Disconnection of Non-Rooftop Runoff

Non-rooftop disconnection involves directing flow from impervious surfaces onto vegetated areas where it can soak into or filter over the ground. This disconnects these surfaces from the storm drain system, reducing both runoff volume and pollutants delivered to receiving waters. There are many opportunities for disconnecting impervious surfaces in both new and redevelopment designs. Non-rooftop disconnection is commonly applied to smaller or narrower impervious areas like driveways, open section roads, and small parking lots and is dependent on several site conditions (e.g., permeable flow path length, soils, slopes) to function well. Non-rooftop disconnection is possible in commercial, industrial, and residential settings given the constraints listed below.

Constraints

The following constraints are critical when considering the use of non-rooftop disconnection to capture and treat stormwater runoff.

- **Space:** A permeable, vegetated treatment area equal to the minimum flow path length needed for treatment (see Table 1, below) must be available down gradient (downslope) of the impervious cover to effectively disconnect runoff.
- **Topography:** Runoff must be conveyed as sheetflow onto and across open areas to maintain proper disconnection. Disconnections should be located on gradual slopes (≤ 5%) and directed away from buildings to both maintain sheetflow and prevent water damage to basements and foundations. If slopes are in excess of 5%, additional measures (terraces or berms) will be required to maintain sheetflow.
- **Soils:** Non-rooftop disconnection works best in undisturbed, sandy soils that allow runoff to infiltrate. Clay soils and hardpan or other soil conditions that reduce permeability also reduce the effectiveness of this practice; therefore, the volume reduction credit is tied to the hydrologic soil group of the receiving area. *(Offering increased credit or incentive for disconnection to amended or engineered soil areas remains under consideration.)*
- **Drainage Area:** The impervious area draining to each discharge location should be small enough to prevent flow concentration onto permeable treatment areas. Disconnections may not be feasible for large blocks of impervious cover, or for areas with limited discharge points.
- **Hotspot Runoff:** Disconnections should not be used to treat hotspots that generate higher concentrations of hydrocarbons, trace metals, or toxicants than are found in typical stormwater runoff and which may contaminate groundwater. Disconnections are generally discouraged over contaminated sites or abandoned landfills. (*Further guidance regarding stormwater management on brownfields is likely forthcoming from DEC Waste Management Division.)*
- **Other Considerations:** For sites with septic systems, the discharge point must be cross-gradient down-gradient of the leachfield primary and reserve areas. This requirement may be waived if site topography clearly prohibits flows from intersecting the leachfield.

Design Guidance

Non-rooftop disconnections shall meet the following conditions:

- Runoff from disconnected areas shall drain in a safe and non-erosive manner through vegetated areas to the property line or to a downstream BMP. The vegetative cover in the receiving area must be either forest (with a well-distributed stand of trees) or meadow (with dense grasses and/or shrubs that is mown no more than twice per year) (ME DEP 2010).
- Runoff must enter the disconnection areas as sheet flow for the water quality storm (1” storm) and cannot be allowed to channelize. A depression, berm, level spreader or other transition strip should be provided from the disconnected area to the vegetated area to assure that runoff will flow in a safe and non-erosive

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manner during larger storm events (MDE/CWP 2009; CSN 2008).

- Only continuous flow path length may be counted.
- The maximum contributing impervious flow path length shall be 75 feet, and the maximum contributing pervious flow path shall be 150 feet (CSN 2008; MDE/CWP 2009).
- Disconnections shall be located on an average slope of 5% or less (MDE/CWP 2009). Terraces, berms, or similar grade controls may be used where average slopes exceed 5% and should be placed every 20 feet along the flow path (CSN 2008).
    - An exception to the requirement for grade controls will be made for developed areas with small amounts (<10%) of impervious cover (e.g., single family residential lots) (ME DEP 2010).
    - In all cases the disconnection area slope must be less than 15%; areas with slopes greater than 15% are too steep to be effective as treatment buffers and should be left undisturbed (ME DEP 2010).
- The drainage area to any one discharge location shall be 1,000 ft^2 or less (MDE/CWP 2009; VT DEC 2002).
- Runoff from these impervious surfaces may be directed as sheetflow to undisturbed natural areas – either forest (with a well-distributed stand of trees) or meadow (with dense grasses and/or shrubs that is mown no more than twice per year) (ME DEP 2010; SPU 2009).

Performance and Credit

Disconnection is assigned a credit of 50% on A/B soils and 25% on C/D soils (CSN 2008) for the 1" storm event (Table 2), when the flow path length shown in Table 1, below, is provided (ISBD 2011; ME DEP 2010).

Table 1. Required Non-Rooftop Disconnection Buffer Widths by Slope Class

Buffer Slope	**<5%**	**5-10%**	**10-15%**
Minimum Buffer Width (feet)	20	35	50
Contributing Impervious Surface Width (feet)	Up to 20	Up to 20	Up to 20
Contributing Impervious Surface Widths Over 20 feet	+ 5 feet of width must be added for additional 5 feet of contributing width or fraction thereof, up to a maximum of 75 feet of total contributing width		
Maximum Buffer Width (feet)	75	90	105

Table 2. Credits for Non-Rooftop Disconnection

Hydrologic Soil Group (HSG)	**PE (in.)**
A/B	0.5
C/D	0.25

For More Information

All information regarding the Vermont Stormwater Management Manual Update process is available at: http://www.vtwaterquality.org/stormwater/htm/sw_manualrevision.htm.

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