

HSC-2: Impervious Area Dispersion

Impervious area dispersion refers to the practice of routing runoff from impervious areas, such as rooftops, walkways, and patios onto the surface of adjacent pervious areas. Runoff is dispersed uniformly via splash block or dispersion trench and soaks into the ground as it move slowly across the surface of pervious areas. Minor ponding may occur, but it is not the intent of this practice to actively promote localized on-lot storage (See HSC-1: Localized On-Lot Infiltration).

- Also known as:**
- Downspout disconnection
  - Impervious area disconnection
  - Sheet flow dispersion



Simple Downspout Dispersion

Source: [toronto.ca/environment/water.htm](http://toronto.ca/environment/water.htm)

**Feasibility Screening Considerations**

- Impervious area dispersion can be used where infiltration would otherwise be infeasible, however dispersion depth over landscaped areas should be limited by site-specific conditions to prevent standing water or geotechnical issues.

**Opportunity Criteria**

- Rooftops and other low traffic impervious surface present in drainage area.
- Soils are adequate for infiltration. If not, soils can be amended to improve capacity to absorb dispersed water (see MISC-2: Amended Soils).
- Significant pervious area present in drainage area with shallow slope
- Overflow from pervious area can be safely managed.

**OC-Specific Design Criteria and Considerations**

- Soils should be preserved from their natural condition or restored via soil amendments to meet minimum criteria described in Section .
- A minimum of 1 part pervious area capable of receiving flow should be provided for every 2 parts of impervious area disconnected.
- The pervious area receiving flow should have a slope  $\leq 2$  percent and path lengths of  $\geq 20$  feet per 1000 sf of impervious area.
- Dispersion areas should be maintained to remove trash and debris, loose vegetation, and protect any areas of bare soil from erosion.
- Velocity of dispersed flow should not be greater than 0.5 ft per second to avoid scour.

**Calculating HSC Retention Volume**

- The retention volume provided by downspout dispersion is a function of the ratio of impervious to pervious area and the condition of soils in the pervious area.
- Determine flow patterns in pervious area and estimate footprint of pervious area receiving dispersed flow. Calculate the ratio of pervious to impervious area.
- Check soil conditions using the soil condition design criteria below; amend if necessary.
- Look up the storm retention depth,  $d_{HSC}$  from the chart below.

- The max  $d_{HSC}$  is equal to the design storm depth for the project site.

**Soil Condition Design Criteria**

- Maximum slope of 2 percent
- Well-established lawn or landscaping
- Minimum soil amendments per criteria in MISC-2: Amended Soils.

**Configuration for Use in a Treatment Train**

- Impervious area disconnection is an HSC that may be used as the first element in any treatment train
- The use of impervious area disconnection reduces the sizing requirement for downstream LID and/or treatment control BMPs



<sup>1</sup> Pervious area used in calculation should only include the pervious area receiving flow, not pervious area receiving only direct rainfall or upslope pervious drainage.

**Additional References for Design Guidance**

- SMC LID Manual (pp 131)  
[http://www.lowimpactdevelopment.org/guest75/pub/All\\_Projects/SoCal\\_LID\\_Manual/SoCalLID\\_Manual\\_FINAL\\_040910.pdf](http://www.lowimpactdevelopment.org/guest75/pub/All_Projects/SoCal_LID_Manual/SoCalLID_Manual_FINAL_040910.pdf)
- City of Portland Bureau of Environmental Services. 2010. How to manage stormwater – Disconnect Downspouts. <http://www.portlandonline.com/bes/index.cfm?c=43081&a=177702>
- Seattle Public Utility:  
[http://www.cityofseattle.org/util/stellent/groups/public/@spu/@usm/documents/webcontent/spu01\\_006395.pdf](http://www.cityofseattle.org/util/stellent/groups/public/@spu/@usm/documents/webcontent/spu01_006395.pdf)
- Thurston County, Washington State (pp 10):  
[http://www.co.thurston.wa.us/stormwater/manual/docs-faqs/DG-5-Roof-Runoff-Control\\_Rev11Jan24.pdf](http://www.co.thurston.wa.us/stormwater/manual/docs-faqs/DG-5-Roof-Runoff-Control_Rev11Jan24.pdf)