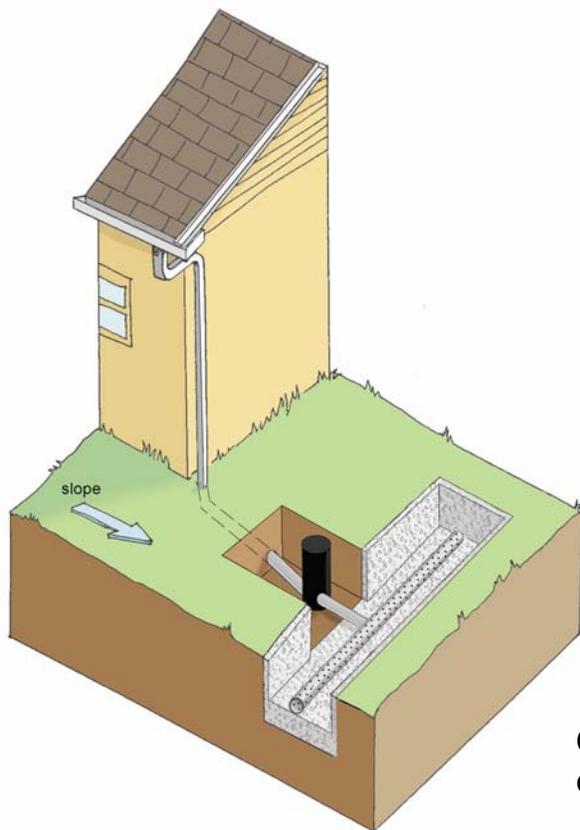


## BMP T5.10 – Downspout Dispersion

Dispersion trenches and splash blocks spread runoff across grass if you add soil amendment (see BMP T5.13), where it can infiltrate back into the ground. This minimizes erosion and replenishes groundwater and summertime stream flows.



Typical downspout dispersion to vegetated flowpath



Cut-away view of dispersion trench

Revised 4/18/12



Community Development  
 1300 Franklin Street, Vancouver, Washington  
 Phone: (360) 397-2375 Fax: (360) 397-2011  
[www.clark.wa.gov/development](http://www.clark.wa.gov/development)



For an alternate format, contact the Clark County ADA Compliance Office.  
 Phone: (360) 397-2322  
 Relay: 711 or (800) 833-6384  
 E-mail: ADA@clark.wa.gov

## BMP T5.10 – Downspout Dispersion

### Purpose and Definition

Downspout dispersion BMPs are splashblocks or gravel-filled trenches that serve to spread roof runoff over vegetated pervious areas. Dispersion attenuates peak flows by slowing entry of the runoff into the conveyance system, allows for some infiltration, and provides some water quality benefits.

### Applications and Limitations

- Downspout dispersion is required on all subdivision single family lots which meet one of the following criteria:
  1. Lots greater than or equal to 22,000 square feet where downspout infiltration is not being provided according to the requirements in Volume III, Chapter 3.
  2. Lots smaller than 22,000 square feet where soils are not suitable for downspout infiltration as determined in Volume III, Chapter 3 and where the design criteria below can be met.
- All other projects required to apply Roof Downspout BMPs must provide downspout dispersion if downspout infiltration is not feasible or applicable as determined in Volume III, Chapter 3, and if the design criteria below can be met.

### Flow Credit for Roof Downspout Dispersion

If roof runoff is dispersed according to the requirements of this section on single-family lots greater than 22,000 square feet, and the *vegetative flowpath\** is 50 feet or larger through undisturbed native landscape or lawn/landscape area that meets BMP T5.13, the designer may click on the “Credits” button in the WWHM and enter the percent of roof area that is being dispersed.

### General Design Guidelines

- Dispersion trenches designed as shown in the Figures 5.1 and 5.2 shall

be used for all downspout dispersion applications except where splashblocks are allowed below. See Figure 5.3 for a typical splashblock.

- Splashblocks may be used for downspouts discharging to a vegetated flowpath at least 50 feet in length as measured from the downspout to the downstream property line, structure, sensitive steep slope, stream, wetland, or other impervious surface. Sensitive area buffers may count toward flowpath lengths. The vegetated flowpath must be covered with well-established lawn or pasture, landscaping with well established groundcover, or native vegetation with natural groundcover. The groundcover shall be dense enough to help disperse and infiltrate flows and to prevent erosion.
- If the vegetated flowpath (measured as defined above) is less than 25 feet on a subdivision single-family lot, a perforated stub-out connection may be used in lieu of downspout dispersion (See Volume III, Chapter 3). A perforated stub-out may also be used where implementation of downspout dispersion might cause erosion or flooding problems, either on site or on adjacent lots. This provision might be appropriate, for example, for lots constructed on steep hills where downspout discharge could be cumulative and might pose a potential hazard for lower lying lots, or where dispersed flows could create problems for adjacent offsite lots. This provision does not apply to situations where lots are flat and onsite 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.

\* *Vegetative flow path* is measured from the downspout or dispersion system discharge point to the downstream

property line, stream, wetland, or other impervious surface.

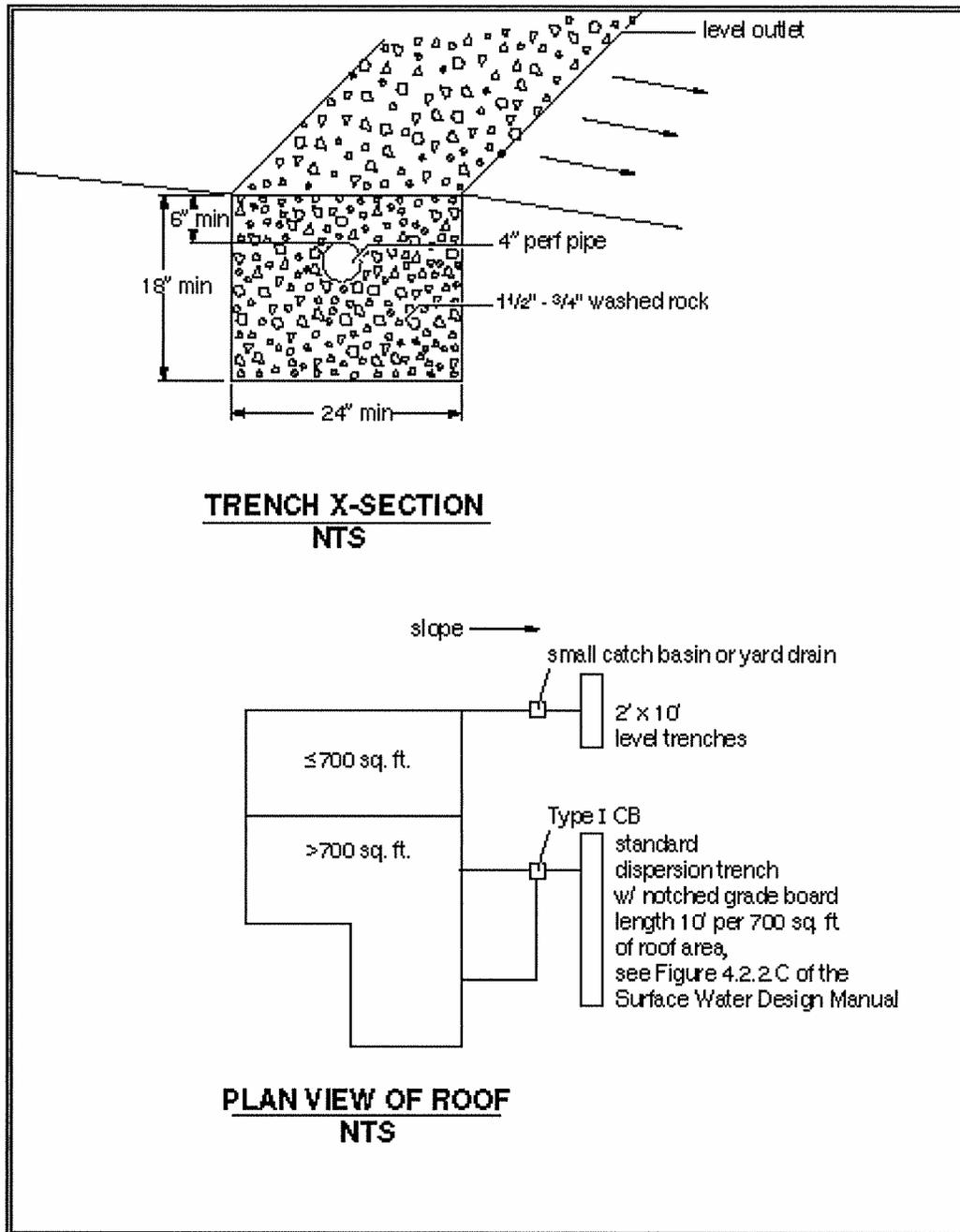
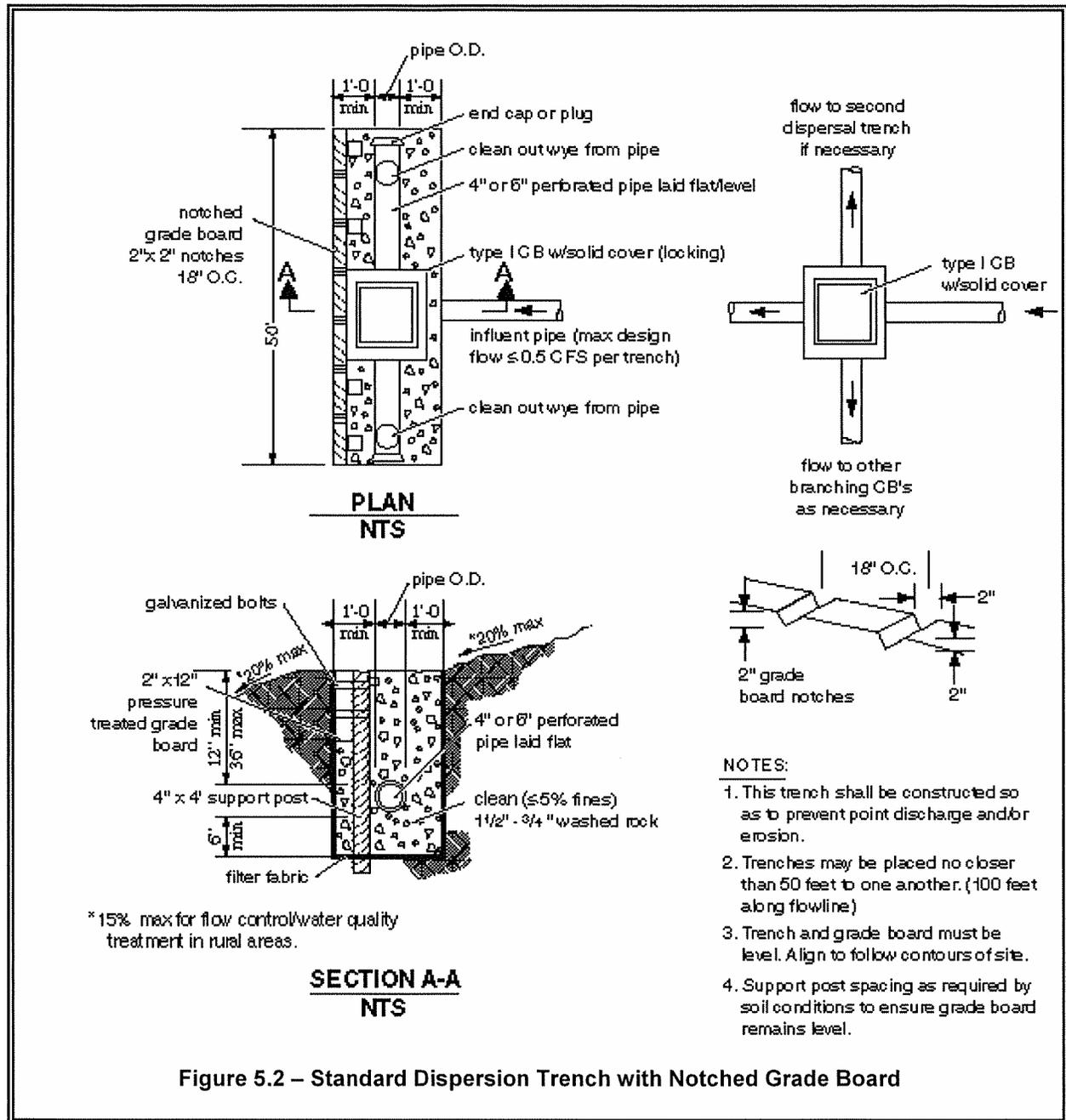


Figure 5.1 – Typical Dispersion Trench



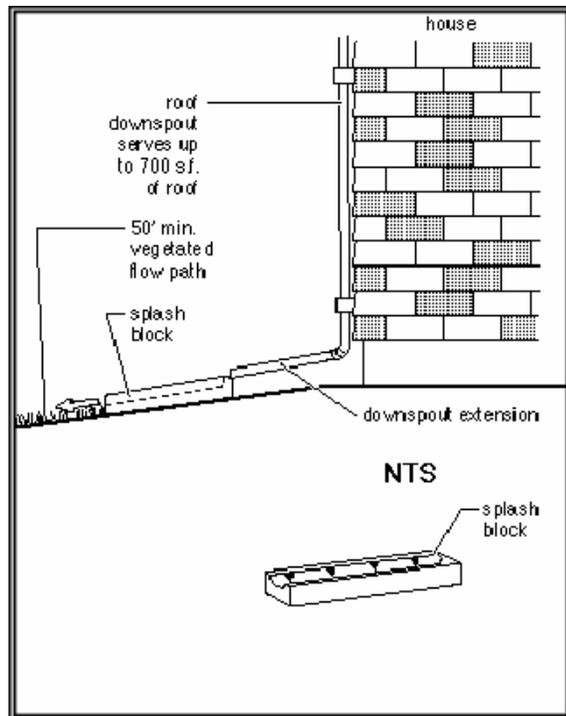


Figure 5.3 – Typical Downspout Splashblock Dispersion

### Additional Design Criteria for Dispersion Trenches

- A vegetated flowpath of at least 25 feet in length must be maintained between the outlet of the trench and any property line, structure, stream, wetland, or impervious surface. A vegetated flowpath of at least 50 feet in length must be maintained between the outlet of the trench and any steep slope. Sensitive area buffers may count towards flowpath lengths.
- Trenches serving up to 700 square feet of roof area may be simple 10-foot-long by 2-foot wide gravel filled trenches as shown on Figure 5-1. For roof areas larger than 700 square feet, a dispersion trench with notched grade board as shown in Figure 5-2 may be used as approved by the Local Plan Approval Authority. The total length of this design must provide at least 10 feet of trench per 700 square feet of roof area and not exceed 50 feet.
- A setback of at least 5 feet must be maintained between any edge of the

trench and any structure or property line.

- No erosion or flooding of downstream properties may result.
- Runoff discharged towards landslide hazard areas must be evaluated by a geotechnical engineer or qualified geologist. The discharge point may not be placed on or above slopes greater than 20% or above erosion hazard areas without evaluation by a geotechnical engineer or qualified geologist and jurisdiction approval.
- For sites with septic systems, the discharge point must be downgradient of the drainfield primary and reserve areas. This requirement can be waived by the jurisdiction's permit review staff if site topography will clearly prohibit flows from intersecting the drainfield.

### Additional Design Criteria for Splashblocks

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 conditions must be met to use splashblocks:

- A vegetated flowpath of at least 50 feet must be maintained between the discharge point and any property line, structure, steep slope, stream, wetland, lake, or other impervious surface.

Sensitive area buffers may count toward flowpath lengths.

- A maximum of 700 square feet of roof area may drain to each splashblock.
- A splashblock or a pad of crushed rock (2 feet wide by 3 feet long by 6 inches deep) shall be placed at each downspout discharge point.
- No erosion or flooding of downstream properties may result.
- Runoff discharged towards landslide hazard areas must be evaluated by a geotechnical engineer or qualified geologist. Splashblocks may not be placed on or above slopes greater than 20% or above erosion hazard areas without evaluation by a geotechnical engineer or qualified geologist and approval by the Local Plan Approval Authority.
- For sites with septic systems, the discharge point must be downslope of the primary and reserve drainfield areas. This requirement can be waived by the Local Plan Approval Authority if site topography clearly prohibits flows from intersecting the drainfield.

### **Perforated Stub-Out Connections**

*A perforated stub-out connection* is a length of perforated pipe within a gravel-filled trench that is placed between roof downspouts and a stub-out to the local drainage system. Figure 3.8 illustrates a perforated stub-out connection. These systems are intended to provide some infiltration during drier months. During the wet winter months, they may provide little or no flow control. Perforated stub-outs are not appropriate when seasonal water table is < 1 foot below trench bottom.

In single-family subdivision projects subject to Minimum Requirement #7 for flow control (see Volume I), perforated stub-out connections may be used only when downspout infiltration or dispersion is not feasible per the criteria in Sections 3.1.1 and 3.1.2.

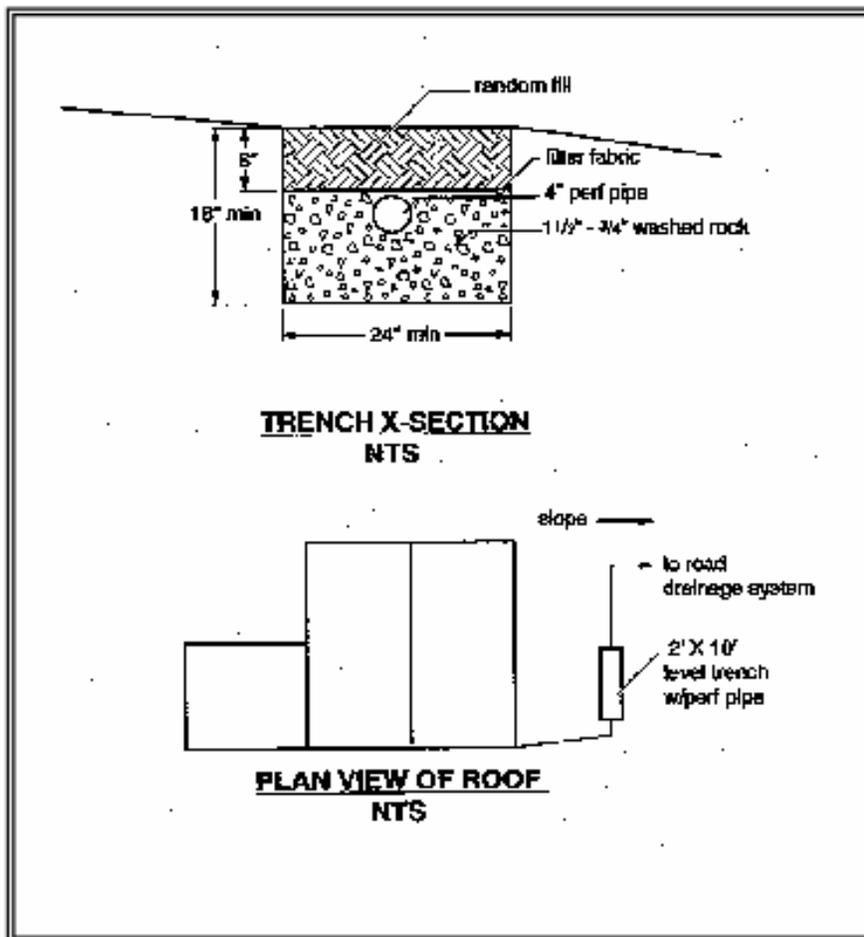
Location of the connection should be selected to allow a maximum amount of runoff to infiltrate into the ground (ideally a dry location on the site that is relatively well drained). To facilitate maintenance, the perforated pipe portion of the system should not be located under impervious or heavily compacted (e.g., driveways and parking areas) surfaces.

Perforated stub-out connections should consist of at least 10 feet of perforated pipe per 5,000 square feet of roof area laid in a level, 2-foot wide trench backfilled with washed drain rock. The drain rock should extend to a depth of at least 8 inches below the bottom of the pipe and should cover the pipe. The pipe should be laid level and the rock trench covered with filter fabric and 6 inches of fill (see Figure 3.8).

Setbacks are the same as for infiltration trenches.

Potential runoff discharge towards a landslide hazard area must be evaluated by a professional engineer with geotechnical expertise or a licensed geologist, hydrogeologist, or engineering geologist. The perforated portion of the pipe may not be placed on or above slopes greater than 20% or above erosion hazard areas without evaluation by a professional engineer with geotechnical expertise or qualified geologist and jurisdiction approval.

For sites with septic systems, the perforated portion of the pipe must be downgradient of the drainfield primary and reserve areas. This requirement can be waived if site topography will clearly prohibit flows from intersecting the drainfield or where site conditions (soil permeability, distance between systems, etc) indicate that this is unnecessary.



Source: King County

Figure 3.8 Perforated Stub-Out Connection