

STORMWATER MANAGEMENT TOOLS FOR RESIDENTIAL DEVELOPMENT

TOOL ① INFILTRATION CHAMBERS

WHAT IS AN INFILTRATION CHAMBER?

The infiltration chamber is a below-ground container with a permeable bottom. It is designed to temporarily hold stormwater (rainwater) and allow it to slowly seep into the ground. It can be located below lawn, planting beds, pathways or patios. The infiltration chamber is the preferred method for stormwater management for one and two dwelling properties in the City of North Vancouver. The CNV no longer allows the use of rock pits for infiltration.

An infiltration chamber is commonly made of plastic panels to create rectangular structures, a large diameter plastic pipe or could be other shapes, and is available in various sizes to fit your space. The chamber needs to be at least 5m away from house foundations, but this does not apply if the building is at-grade (e.g. garage). A PVC liner should be used between the chamber and the house to limit water from seeping towards your house.



StormTank Arch infiltration chamber

The infiltration chamber is well suited to only receive rain from rooftops. It can be located underground and placed under almost any surface. Roof water is directed into a series of sumps (i.e. below-ground tanks with maintenance access) where sediment can settle out before the water goes into the infiltration chamber. Flow split sumps are a key component of the system to allow simple overflow.

Overflow from the chamber is directed into the City's storm sewer system. The infiltration chamber needs to incorporate at least one inspection point, which the City's plumbing inspector will use to verify that the system is working.

Refer to the **CNV website** [www.cnv.org/drainage] to see which tool is most suitable for your property or go to the **infiltration chamber worksheet** [www.cnv.org/infilchamber] for directions on how to choose the right size of chamber for your property.

WHERE CAN I GET THE PARTS I NEED?

The following local companies can supply you with an infiltration chamber and help you figure out the correct style and size based on your property:

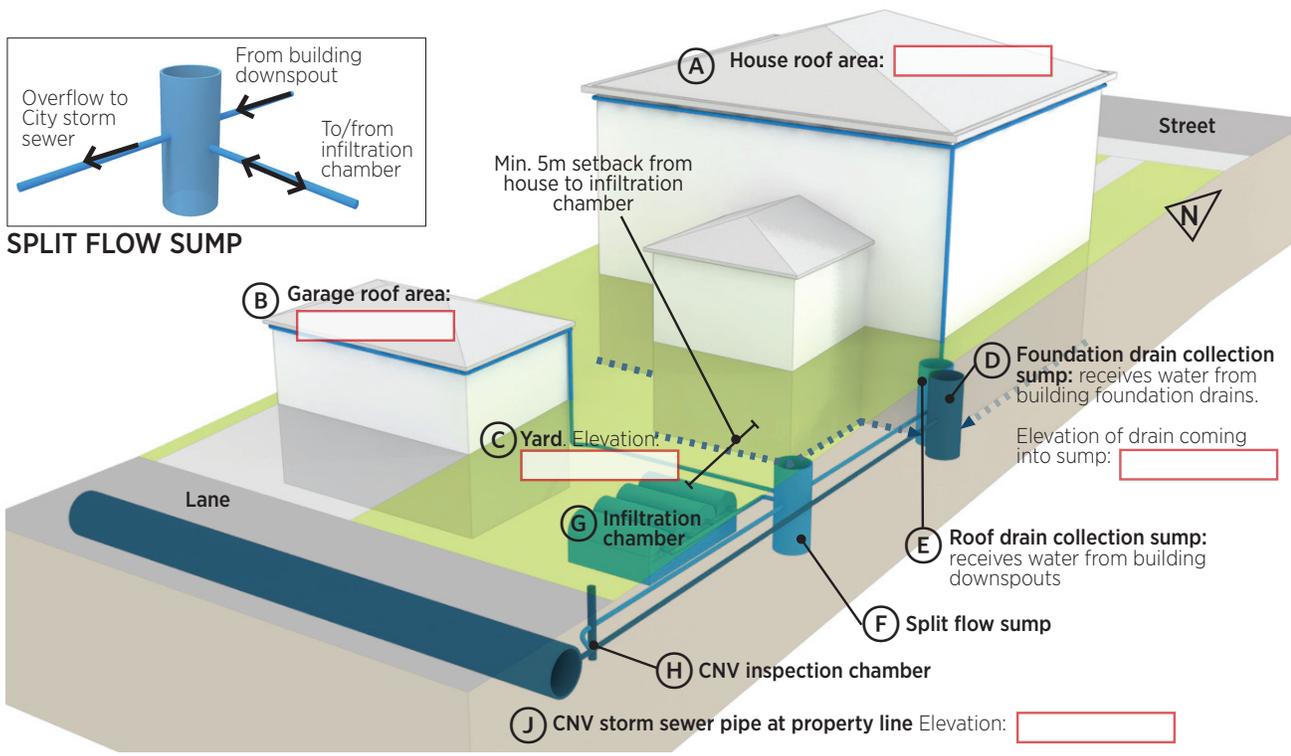
- **StormTank** infiltration system product line (includes Arch, Module, or Pack). Distributed locally by Layfield Group: 604-243-3329
- **Cultec Stormwater Chamber** (Contactor, Recharger, or Landscaper series). Distributed locally by Nilex: 604-420-6433
- **GRAF EcoBloc** infiltration modules (Inspect Flex, Maxx or Light). Distributed locally by BARR Plastics: 604-852-8522

WHERE DO THE TOOLS GO ON MY PROPERTY?

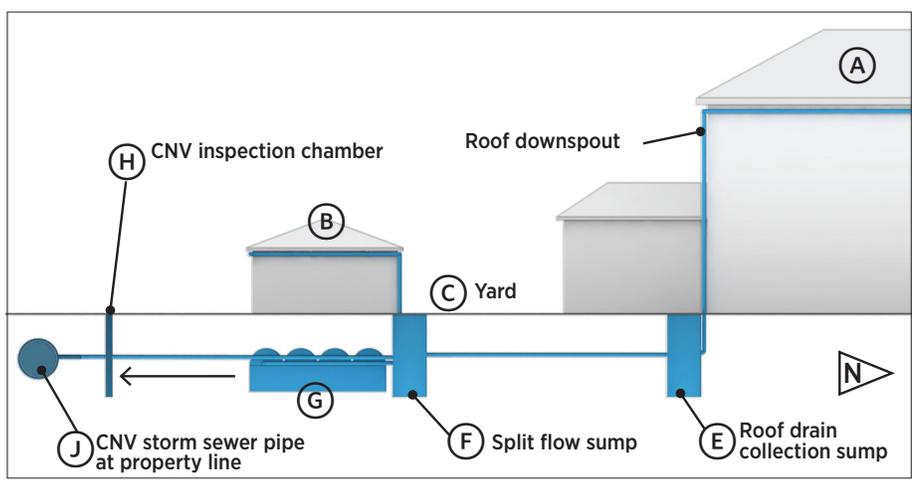
The illustrations on the following pages show how drain pipes and an infiltration chamber could be laid out on a typical residential lot. Two examples are given: one for a typical south-facing lot and one for a typical north-facing lot.

In the north-facing lot the infiltration chamber is in the backyard, as that will typically be the low point of the site. Likewise, in the south-facing lot the infiltration chamber will typically be in the front yard. The circled letters correspond to different parts of the accompanying infiltration chamber worksheet.

INFILTRATION CHAMBER ON A TYPICAL NORTH-FACING LOT



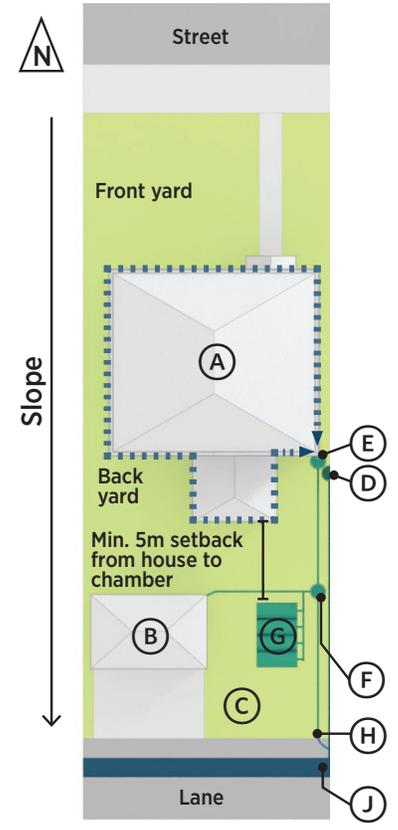
PERSPECTIVE VIEW



SECTION Note: foundation drain sump connection to CNV storm sewer pipe not shown

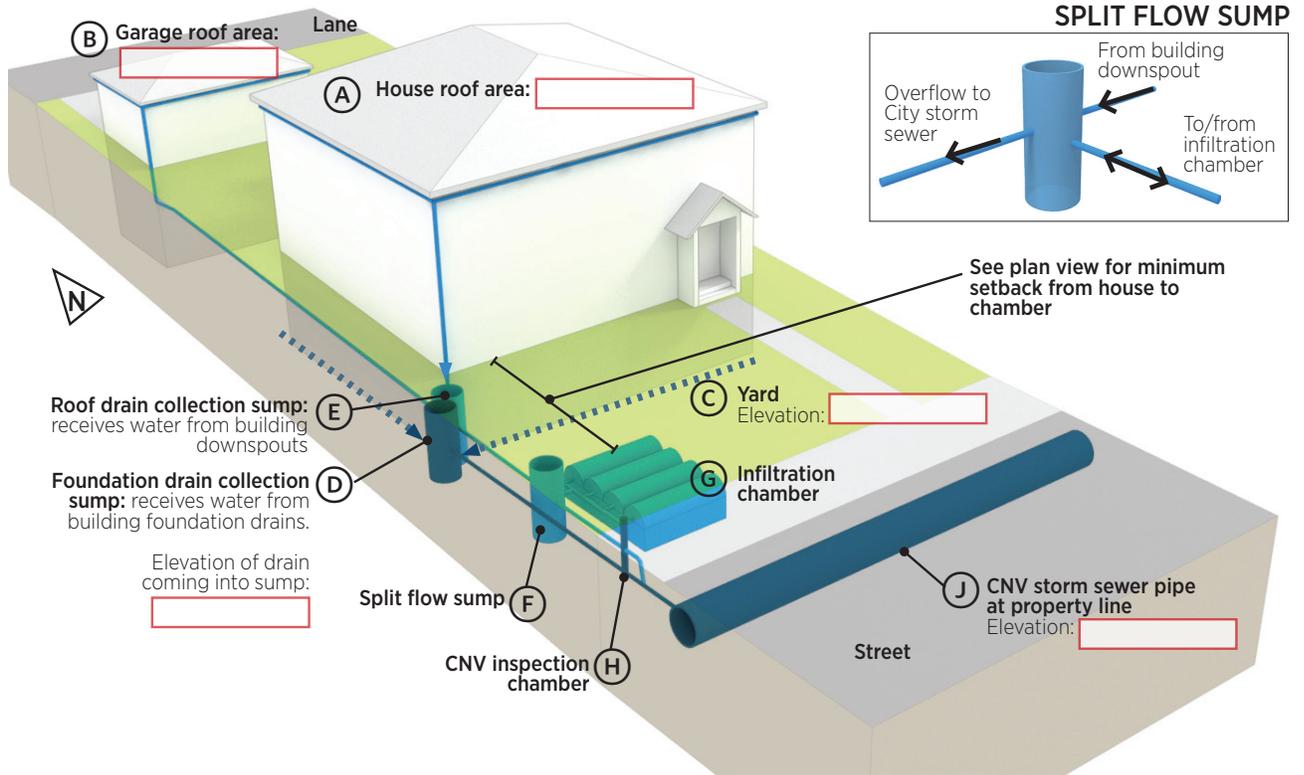
LEGEND:

- **Perforated foundation drain pipe:**
Drains water to foundation drain sump (D). Minimum 1% slope.
- **Solid foundation drain pipe:**
Drains directly to CNV storm sewer (J). Minimum 1% slope.
- **Perforated stormwater drain pipe:**
Allows rainwater to infiltrate and soak into ground. Minimum 1% slope.
- **Solid stormwater drain pipe:**
Minimum 1% slope.

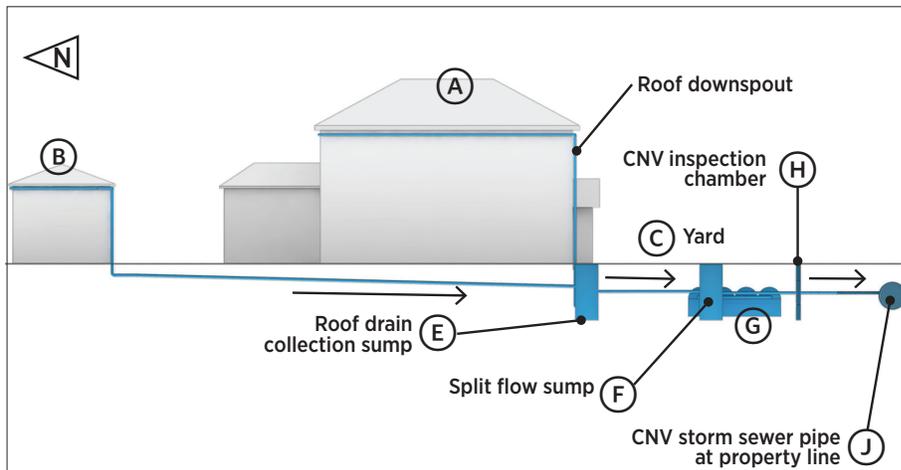


PLAN VIEW

INFILTRATION CHAMBER ON A TYPICAL SOUTH-FACING LOT



PERSPECTIVE VIEW

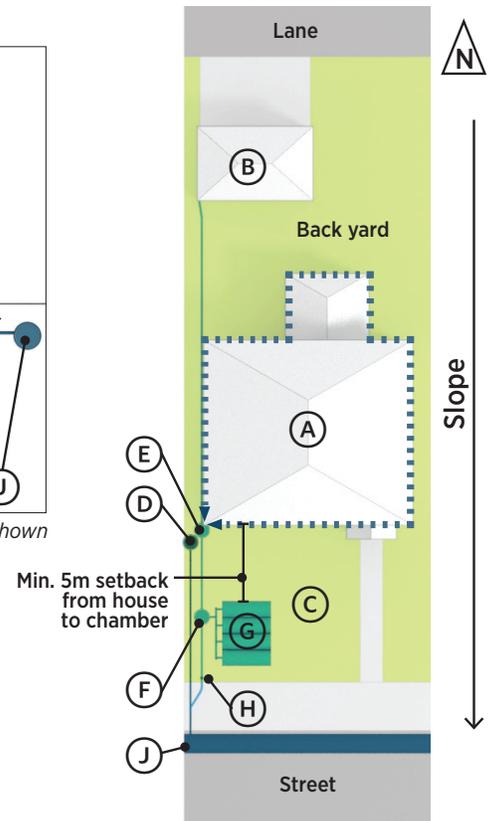


SECTION

Note: foundation drain sump connection to CNV storm sewer pipe not shown

LEGEND:

- **Perforated foundation drain pipe:**
Drains water to foundation drain sump (D). Minimum 1% slope.
- **Solid foundation drain pipe:**
Drains directly to CNV storm sewer (J). Minimum 1% slope.
- **Perforated stormwater drain pipe:**
Allows rainwater to infiltrate and soak into ground. Minimum 1% slope.
- **Solid stormwater drain pipe:**
Minimum 1% slope.



PLAN VIEW

HOW BIG DOES MY INFILTRATION CHAMBER NEED TO BE? (WORKSHEET)

BEFORE COMPLETING THIS WORKSHEET:

- Review the stormwater management tool [flowchart](#) to determine if this tool is right for you [\[URL\]](#)
- Collect your **building site plans and drawings**
- Contact the City of North Vancouver to get the elevation of the **City's storm sewer at your property line**
- Calculate your **soil's infiltration rate** using the directions on the CNV website [\[URL\]](#)

REQUIRED INFORMATION AND CALCULATIONS:

- Note that the circled letters below correspond to the diagrams on the previous pages
- Enter your answers into the shaded fields below
- Transfer the numbers next to the circled letters to the appropriate diagram above
- Submit a copy of your building site plan showing the proposed locations of your infiltration chamber and connecting pipes.

① Enter your address:

② What is your house roof area? **(A)** m² Your garage roof area? **(B)** m² **(A) + (B)** m²

③ What is your soil infiltration rate? mm / hr
(Note: If you are not able to calculate your soil infiltration rate, enter the default rate of 10 mm per hour. If you use the default rate you may end up with a larger chamber than required).

④ What is the elevation (grade) of your yard where the infiltration chamber will be installed? **(C)** m
(Note: multiply feet by 0.3048 to get the value in meters)

⑤ What is the elevation (grade) of your house's roof drain sump? **(E)** m
(Note: typically equals the elevation of the house corner minus 0.4m)

⑥ What is the elevation (grade) of the City storm sewer at your property line? **(J)** m
(Note: contact the City to get this value if not already built)

⑦ Check: is the value you entered for **(E)** at least 0.3 m (1 foot) higher than **(J)**? (check one) Yes No
 If not, this stormwater tool will not work for your property. Contact the City for guidance.

⑧ Use the sizing table below to determine the required area of your infiltration chamber (assumes chamber height of 0.9m):

- Put a check mark next to the roof area that matches yours (area **(A) + (B)**, above). If your roof area is in between two sizes, select the bigger size.
- Put a check mark next to the soil infiltration rate that matches yours or use the default rate of 10 mm per hour.
- Based on the selected roof area and infiltration rate, use the table to find the corresponding infiltration chamber area. For example, with a roof area of 200 m² and a soil infiltration rate of 10 mm / hr the infiltration chamber will need to have an area of 8 m². If you don't have space to accommodate an infiltration chamber of this size, go back to the flowchart to find an alternate solution or contact the City for guidance.

Soil infiltration rate (mm / hr)	<input type="checkbox"/> Total roof area: 200 m ² (or 2,150 ft ²)	<input type="checkbox"/> Total roof area: 250 m ² (or 2,700 ft ²)	<input type="checkbox"/> Total roof area: 300 m ² (or 3,200 ft ²)
<input type="checkbox"/> 10 mm / hr	<input type="checkbox"/> 8 m ²	<input type="checkbox"/> 9 m ²	<input type="checkbox"/> 11 m ²
<input type="checkbox"/> 25 mm / hr	<input type="checkbox"/> 6 m ²	<input type="checkbox"/> 7 m ²	<input type="checkbox"/> 9 m ²
<input type="checkbox"/> 50 mm / hr	<input type="checkbox"/> 4 m ²	<input type="checkbox"/> 5 m ²	<input type="checkbox"/> 6 m ²

⑨ Calculate the elevation of the bottom of your infiltration pit by subtracting 1.4m from the value you recorded for question **(4)** above m

⑩ Write any additional details about your stormwater management approach, including information about your selected infiltration chamber type, the final dimensions of your infiltration chamber (length x width), or other details.