



# Drainage Program Guide

## Green Stormwater Infrastructure (GSI)

### Best Management Practice: Downspout Disconnection

Downspout disconnection is the process of disconnecting the downspout from the combined sewer, and directing water from rain and snowmelt to an area where it can soak into the ground. Downspouts are often connected to a pipe in the ground that connects directly to the sewer system or may discharge onto a paved surface, such as a driveway or parking area, which convey water directly into the sewer system during wet weather. Redirecting downspouts to a landscaped or grass area is a great way to help reduce runoff from a property and is an even better practice if the water is then redirected to flow into a rain garden or collected for re-use.

#### What credits can I get for disconnecting downspouts?

The credit for downspout disconnection is directly related to the size and/or the type of outlet location (lawn or bioretention area). Larger lawn areas and more highly designed stormwater practices will result in a larger credit. An automatic 25 percent credit is applied to residential parcels to account for downspout disconnection and other disconnected impervious surfaces. Detroit residents are required by state law to disconnect downspouts leading to the combined sewer system, therefore residential properties that do not have disconnected downspouts may lose all or a portion of the automatic credit in the future. Downspout disconnection must be conducted properly to ensure it does not cause a nuisance to your or an adjoining property.

**NOTE:** Residential customers receive an automatic 25 percent credit. If practice does not exceed the 25 percent automatic credit, no additional credit will be applied.

#### How hard is it to disconnect downspouts?

Disconnection is a simple process and materials are easily purchased. Any current connections to the combined sewer system must be cut and stormwater must be directed away from buildings to green space with elbows, extensions, and/or splash pads. If there is an existing sewer connection, the most difficult step is cutting through the downspout and plugging the existing pipe.

#### What type of maintenance is required?

Maintenance of areas receiving disconnected downspout stormwater is generally the same as that required for other lawn or landscaped areas. Proper maintenance of gutters, downspouts, and landscaping can help reduce problems.



*Downspout should not be directed to impervious areas as depicted in this example. Here stormwater flows down the driveway to the street. The discharge can also cause an icing hazard.*



*Downspouts should be directed to a lawn area or a rain garden.*



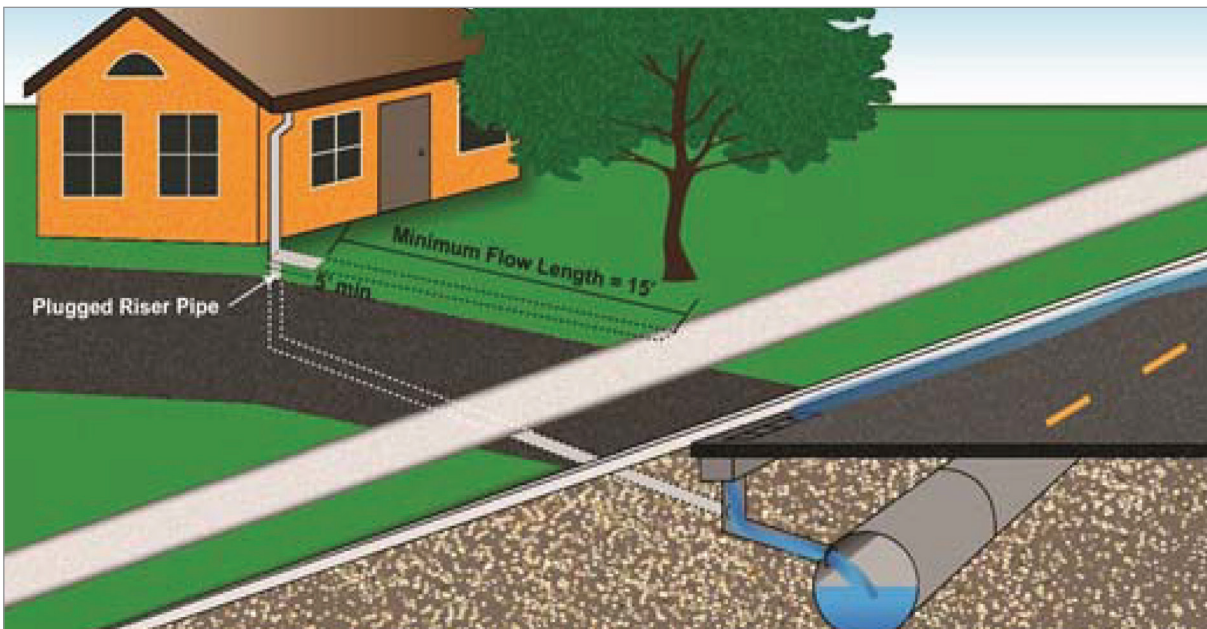
*Simple techniques like elbows, extensions, or rain chain/cascading designs can help direct stormwater away from the foundation, property, and on to lawn areas.*

## What is the typical cost of disconnecting downspouts?

The cost of downspout disconnection is dependent on existing site conditions, piping materials, and size of property and therefore will vary by site. Disconnection of downspouts that are external are expected to cost less than disconnection of internal downspouts.

## Where should disconnected downspouts be located? (Siting Requirements)

Downspouts must be directed to a pervious area consisting of well-established vegetation. Rainwater exiting the disconnected downspout must not result in flooding, icing hazards, or discharge to public right-of-ways and/or neighboring properties. Downspouts should not be directed to other impervious areas (i.e., driveways, walkways), or onto bare or compacted soil or poorly vegetated surfaces. They must be properly extended away from a building's foundation. To prevent nuisance issues, downspout disconnections should be implemented so there is sufficient area for water to discharge. This may require the use of extensions connected to the downspout to redirect water to green spaces on the property. Rainwater from the downspout can be collected for reuse (refer to the *Cistern GSI Best Management Practice* for detailed information).



When locating your disconnection, keep the following in mind:



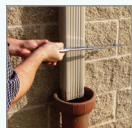





- ◆ **Minimum Flow Path:** The minimum recommended flow path from the end of the downspout to the property line or other impervious surface is 15 feet.
- ◆ **Minimum Distance from Structure:** The minimum distance from the structure at which the downspout should discharge is 5 feet. The discharge must be sloped away from the structure.
- ◆ **Slope:** The slope of the pervious area onto which flow is discharged should be less than a 1-foot drop over 20 feet.
- ◆ **Infiltration Rate:** A minimum soil infiltration rate of 0.1 inch per hour is assumed in the standard credit calculations.

## Design and Installation

Typically, an existing external downspout is cut above ground level. An elbow and an extension are then added to the downspout to divert rainwater and snowmelt away from the building or structure and onto the ground. The abandoned drain pipe is then capped. A splash pad may also be attached at the end of the downspout extension to prevent erosion in garden areas and to help direct the flow of water.

When disconnecting a downspout, it is important that the discharge point is 5 feet from the foundation and the flow length to the property line is 15 feet.

## Recommended Steps for Disconnecting a Downspout

<p><b>Step 1</b></p> 	<p>Locate the connection between the downspout and the storm drain and measure approximately 9 inches from where the downspout enters the storm drain pipe.</p>	<p><b>Step 5</b></p> 	<p><b>Straight Pipe:</b> Cap the sewer pipe to prevent water from entering it. In most cases, a rubber cap secured by a hose clamp may be used. Use a screwdriver or ratchet to tighten the cap until it is secure.</p>
<p><b>Step 2</b></p> 	<p>Cut the downspout with a hacksaw where it was measured in Step 1 and right above where the downspout enters the pipe. Remove that section of downspout.</p>	<p><b>Step 6</b></p> 	<p>Insert the downspout into the elbow. If necessary, crimp the end of the downspout with a pair of pliers to get a good fit. Secure downspout with a screw or rivet.</p>
<p><b>Step 3</b></p> 	<p>Determine if the pipe where the downspout attaches is a bell shape or straight connection.</p>	<p><b>Step 7</b></p> 	<p>A 5-foot downspout extension is recommended to carry stormwater away from foundations, sidewalks, and driveways. It is critical to ensure that the disconnected downspout does not cause a hazard or nuisance to neighboring properties.</p>
<p><b>Step 4</b></p> 	<p><b>Bell Shape Pipe:</b> Cut about a 1 foot by 1 foot amount of chicken wire and form it into a cup shape. Place it into the pipe just below the bell. Add crumpled newspaper on top of the mesh (to help ensure the concrete does not leak down into the sewer). Mix the concrete according to directions and add concrete until it is flush with top of bell.</p>	<p><b>Step 8</b></p> 	<p><b>Optional:</b> Attach a splash pad to the end of the downspout extension to prevent erosion in garden areas and to help direct the flow of water.</p>

### Supplies needed for disconnecting downspouts

- Work gloves
- Eye protection
- Dust mask
- Hacksaw
- Measuring tape
- Marker
- Pliers
- Screwdriver
- Downspout elbow and extension
- **For straight pipe (see Step 5):** Rubber cap with hose clamp
- **For bell pipe (see Step 4):** Concrete, chicken wire, newspaper, and a bucket



### Maintenance

Proper maintenance of gutters, downspouts, and landscaping is relatively simple and can help to reduce problems:

#### Gutters:

- Clean at least twice per year, more often if there are overhanging trees.
- Make sure gutters are pitched to direct water to downspouts.
- Caulk leaks and holes.
- Make sure roof flushing directs water to the gutters.

- Look for low spots or sagging areas along the gutter line and repair with spikes or place new hangers as needed.

#### Downspouts:

- Check and clear elbows or bends in downspouts to prevent clogging.
- Each elbow or section of the downspout should funnel into the one below it. All parts should be securely fastened together with sheet metal screws.
- Use downspout extenders to discharge water onto a permeable surface away from structures.

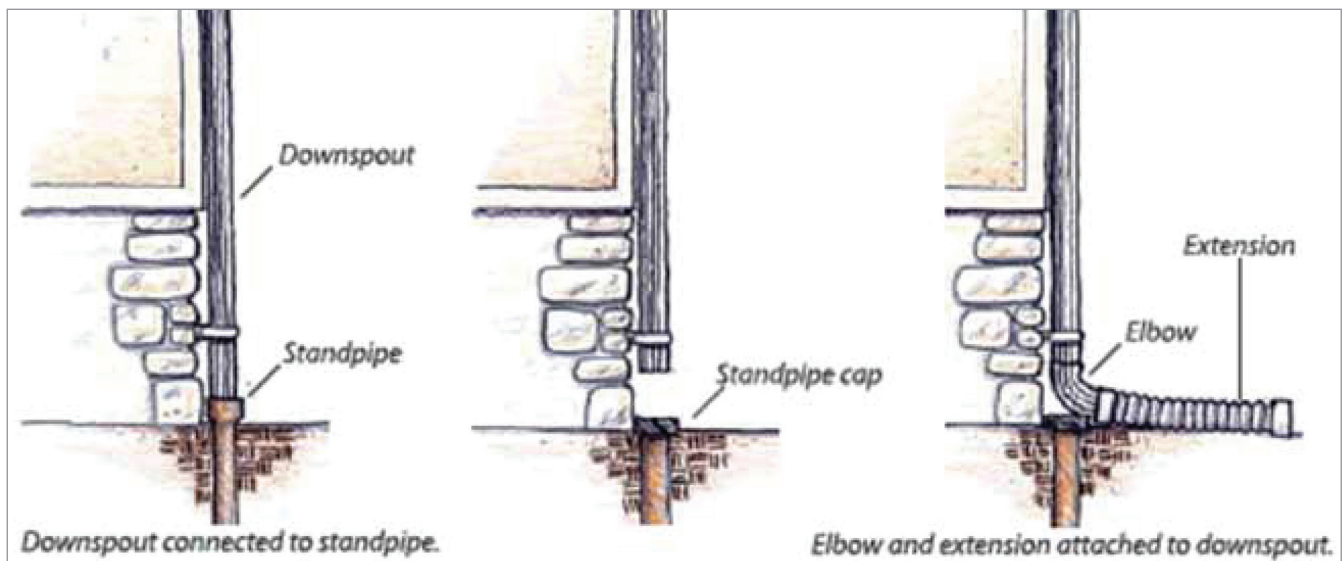
#### Landscaping:

- Check for evidence of erosion at discharge point and immediately after-stabilize areas as necessary.
- The ground should slope away from structures.
- Do not build up soil, bark, dust, or woodpiles against structures.
- Avoid draining water into impermeable plastic, blocks, or cloth.



## Permitting

For non-residential customers, the City's Building Safety Engineering and Environmental Department (BSEED) should be contacted at 313.224.2733 for current permitting requirements. A permit is not required to perform downspout disconnections for residential customers. Any other City, State, or Federal permitting requirements must be followed.



*This diagram provides a simple illustration of an externally connected and disconnected downspout. The process to disconnect is simple. Once disconnected, the extension needs to be directed 5 feet away from the foundation.*



*Directing your disconnect downspout to a rain garden can result in additional credits. In the photos, a simple rock lined channel is used to direct the stormwater into the rain garden. The rock channel functions as the extension and provides a natural aesthetic property enhancement. A downspout extender or underground pipe could also be used to direct water to the rain garden.*

## Additional Resources

For Drainage Charge Credit Information and other resources, visit the drainage webpage: [www.detroitmi.gov/drainage](http://www.detroitmi.gov/drainage)

Specific documents to review:

- ◆ Guide to Drainage Credits
- ◆ Guide to Credits for Commonly Used Stormwater Management Practices
- ◆ Credit Calculator
- ◆ Credit Application

Uncontrolled document when printed. Refer to website for most current version.