

### 3.1.2 Downspout Dispersion Systems (BMP T5.10B)

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.

#### ***Applications & Limitations***

Downspout dispersion may be used in all subdivision lots where downspout full infiltration, full dispersion, and bioretention/rain gardens are not feasible.

#### ***Flow Credit for Roof Downspout Dispersion***

In WWHM3, roof areas may be modeled as grassed surfaces if roof runoff is dispersed according to the requirements of this section on lots greater than 22,000 square feet, and the *vegetative flow*\* path is 50 feet or larger through undisturbed native landscape or lawn/landscape area that meets BMP T5.13. This is done in WWHM on the Mitigated Scenario screen by entering the roof area into one of the entry options for dispersal of impervious area runoff. For WWHM 2012, see Appendix III-C in this Volume.

#### ***Design Criteria***

1. Use downspout trenches designed as shown in [Figures 3.1.5](#) and [3.1.6](#) for all downspout dispersion applications except where splash blocks are allowed below.
2. Splash blocks shown in [Figure 3.1.7](#) 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, slope over 15%, stream, wetland, or other impervious surface. Sensitive area buffers may count toward flowpath lengths.
3. Cover the vegetated flowpath 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.
4. If the vegetated flowpath (measured as defined above) is less than 25 feet, a perforated stub-out connection per [Section 3.1.3](#) may be used in lieu of downspout dispersion. 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. 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

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\* *Vegetative flow* path is measured from the downspout or dispersion system discharge point to the downstream property line, stream, wetland, or other impervious surface.

yards. Perforated stub-outs are not appropriate when seasonal water table is <1 foot below trench bottom.

*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 downgradient of the drainfield. This requirement may be waived if site topography clearly prohibits flows from intersecting the drainfield.

### **Design Criteria for Dispersion Trenches**

1. 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 slope steeper than 15%. Sensitive area buffers may count towards flowpath lengths.
2. 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 in [Figure 3.1.5](#). For roof areas larger than 700 square feet, a dispersion trench with notched grade board as shown in [Figure 3.1.6](#) or alternative material approved by the Local Plan Approval Authority may be used. The total length of this design must not exceed 50 feet and must provide at least 10 feet of trench 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.
4. No erosion or flooding of downstream properties may result.
5. 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 on or above slopes greater than 15% or above erosion hazard areas without evaluation by a geotechnical engineer or qualified geologist and jurisdiction approval.
6. For purposes of maintaining adequate separation of flows discharged from adjacent dispersion devices, 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.

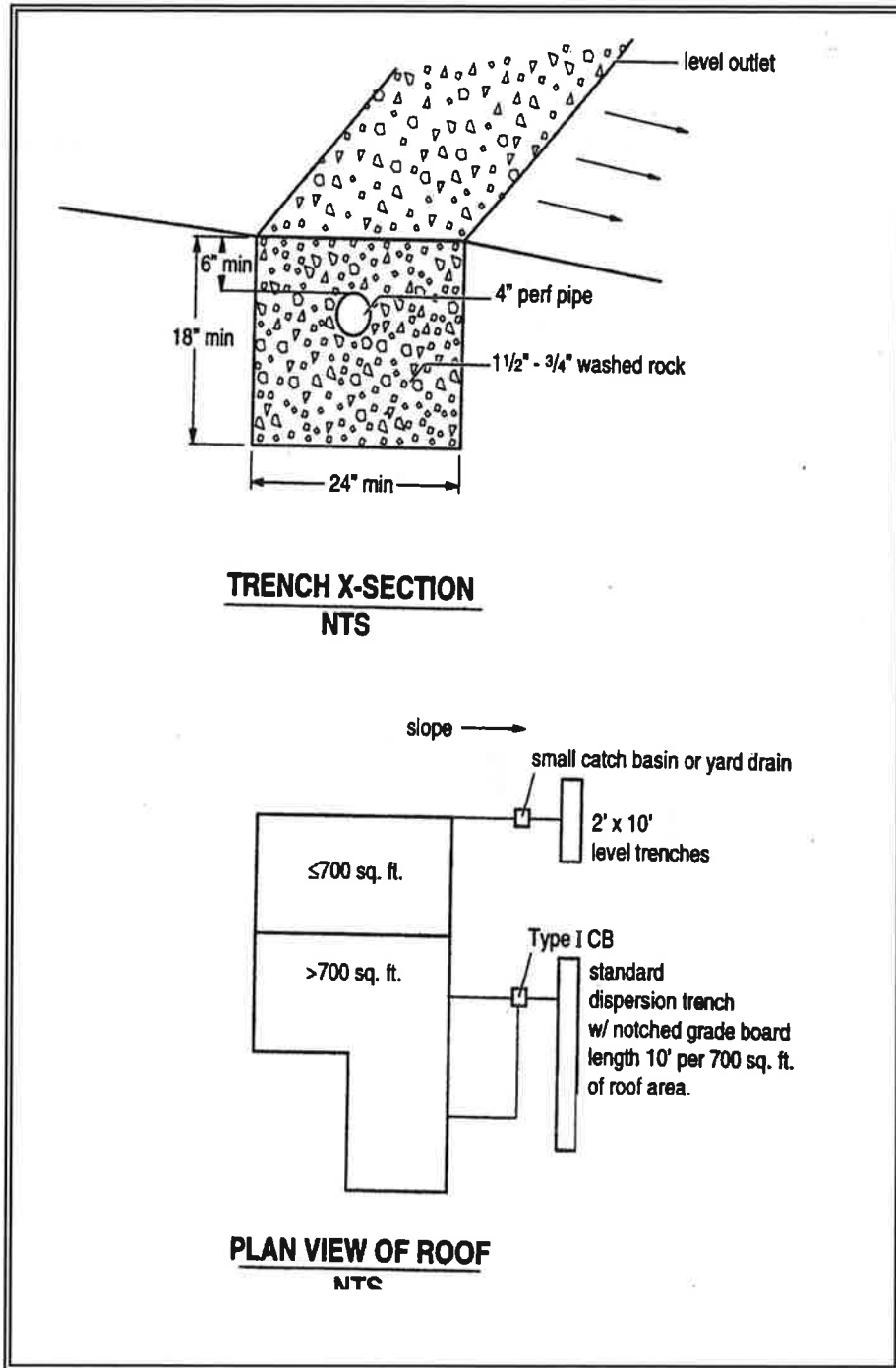


Figure 3.1.5 - Typical Downspout Dispersion Trench

Source: King County

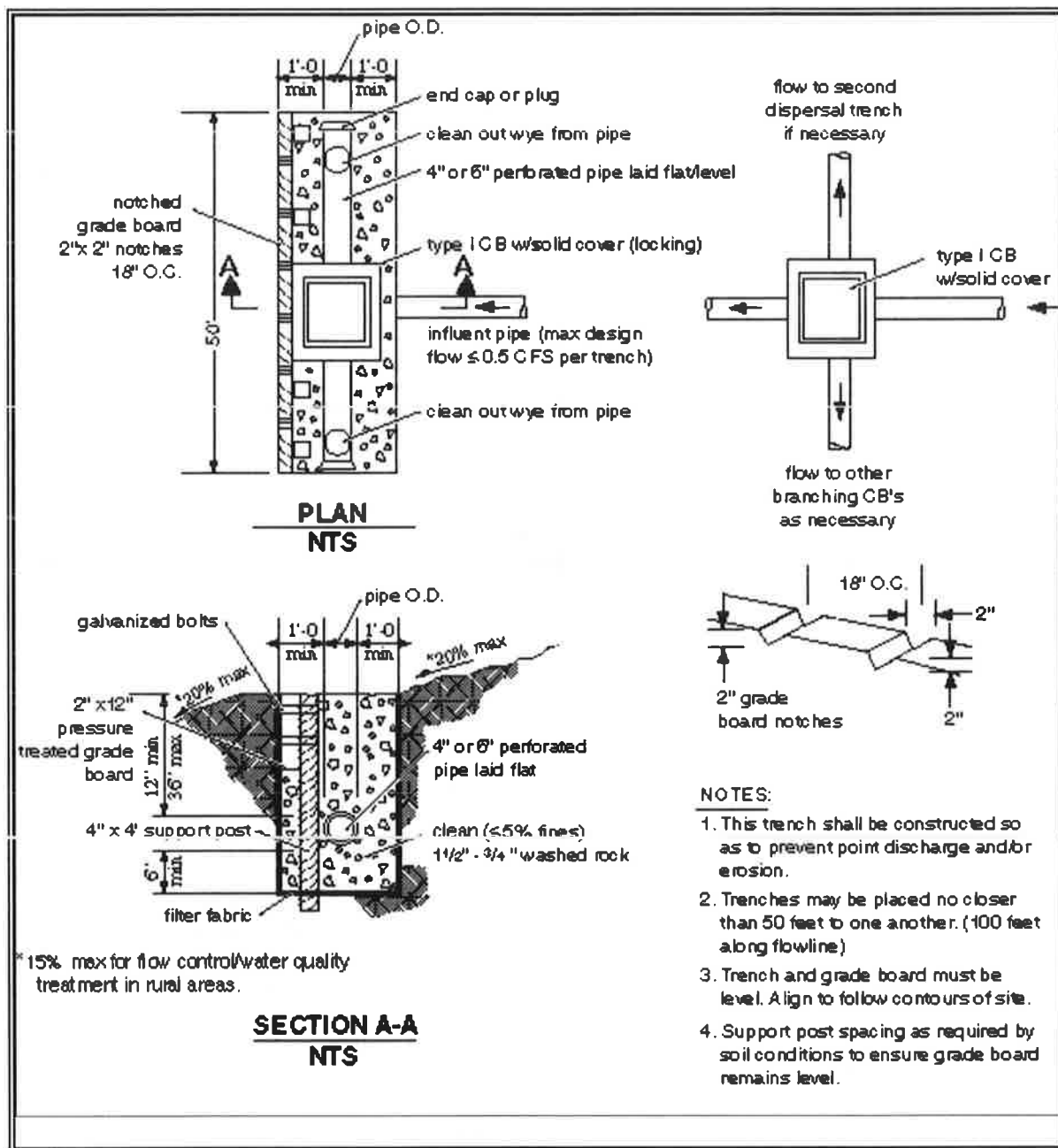


Figure 3.1.6 - Standard Dispersion Trench with Notched Grade Board

### **Design Criteria for Splashblocks**

A typical downspout splashblock is shown in [Figure 3.1.7](#). 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 flowpath 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 flowpath lengths.
2. A maximum of 700 square feet of roof area may drain to each splashblock.
3. For purposes of maintaining adequate separation of flows discharged from adjacent dispersion devices, the vegetated flowpath segment for the splashblock must not overlap with other flowpath segments, except those associated with sheet flow from a non-native pervious surface.
4. 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.
5. No erosion or flooding of downstream properties may result.
6. Have a geotechnical engineer or a licensed geologist, hydrogeologist, or engineering geologist evaluate runoff discharged towards landslide hazard areas. Do not place Splashblocks on or above slopes greater than 15% or above erosion hazard areas without evaluation by a professional engineer with geotechnical expertise or a licensed geologist, hydrogeologist, or engineering geologist, and approval by the Local Plan Approval Authority.
7. For sites with septic systems, the discharge point 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.

