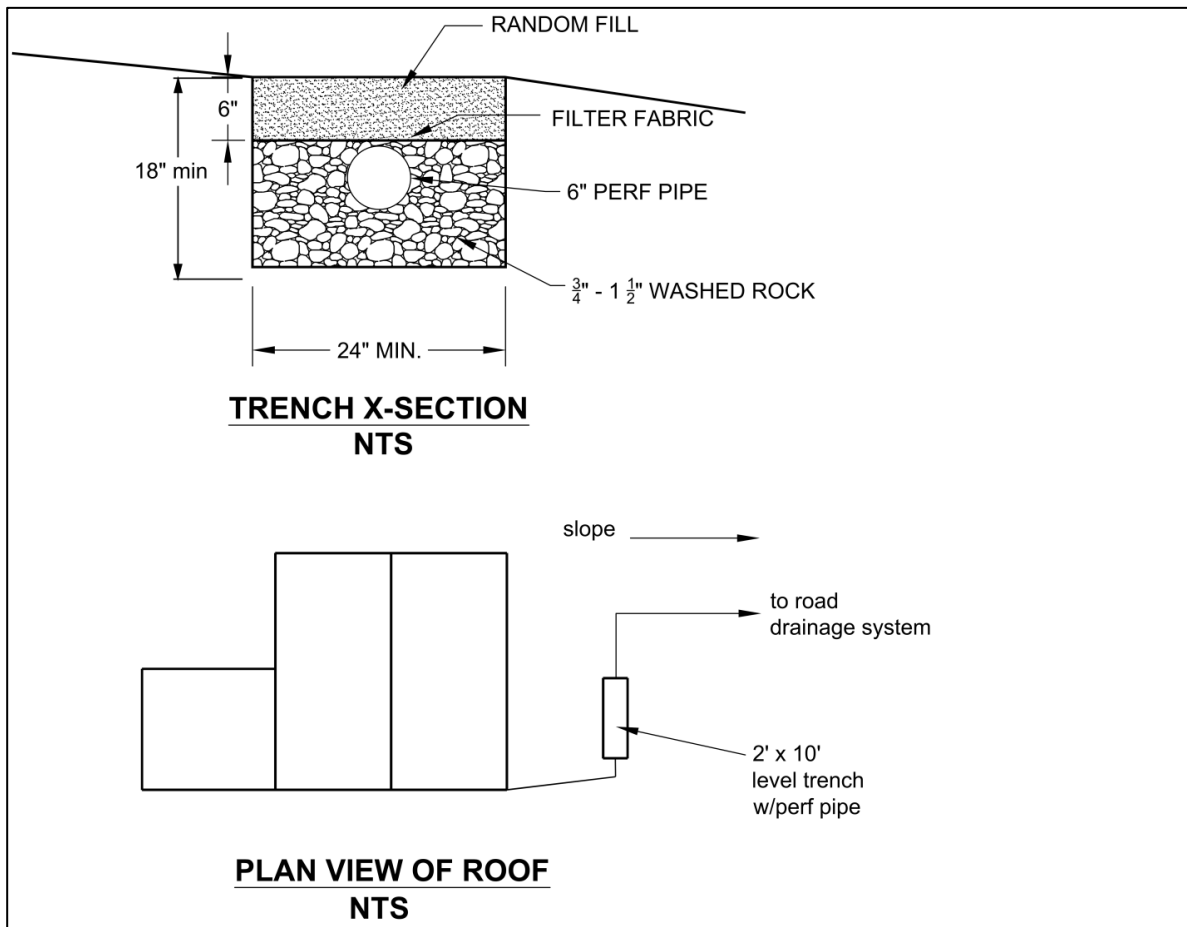


## BMP T5.10D: Perforated Stub-out Connections

### Purpose and Description

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. This BMP provides some infiltration during drier months. During the wet winter months, they may provide little or no flow control.



**Figure 2.7: Typical Perforated Stub-out Connection**

(Source: King County Surface Water Design Manual 2009)

### Cross Reference Guide

Soils Assessment	NA
Meets Minimum Requirements	#5
Related BMPs	None
Selection Criteria	<a href="#">Book 1, Sections 2.2 and 2.5.1</a>
Maintenance	<a href="#">Book 4</a>

**ADD:**  
 Perforated stub outs do not provide pretreatment. Perforated stub outs are not allowed to drain into a subsurface detention or retention facility without first connecting to a pretreatment BMP under Minimum Requirement #6.

### Applications, Limitations and Setbacks

In projects subject to Minimum Requirement #5 perforated stub-out connections may be used only when all other higher priority on-site stormwater management BMPs are not feasible, per the criteria for each of those BMPs.

Perforated stub-outs cannot be used when the seasonal water table is less than one foot below trench bottom.

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.

Select the location of the connection to allow a maximum amount of runoff to infiltrate into the ground (ideally a dry, relatively well drained, location). To facilitate maintenance, do not locate the perforated pipe portion of the system under impervious or heavily compacted (e.g., driveways and parking areas) surfaces.

Have a licensed geologist, hydrogeologist, or engineering geologist evaluate potential runoff discharges towards landslide hazard areas. Do not place the perforated portion of the pipe on or above slopes greater than 20% or above erosion hazard areas without evaluation by a professional engineer with geotechnical expertise or qualified geologist.

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.

#### Setbacks

Setbacks shall be the same as for downspout infiltration trenches provided in [BMP T5.10A](#).

## Design Criteria

- The BMP must have 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 shall be extended to a depth of at least 8 inches below the bottom of the pipe and shall cover the pipe.
- The rock trench shall be covered with filter fabric and 6 inches of fill.

## Runoff Modeling Representation

Any flow reduction is variable and unpredictable. No computer modeling techniques are allowed that would predict any reduction in flow rates and volumes from the connected area.