path of at least 25 feet in length must be maintained between the outlet of the dispersion trench and any property line, structure, stream, wetland, or impervious surface. A vegetated flow path of at least 50 feet in length must be maintained between the outlet of the trench and any slope steeper than 15%. Sensitive area buffers may count towards flow path lengths.

2. Trenches serving up to 700 square feet of roof area may be 10-foot-long by 2-foot wide gravel filled trenches as shown in Figure V-4.4: Typical Downspout Dispersion Trench.

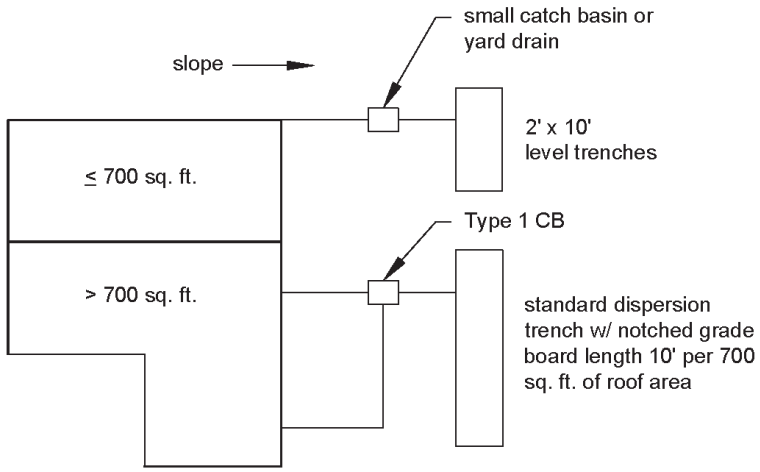
   For roof areas larger than 700 square feet, a dispersion trench with notched grade board as shown in Figure V-4.5: Standard Dispersion Trench with Notched Grade Board or alternative material approved by the Local Plan Approval Authority may be used. The total trench length must not exceed 50 feet and must provide at least 10 feet of trench length per 700 square feet of roof area.

3. Maintain a setback of at least 5 feet between any edge of the trench and any structure or property line.

Figure V-4.4: Typical Downspout Dispersion Trench



Trench X-Section



Plan View of Roof

Source: King County Department of Natural Resources, 1998

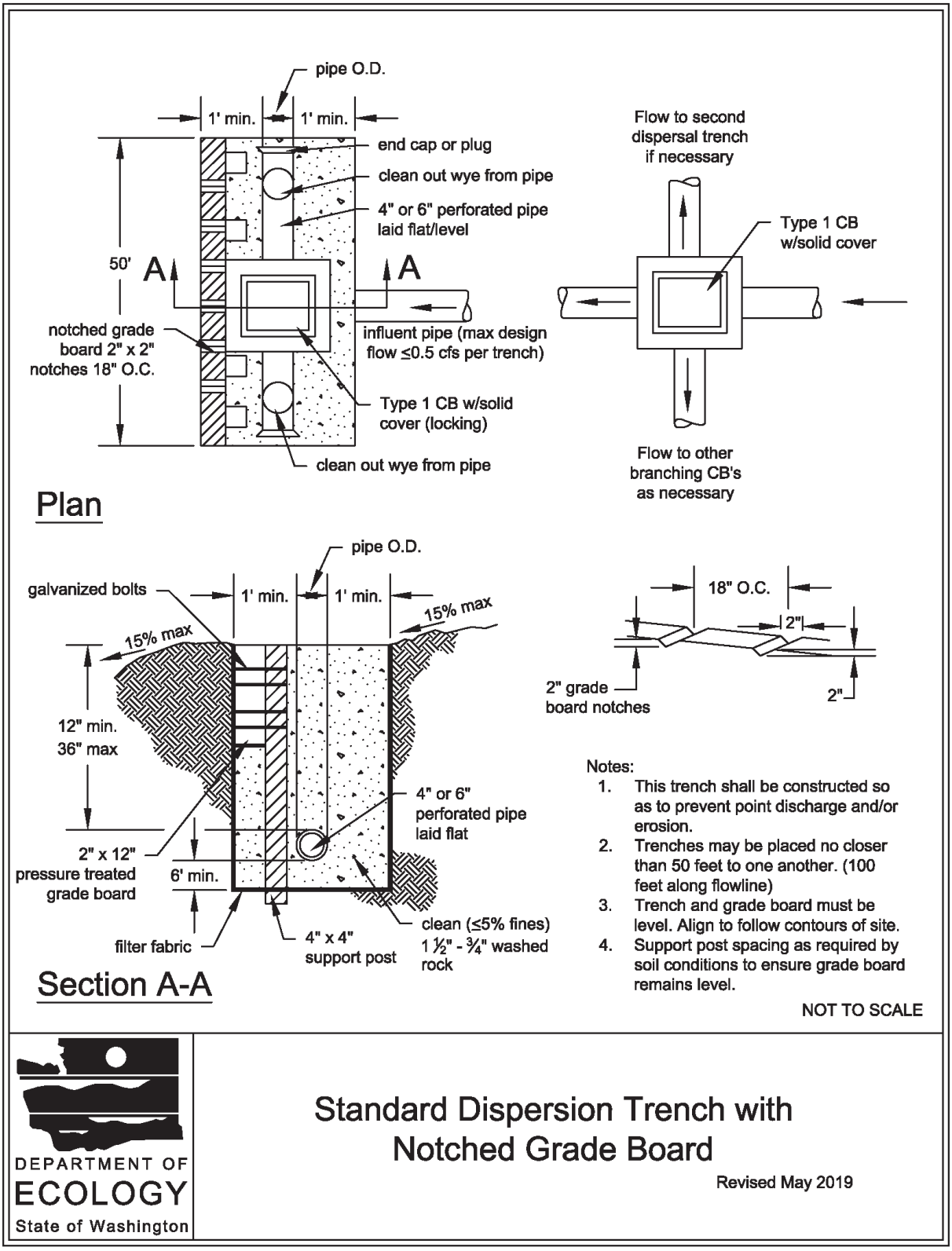
NOT TO SCALE

DEPARTMENT OF ECOLOGY
State of Washington

Typical Downspout Dispersion Trench

Revised December 2016

Figure V-4.5: Standard Dispersion Trench with Notched Grade Board



Design Criteria for Splashblocks

A typical downspout splashblock is shown in Figure V-4.6: Typical Downspout Splashblock Dispersion. In general, if the ground is sloped away from the foundation and there is adequate vegetation and area for effective dispersion, splashblocks will adequately disperse storm runoff. If the ground is fairly level, if the structure includes a basement, or if foundation drains are proposed, splashblocks with downspout extensions may be a better choice because the discharge point is moved away from the foundation. Downspout extensions can include piping to a splashblock/discharge point a considerable distance from the downspout, as long as the runoff can travel through a well-vegetated area as described below.

The following apply to the use of splashblocks:

1. Maintain a vegetated flow path of at least 50 feet between the discharge point and any property line, structure, slope steeper than 15%, stream, wetland, lake, or other impervious surface. Sensitive area buffers may count toward flow path lengths.
2. A maximum of 700 square feet of roof area may drain to each splashblock.
3. Place a splashblock or a pad of crushed rock (2 feet wide by 3 feet long by 6 inches deep) at each downspout discharge point.

Figure V-4.6: Typical Downspout Splashblock Dispersion