

Design Standards and Permitting Requirements

Dispersion

DESCRIPTION

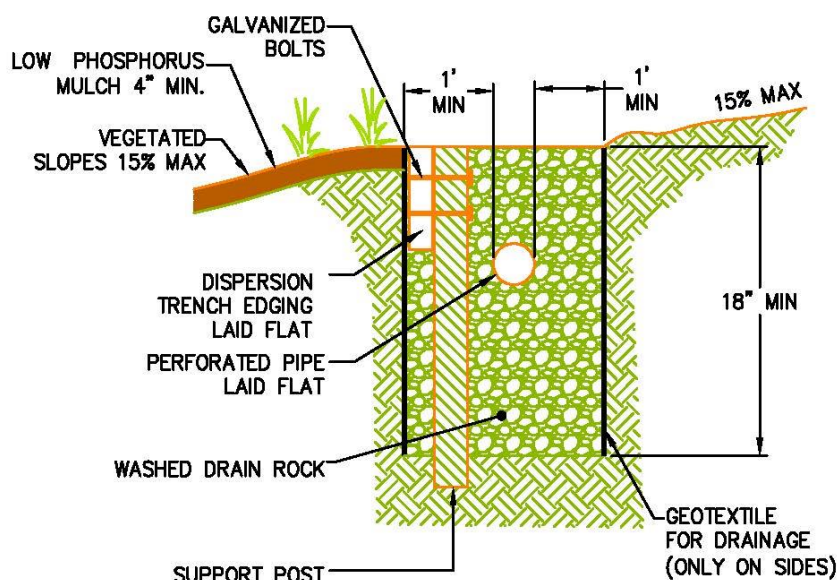
A surface drainage facility, consisting of washed rock and constructed with a flat bottom, intended to convert concentrated flows into sheet flows for dispersion into existing or newly established vegetated areas. This facility does not have underdrain, bypass, or overflow structures.

METHOD OF PHOSPHORUS REDUCTION

Treatment via dispersion into native forested areas. Runoff entering the rock trench is spread evenly throughout the trench and then overflows evenly into the vegetated area. Plants and mulch in the vegetated area capture, neutralize, and recycle phosphorus into healthy plants and soil.



Above: Dispersion system uses nearby forested area



SECTION VIEW

ADDITIONAL DESIGN FEATURES

Enhance your dispersion system with one or more of the following site-specific options:

"Dry Creek Bed" where river rock creates the look of a stream channel in the landscape.

"Dispersion Walkway" where pea gravel creates durable pathways.

"Garden Path" where low-P mulch provides a way to access and enjoy the landscape (only allowed through landscaped areas).

Note: This design methodology is applicable for HIP projects only. These methods may not be suitable for, and have not been evaluated for, compliance with regulations which require professional engineering.



MINIMUM REQUIREMENTS AND DESIGN LIMITATIONS

All dispersion projects must meet these minimum requirements in order to be approved for construction under these HIP Standards:

DESIGN

- At least 24" wide in all locations
- Rock at least 18" deep
- Total slope of trench less than 2%
- Bottom of trench cannot contact groundwater
- No single trench longer than 50', use multiple trenches.
- Vegetated flow path is long enough to absorb all dispersed runoff¹
- Plant density in flow path meets minimum requirements²

¹ use Dispersion Calculator to determine required flow path

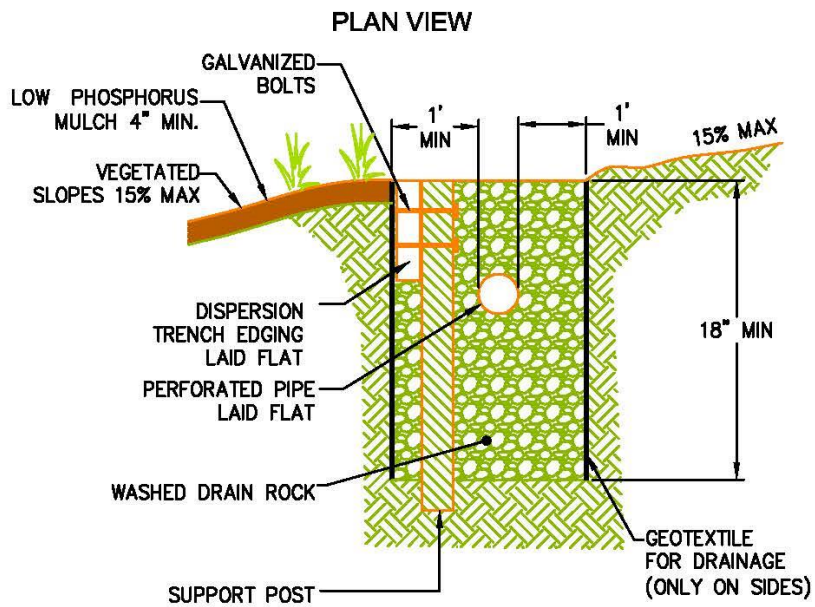
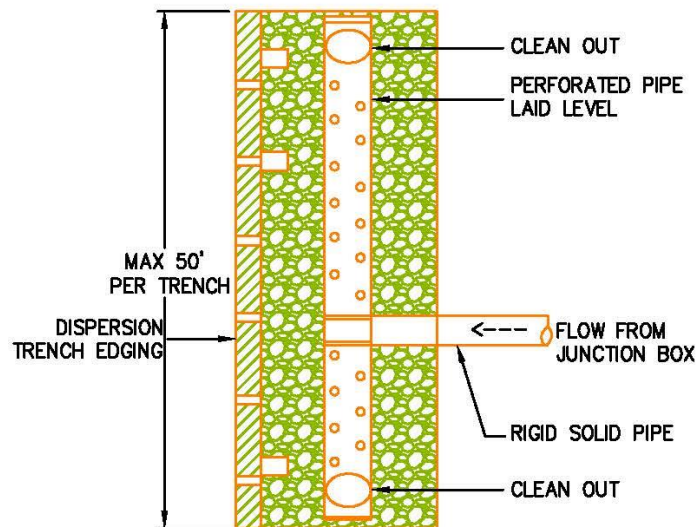
² use the Native Landscaping BMP to create a new vegetated flow path

LOCATION

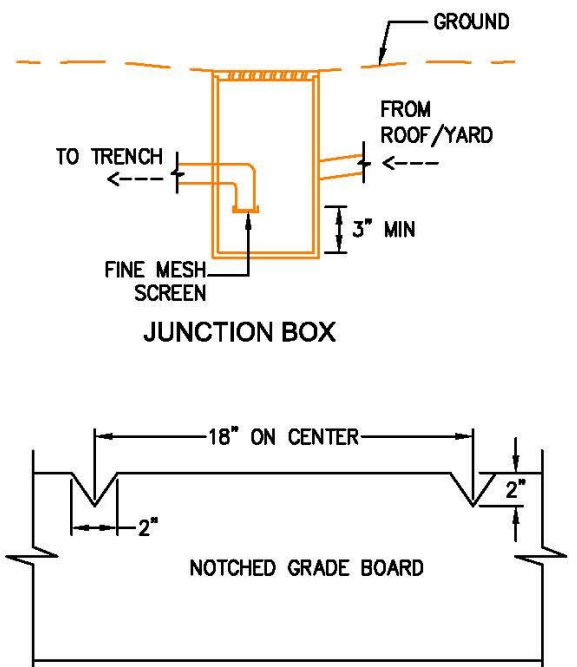
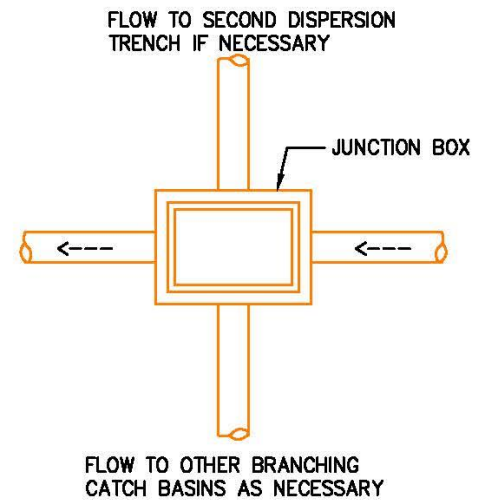
- **Critical Areas:** setback requirements near critical areas (wetlands, shorelines, or creeks) and their buffers will vary depending on site specifics. Consult with the HIP Coordinator for requirements pertaining to each unique site.
- **Slopes:** unless approved by a licensed geotechnical engineer, trenches cannot be placed on slopes >15% and must be at least 50' upgradient from slopes steeper than 35%
- **Separation:** at a minimum, all dispersion facilities must be at least: 25' from shorelines or creeks (distance is greater when critical areas are present), 5' from known public and private utilities, 5' from structures with slab-on-grade foundations and 10' from structures with a basement or crawl space. Septic tanks must be protected by placing the trench at least 5' from tanks, and 10' upgradient and 30' downgradient from drain fields and drain field reserve areas
- **Property Lines:** trenches cannot be located in public rights-of-way and dispersed water should not cross property lines. Consult with the HIP Coordinator to determine site-specific setback requirements.

CONSTRUCTION METHOD/ CRITICAL PATH

1. Install erosion controls
2. Excavate soil and reuse on site or dispose
3. Gently scarify subgrade
4. Install 75% base rock in first lift
5. Install elevated distribution pipe
6. Install drains and conveyance into trench from site surfaces
7. Connect conveyance to distribution pipe
8. Install second lift of rock (25%) to reach final grade
9. Install surfacing (optional)
10. Stabilize disturbed soils
11. Remove erosion controls



SECTION VIEW



DISPERSION TRENCH EDGING

DISPERSION TRENCH
HIP BMP "D" TYPICAL

NTS



Design Submittal

Dispersion

Section I: System and Sizing Summary

<input type="checkbox"/>	I have provided a site plan and facility cross-section.
<input type="checkbox"/>	I have defined the area that will drain into the trench by piping.
The drainage area is _____ ft² of impervious surface and/or _____ ft² of lawn/landscape	
<input type="checkbox"/>	I have defined the area that will drain into the trench by sheet flow
That area is _____ ft² of impervious surface and/or _____ ft² of lawn/landscape	
<input type="checkbox"/>	I have sized the trench using approved methodology (HIP Sizing Calculator or stormwater hydrological modeling software) and attached that data.
The trench will be at least _____ feet long and the downstream vegetated flow path must be at least _____ feet in length.	

Section II: Site-Specific Planning









<input type="checkbox"/>	I have determined that the trench is at least 5' from known private or public utilities.
<input type="checkbox"/>	I have determined that the trench is at least 5' from structures with slab-on-grade foundations and 10' from structures with a basement or crawl space.
<input type="checkbox"/>	I have determined that the trench is not on or next to a slope steeper than 15% and not within 50' upgradient of a slope steeper than 35%.
<input type="checkbox"/>	I have developed an erosion control plan for the excavation of the trench and completed a site-specific SWPPP that is included with this application.



Sizing Calculator

Dispersion

Step 1: Determine Trench Length. Measure the hard surface area draining to the trench. Measure the lawn/landscaping surface area draining to the trench. Use the following formula to calculate the length of dispersion trench that is needed to adequately manage the runoff directed to the system. All dispersion trenches are 2' wide at minimum. Runoff from a pipe that crosses at least 25' of lawn or landscape before reaching the trench can be considered sheet flow.

Drainage Type	Impervious Surface (square feet)	Hard Surface Multiplier	Lawn/Landscape (square feet)	Lawn/LS Multiplier	Minimum Trench Length (linear feet)
Sheet Flow	[ 0.009]	 [ 0.005]			
Piped Flow	[ 0.014]	 [ 0.005]			
Total length of trench needed (add trench lengths above):					

Step 2: Determine Vegetated Flow Path Length. Use the following formula to calculate how far the dispersed water must travel, through vegetation, before it leaves your property or enters a water body. Runoff from a pipe that crosses at least 25' of lawn or landscape before reaching the trench can be considered sheet flow.

Drainage Type	Hard Surface (square feet) "A"	Lawn/Landscape (square feet) "B"	Lawn Length "C"	Formula	Minimum Flow Path Length* (linear feet)
Sheet Flow	Not part of formula	Not part of formula		$((C-25)/3)+25$	
Piped Flow			Not part of formula	$((A+1)/(A+B)) * 100 + 25$	
Total length of vegetated flow path needed* (add flow path lengths above):					

* Note that the total vegetated flow path length will never be less than 25' or more than 100'. If your calculation comes out below or above those numbers, adjust up to 25 or down to 100.

Step 3: If there is no existing established vegetated flow path on-site to disperse to and a vegetated flow path needs to be created, please use the Native Landscaping BMP and accompanying calculator and submittal page in addition to this Dispersion BMP.