



Institute for Catastrophic  
Loss Reduction

Building resilient communities

Designed for safer living®

*Protect your home from*

# Basement flooding

*Designed for safer living® is a program endorsed  
by Canada's insurers to promote disaster-resilient homes.*



## About the Institute for Catastrophic Loss Reduction

The Institute for Catastrophic Loss Reduction (ICLR), established in 1997, is a world-class centre for multidisciplinary disaster prevention research and communication. ICLR is an independent, not-for-profit research institute founded by the insurance industry and affiliated with the University of Western Ontario.

The Institute's mission is to reduce the loss of life and property caused by severe weather and earthquakes through the identification and support of sustained actions that improve society's capacity to adapt to, anticipate, mitigate, withstand and recover from natural disasters.

ICLR's mandate is to confront the alarming increase in disaster losses caused by natural disasters and to work to reduce disaster deaths, injuries and property damage. Disaster damage has been doubling every five to seven years since the 1960s, an alarming trend.

The greatest tragedy is that many disaster losses are preventable. ICLR is committed to the development and communication of disaster prevention knowledge. For the individual homeowner, this translates into the identification of natural hazards that you and your home are vulnerable to. The Institute further informs individual homeowners what steps may be followed to better protect your family and your home.

**The purpose of this handbook** is to outline steps that you can take to protect your home from basement flooding. Some of these measures are simple and free; others cost money. All contribute to reducing the risk of basement flooding.

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# Start reducing your risk of basement flooding

## Quick and free things everyone can do to reduce the risk of basement flooding

There are some easy and free things that you can do to reduce the risk that your home is flooded.

- 1 Never pour fats, oils and grease down your drains!**
- 2 Reduce home water use during heavy rains.**
- 3 Keep the storm sewer grates on your street clear of yard waste, leaves, garbage, ice and snow.**
- 4 Clean and maintain your eavestroughs and downspouts at least once a year.**
- 5 Do not finish your basement.**
- 6 Store anything expensive, valuable or irreplaceable upstairs.**

These are some initial steps to prevent basement flooding. However, if you have had water in your basement in the past then you need take more significant steps to protect your home.

## Five reasons you should invest in ways to protect your home

- 1** If water got into your home before, it could get in **again** unless you take action.
- 2** Overland flood damage is **not covered** by your home insurance policy. A small cost now can save you a lot of money after the flood.
- 3** Floods may have long-term **health impacts** on your family if they cause moulds to grow.
- 4** Homes in older neighborhoods are usually **more vulnerable** than homes in newer neighborhoods.
- 5** Climate change scientists report that severe **rain storms** are occurring more often in many parts of Canada, and they are expected to continue to increase in frequency and severity.

# First steps

## 1. Talk to your local government.

The first step is to visit your municipal government's website or contact the public works, utilities or building department to find out about their programs on reducing basement flooding.

- ▶ What **advice** do they offer?
- ▶ Are there **engineering studies** on your subdivision?
- ▶ How do you **report** basement flooding to them?
- ▶ What does your local government **suggest** you do?
- ▶ Do they offer any **financial assistance** programs for plumbing installations?
- ▶ Do they **recommend** contractors or plumbers?
- ▶ What **permits** do you need in order to begin?

## 2. Talk to your insurer or broker.

Talk to your insurance company or broker to find out about what types of water damages are covered under your policy. Trying to make a claim after you have suffered water damage is not a good way to find out that you don't have the proper coverage, or that overland flooding is uninsurable.

## 3. Get a plumber to conduct a plumbing investigation of your home

Each home is unique. A plumber or contractor who is fully versed in home and municipal drainage systems can best help you protect your home. Understanding the risks of basement flooding and the nature of your plumbing and sewer connections will help to ensure that the best course of action is taken to reduce future water damage in your home. Your municipality may help you find a plumber.



# 1. Taking action on your own

## **Seal cracks in foundation walls and basement floors**

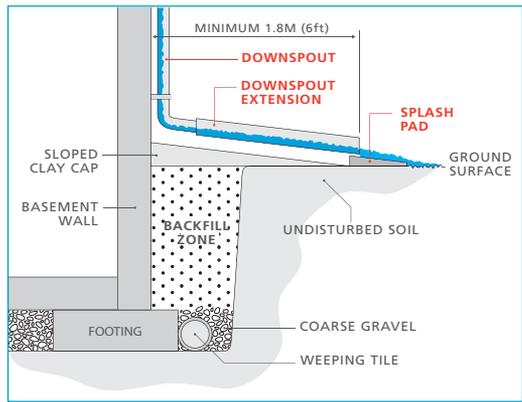
Sealing cracks is a simple way to help reduce basement flooding in your home. In many cases, cracks can be effectively sealed from inside. Most of the time, you should not have to dig anywhere beside the foundation to repair them.

## **Disconnect your downspouts, add extensions and splash pads**

Downspouts are designed to convey water from eavestroughs and down the side of the house. Downspouts often direct water to the surface of the lot, but in many cases they may be connected to the weeping tile or the sanitary sewer lateral.

- Downspout extensions should be directed at least 1.8 metres (6 ft) away from the home, and the flows should be directed over permeable surfaces, such as lawns or gardens, and not paved surfaces including driveways or walkways.
- Talk to your municipal government **before** you do this.

### **Downspout extension**



When connected to the municipal sanitary sewer system, eavestrough downspouts can contribute a substantial amount of water to these systems. Because of the environmental impacts resulting from **combined sewer overflows** and the increase in basement flooding risk that connected eavestroughs cause, it is illegal to connect downspouts to municipal sewer systems in many Canadian communities.



*If your downspout looks similar to these, chances are it is connected to your weeping tile or the municipal sanitary sewer system and should be changed.*

## 2. Questions for a plumber

In many cases, it is the more substantive measures that are the most effective way to reduce basement flooding. Many of these require the assistance of a licensed plumber. Municipal governments often require permits for the plumbing and drainage improvements described in this document. Talk to your municipal government to make sure you or the person you have hired have the proper permits.

### ***Is poor grading causing my flooding?***

The slope of your yard is very important to keep water away from your home and foundation. This helps keep the basement dry. You should:

- Check your lot to see if your yard slopes away from your home. Look **everywhere**, including under stairs and decks.



*Typical backyard swale with a drain.*

The soil directly beside your foundation wall should be approximately 10 cm to 15 cm higher than the soil 1.5 metres away from the foundation.

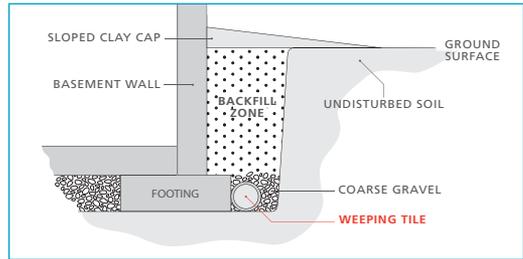
- If you notice that the ground close to the foundation of your house has settled beside your foundation wall, fill it in with a solid, compactable soil – like clay – so that there is a constant slope away from the foundation.
- Talk to the department in your municipal government that is responsible for building inspections and stormwater drainage about swales (the grassy depressions that help direct water away from homes) and lot grading. Ask them where swales should be on your property, and where water from your lot should be directed.

### ***Do I have a weeping tile?***

A weeping tile or foundation drain is an underground perforated pipe that runs along the bottom of a home's foundation. Older Canadian homes, for example those built before the 1940s or 1950s, may not have foundation drains. If you find that your home does not have a foundation drain and you experience serious infiltration flooding, you should consider having a foundation drain installed.

If you do have a foundation drain, it can become clogged with debris or collapse in some sections. A plumber will need to decide if it can be fixed or it needs to be replaced. If a plumber does fix or replace the weeping tile, ICLR recommends including a clean-out port with access from the surface to allow easier maintenance in the future.

### Weeping tile installation



#### **A** *What is my weeping tile connected to?*

A weeping tile that is directly connected to your home's sanitary sewer lateral increases the amount of water that enters the municipal sewer system during a heavy rainfall. Disconnecting your weeping tile from the sanitary or storm sewer can help reduce the chances that you and your neighbours will experience basement flooding. It can also reduce the risk of structural damage to your home.

#### Legend

**A B C D E**

Please refer to the illustration on the next page.

#### **B** *Do I have a sump-pump?*

When weeping tiles are disconnected from sewer laterals, a sump-pit and sump-pump must be installed. The sump-pump is used to pump water from the weeping tiles to the lot's surface. In some unique cases, municipalities may recommend a sump-pump to pump weeping tile water to the storm sewer system.

#### *Is my sump-pump working correctly?*

Sump-pumps get blocked and can fail if they are not routinely inspected and maintained. On-going maintenance helps to ensure the sump-pump keeps working long term. You can inspect the sump-pump by pouring water into the sump pit, and seeing whether or not the pump starts automatically.

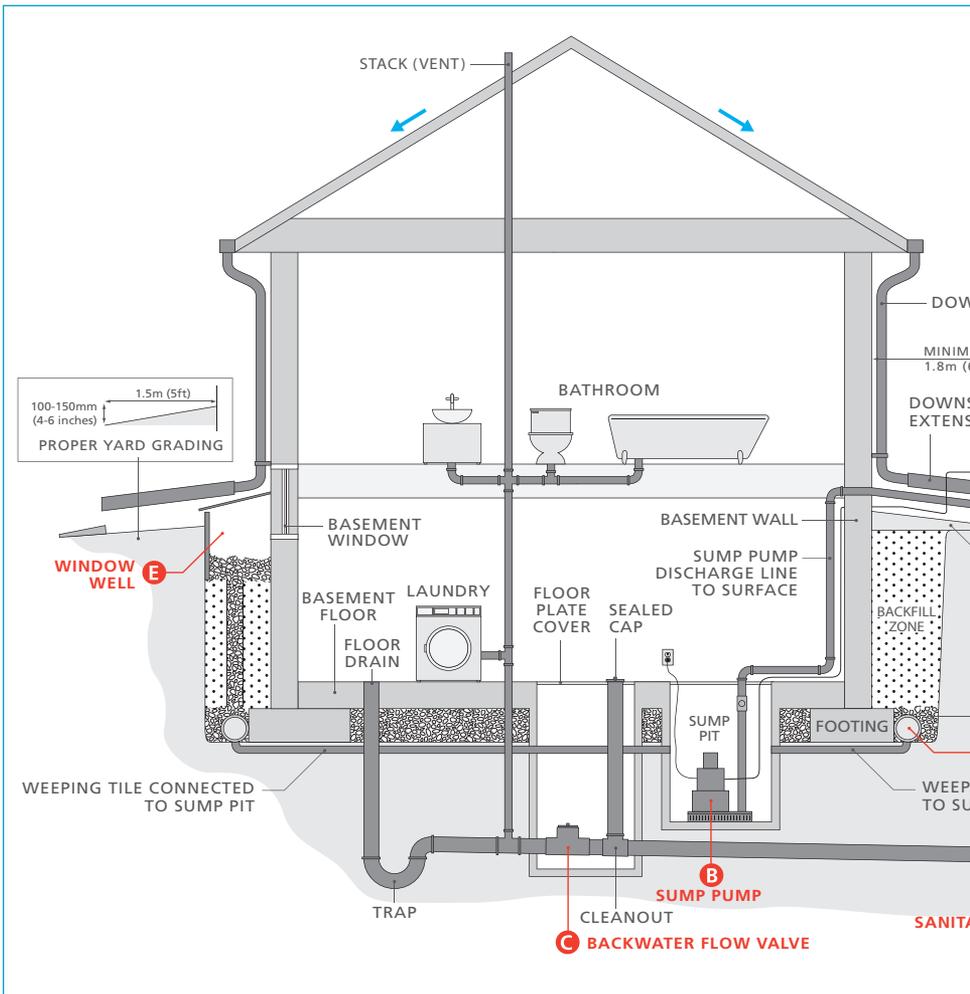
#### Gasoline powered generator



Sump pumps need electricity. They **stop working** during a power failure. You should use a back-up system to make sure the pump works when you need it. Talk to your plumber or electrician about options.

**C Do I need a backwater valve?**

A mainline backwater valve is placed directly into the sewer lateral at the foot of your basement wall. The device allows sewage to flow in only one direction – out of your house. When sewage begins to move toward your basement, the valve closes. Some municipalities offer subsidies to offset the cost of installing a backwater valve. Make sure you install the type of valve recommended by your municipality. Installation of the backwater valve may reduce the cost of insurance or be required as a condition of insurance.



Some municipalities have backwater valve rules. In most cases they require the normally open (or open-port) mainline backwater valve. This valve is installed directly into the sanitary sewer lateral, and serves to protect all home plumbing fixtures from sewer backup.

**When installing backwater valves:**

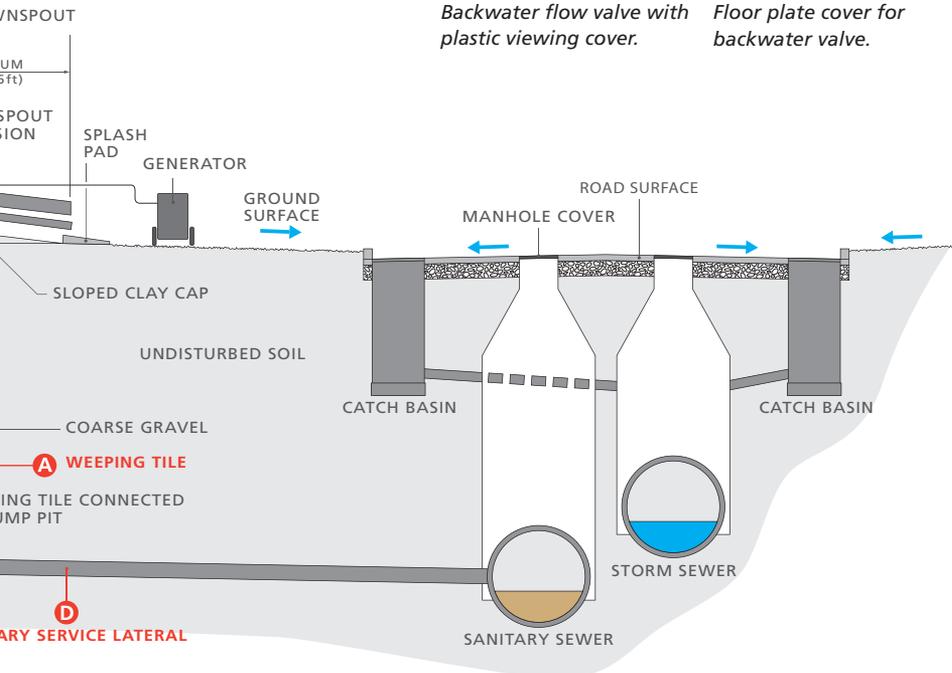
The valve should be installed based on the manufacturer's installation instructions, which have specifications for placement and grading.



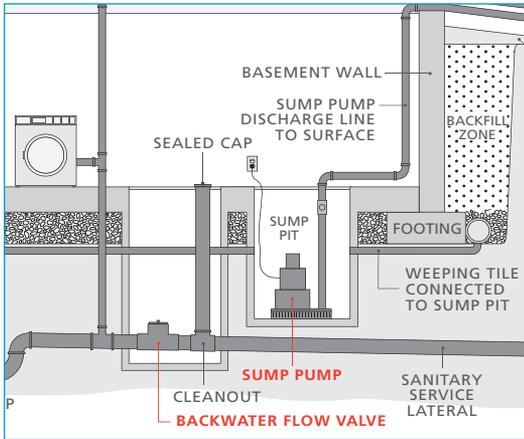
*Backwater flow valve with plastic viewing cover.*



*Floor plate cover for backwater valve.*



## Backwater valve and sump pump



Proper placement and installation of the backwater valve is extremely important. If placed in the wrong location relative to other plumbing fixtures on the sanitary lateral, the valve could be bypassed and provide no protection. If the valve is placed in the wrong location, sewer backup pressure can build up and crack the basement floor and lead to flooding.

If the weeping tiles are still connected to the sanitary sewer lateral downstream of the valve, sewage could be forced back into the weeping tiles and lead to structural damage to the foundation, this can also lead to infiltration flooding.

Like other parts of your home, backwater valves require periodic maintenance to ensure proper performance. An improperly maintained valve may fail during a flood. Most mainline backwater valves come with a see-through top so you can check to see if it is clogged with debris. The valve should be checked regularly to ensure that it will function properly when it is needed. You will likely need the help of a qualified plumber to carry out maintenance of the valve.

After a backwater valve has been installed do not use plumbing, for example, flushing toilets, running dishwashers, washing machines, or running taps, etc. during intense rainfall events. If the home plumbing is used when the backwater valve is closed, water will have no way to exit your home until the valve has reopened. If you're not sure if the valve is closed, check it – you should be able to see it through the clear, plastic top.

**D** *Are my sewer laterals working properly?*

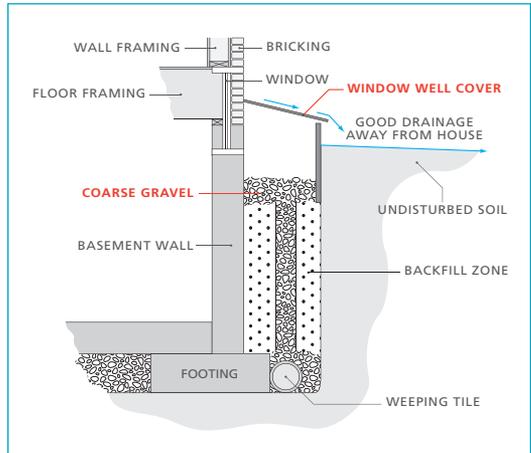
Sewer laterals, the pipes that connect a home's plumbing system to the municipal underground sewer system, should be regularly maintained. Over time, the sanitary sewer lateral can get clogged with fats, oils and grease (FOGS) or other debris, which can restrict flows and cause sewer backup. This may especially be a problem in older homes when the lateral has not been routinely maintained. Sewer laterals are accessed through the cleanout port, which may be located either inside of the basement or outside of the home, close to where the lateral enters the home.

To find out how well your sanitary sewer lateral has been maintained, you should talk to a licensed plumber who can carry out a camera inspection of your lateral. A plumbing inspection will identify if it is contributing to your flood risk. Some communities recommend that homeowners replace their sewer lateral every 30 years or so.

**E** *Basement windows*

If your basement windows are close to the surface of the ground, window wells and window well covers can reduce the crevices that allow water to enter. The outer edges of the window well should fit snugly against the wall. The bottom of the well should be 15 cm below the underside of the window with a mixture of gravel and sand to allow drainage.

**Window well and cover**



### 3. Measuring your risk of basement flooding

Assign yourself the indicated number of points for each question. The fewer the points you get, the more prepared your property is to prevent flooding. If a question does not apply to your home, score 0.

Has your basement ever flooded?	Yes Don't know No	25 5 0	
Do you pour fats and cooking oils and grease down the sink?	All the time Sometimes Never	5 5 0	
Are the sewer grates in front of your home clear of debris?	Yes No	0 5	
Have you cleaned your eaves and downspouts within the past year?	Yes No	0 5	
Are there any unsealed cracks in your foundation or basement floor?	Yes No	15 0	
Are your downspouts directing water 1.8 metres (6 feet) away from your home?	Yes No	0 10	
Is the soil directly beside your home 10 to 15 cm higher than the soil 1.5 metres away from the home?	Yes No	0 10	

Does your home have a backwater valve?	Yes No	0 15	
Does your home have a sump-pump?	Yes No	0 5	
Have you tested the sump-pump in the last 12 months?	Yes No	0 5	
Does your sump-pump have a back-up power source?	Yes No	0 5	
Are any of your eavestrough downspouts connected to the municipal sewer system?	Yes No	5 0	
Do you have a reverse sloped driveway?	Yes No	15 0	
Do you have basement windows close to the surface of your lot?	Yes No	15 0	
<b>My total Risk Score is ►</b>			

**Low** 21 or less, **Moderate** 21 to 29,  
**High** 30 to 35, **Extreme**, 35 or more

**Notes**

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# Repair or upgrade to-do-list

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## Description

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Location

Start date

Completed

Repair    Upgrade    Replace

\$ Budgeted

Actual cost

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## Description

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Location

Start date

Completed

Repair    Upgrade    Replace

\$ Budgeted

Actual cost

---

## Description

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Location

Start date

Completed

Repair    Upgrade    Replace

\$ Budgeted

Actual cost

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## Description

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Location

Start date

Completed

Repair    Upgrade    Replace

\$ Budgeted

Actual cost

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## Important questions

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# Important contact information

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## Insurance company

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Address

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Postal code

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Telephone

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Alternative telephone

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E-mail

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Website

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Contact person

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Contact person

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## Insurance broker

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Address

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Postal code

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Telephone

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Alternative telephone

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E-mail

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Website

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Contact person

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Contact person

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## Municipal government

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Address

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Postal code

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Telephone

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Alternative telephone

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E-mail

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Website

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Contact person

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Contact person

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## Plumber

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Address

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Postal code

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Telephone

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Alternative telephone

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E-mail

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Website

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Contact person

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Contact person



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