



UNIVERSITY OF  
**WATERLOO**

## RESIDENTIAL BASEMENT FLOOD RISK REDUCTION BEST PRACTICES

### Introduction

This document provides a summary of the residential basement flood risk reduction best practices that were featured in the Home Flood Protection Program that delivered 510 Home Flood Protection Assessments to residences in Ontario and Saskatoon from 2016 to 2018. The best practices were developed by the Intact Centre on Climate Adaptation at the University of Waterloo and meet or exceed the Guideline on Basement Flood Protection and Risk Reduction (Z800-18) published by the Canadian Standards Association in 2018. Meeting all of the best practices reduces risk but does not guarantee basement flood prevention.

### Assessment Methodology

The best practices included in this document include a review of physical features that may be assessed at their surface using simple tools such as using measuring tapes, audible moisture meters and flashlights. This list does not include assessment of physical features that are behind walls, below ground or inside of pipes. The frequency of maintenance activities is recorded based on information provided by the resident.

### Scope of the Assessment

The assessment focuses on risks that are within the control of the resident and are on their private property. It focuses on "urban flood risks" including the risk of water flowing over the surface of the land and into the home through gaps, cracks and openings (overland flooding), seepage through foundation walls or gaps and cracks below ground (infiltration flooding) and backup of water into the home through sump pits or sewer pipes (sewer backup flooding). The assessment does not include an evaluation of risks related to the condition and configuration of municipal sewer infrastructure and overland flow routes. It also does not consider flood risks associated with high river levels (riverine flooding) or high lake levels and coastal wave action (coastal flooding).

TABLE OF CONTENTS

Water Damage Risk Type Glossary ..... 1

**Outside Assessment Best Practices..... 1**

A) Overland Drainage of Property ..... 1

B) Landscaping ..... 1

C) Driveways, Walkways, and Patios..... 2

D) Grading at Foundation..... 3

E) Eaves Troughs and Downspouts ..... 3

F) Rain Barrels ..... 4

G) Foundation..... 5

H) Windows ..... 5

I) Doors ..... 6

J) Exterior Water Sources..... 6

**Inside Assessment Best Practices ..... 7**

A) Sewer and Storm Lateral ..... 7

B) Floor Drain ..... 8

C) Backwater Valve ..... 8

D) Foundation Drain (Weepers)..... 9

E) Sump Pit and Pump ..... 9

F) Exposed Foundation Walls, Floors and Cold Rooms..... 10

G) Finished Walls and Floors ..... 12

H) Windows ..... 12

I) Plumbing Fixtures ..... 12

J) Additional Considerations for Limiting Risk of Water Damage, Mold and Mildew Growth ..... 13

K) Hazardous Materials..... 13

## Water Damage Risk Type Glossary:

SB - Sewer Backup;

OW - Overland Water;

GS - Groundwater Seepage;

WS - Water and Sewer Line Rupture;

PF - Plumbing Fixtures

## Outside Assessment Best Practices

### A) Overland Drainage of Property

Category	Water Damage Risk Type	Assessed Feature Name and Key Questions to Ask	Best Practice
Assessed Feature	OW	<b>#1. Overland drainage of property</b> Twenty-four hours after a heavy rain do you see ponding or pooling on your property or in nearby storm drains or drainage ditches?	Twenty-four hours after a heavy rain, water does not pool on the subject property or in nearby storm drains or drainage ditches. If drainage swales are present on the property, they are unblocked and are at least 15cm (6") deep.
Assessed Maintenance	OW	<b>#2. Overland drainage maintenance</b> How often do you remove debris and obstructions from the water flow paths including swales, nearby storm drains, culverts and drainage ditches?	Once per season or when major storm events are predicted, the participant checks for and removes debris and obstructions from the water flow paths including swales, nearby storm drains, culverts and drainage ditches.

### B) Landscaping

Category	Water Damage Risk Type	Assessed Feature Name and Key Questions to Ask	Best Practice
Assessed Feature	SB, WS, GS	<b>#3. Condition and location of trees</b> Would falling limbs due to strong winds or ice accumulation pose any risk of property damage to the home or hydro lines? Does their location pose potential risk to the home's foundation or sewer lateral?	Trees appear to be in good condition. Their limbs do not hang over the home, driveway or hydro lines. Trees are in a position where they likely do not pose a root damage risk to the home's foundation or sewer lateral.
Assessed Maintenance	SB, WS, GS	<b>#4. Tree maintenance</b> How often do you check the condition of your trees? Do you prune trees as required and water during drought periods?	Once per season the participant checks the condition of trees, prunes as required and waters during drought periods.

Assessed Feature	GS	<b>#5. Garden beds adjacent to home</b> Do your garden beds leave a minimum of 20 cm (8") of your foundation exposed? Do foundation plantings provide adequate light exposure and air movement to foundation?	Foundation plantings allow for good light and air circulation between the plantings and the foundation. A minimum 20cm (8") of foundation remains exposed. Trees that will reach a height of 10m (30') or more are minimum of 5m (15') from the foundation and shrubs are minimum of 1.8m (6') from the foundation. Water drains freely away from the foundation.
Assessed Maintenance	GS	<b>#6. Landscaping maintenance</b> How often do you remove barriers which impede water flowing away from the foundation?	Once per year participant removes barriers which impede water flowing away from foundation. Consider applying mulch to garden beds and aerating the lawn to improve the ability of the soil to soak up water.

### C) Driveways, Walkways, and Patios

Category	Water Damage Risk Type	Assessed Feature Name and Key Questions to Ask	Best Practice
Assessed Feature	SB, OW	<b>#7. Reverse slope driveway and garage door(s) below grade</b> Is your below-grade garage door and accompanying drain in adequate condition to reduce flood risk?	The garage door, frame and weather stripping are in good condition. A drain is located on landing and is clear of debris. Water drains in less than 1 hour. The drain does not connect to the sanitary sewer.
Assessed Maintenance	SB, OW	<b>#8. Reverse slope driveway and garage door(s) below grade maintenance</b> How often do you inspect and repair the garage door, frame, weather stripping and drain?	Each season the participant inspects and repairs the garage door, frame and weather stripping. They also repair and clean out the drain as needed.
Assessed Feature	GS	<b>#9. Impermeable (waterproof surface such as asphalt and interlocking pavers) driveway</b> Is your driveway free of cracks and does it slope away from your home at a minimum of 1-2%?	The impermeable driveway directs water away from the foundation (1-2% slope) and is free of cracks and gaps.
Assessed Maintenance	GS	<b>#10. Impermeable (waterproof) driveway maintenance</b> How often do you check for evidence of pooling and ice buildup, repair grading, seal cracks, fill gaps and remove weeds?	Once per season the participant checks for evidence of pooling and ice buildup, repairs grading, seals cracks, fills gaps, and removes weeds.
Assessed Feature	GS	<b>#11. Permeable (water absorbing) driveway</b> Is your driveway functioning adequately to absorb water and direct it away from your foundation?	The permeable driveway directs water away from the foundation and all water drains within 24 hours.
Assessed Maintenance	GS	<b>#12. Permeable (water absorbing) driveway maintenance</b> How often do you check for evidence of pooling, ice buildup, and the growth of weeds?	Once per season the participant checks for evidence of pooling, ice buildup, and the growth of weeds. The participant identifies and addresses the reason for clogging. Weeds and debris are removed as needed.

Assessed Feature	OW, GS	<b>#13. Walkways and patios</b> Do your walkways and patios slope a minimum of 1-2% away from foundation walls? Are they free of cracks and gaps?	Walkway slopes a minimum 1-2% to direct water away from the foundation and is free of cracks and gaps.
Assessed Maintenance	OW, GS	<b>#14. Walkways and patios maintenance</b> How often do you check for evidence of pooling and ice buildup? Is grading repaired, cracks and gaps sealed, and weeds removed?	Once per season the participant checks for evidence of pooling and ice buildup. They repair grading, seal cracks, fill gaps and remove weeds.

#### D) Grading at Foundation Category

Category	Water Damage Risk Type	Assessed Feature Name and Key Questions to Ask	Best Practice
Assessed Feature	OW, GS	<b>#15. Grading at foundation</b> After a heavy rain, does the grading within 1.8m (6') of your foundation walls direct water away or do you see water pooling? Does the foundation surface easily soak up water?	The grading within 1.8m (6') of the foundation slopes a minimum of 5% to direct water away from the foundation. The foundation surface does not easily soak up water.
Assessed Maintenance	OW, GS	<b>#16. Grading at foundation maintenance</b> How often do you check for signs of water pooling or ice formation and correct grading to achieve at least a 5% slope away from the foundation?	Each season the participant checks for signs of water pooling or ice formation and corrects grading to achieve at least a 5% slope away from the foundation.

#### E) Eaves Troughs and Downspouts

Category	Water Damage Risk Type	Assessed Feature Name and Key Questions to Ask	Best Practice
Assessed Feature	GS	<b>#17. Eaves troughs</b> Are eaves troughs adequately sized and in adequate condition to reduce flood risk?	Eaves troughs wrap around the entire building, are in good repair, and have downspouts placed a minimum of every 9-12m (30-40'). Eaves trough of 13cm (5") is present for asphalt shingles or 15cm (6") for metal roof.
Assessed Maintenance	GS	<b>#18. Eaves trough maintenance</b> How often do you check the eaves troughs for leaks, debris and blockages? Are repairs and debris removal completed as needed?	Each season during heavy rainfalls, the participant checks the eaves troughs for leaks, debris and blockage. Repairs and debris removal are completed as needed.

Assessed Feature	SB	<b>#19. Connected downspouts</b> Are downspouts connected to SANITARY OR STORM sewers?	Where approved by government department having jurisdictional authority, downspouts should be disconnected from foundation drains, caps should be installed over underground pipe connections and downspouts should be extended to at least 1.8-3m (6-10') from the foundation or to the nearest drainage swale. Water should not drain onto hard surfaces or onto adjacent properties. Note: Check with the government department having jurisdictional authority to determine eligibility for downspout disconnection and any available subsidy.
Assessed Feature	GS	<b>#20. Disconnected downspouts</b> Are downspouts (that are not presently connected into underground pipes) directing water at least 1.8m (6') away from your home or the nearest drainage swale? Is water directed onto hard surfaces or adjacent properties?	For downspouts that have been disconnected, caps are securely in place to block the movement of water into underground pipes. Downspouts extend at least 1.8m (6') away from the foundation or to a drainage swale. Water is not directed onto hard surfaces or adjacent properties.
Assessed Maintenance	GS	<b>#21. Downspout maintenance</b> How often do you check to make sure the downspout extensions are secured, free of leaks, depositing water at least 1.8m (6') from the foundation or to a drainage swale, and that water is not flowing onto adjacent properties?	Once per season the participant checks to make sure that the downspout extensions are secure, free of leaks, depositing water at least 1.8m (6') from the foundation or to a drainage swale, and that water is not flowing onto adjacent properties.

#### F) Rain Barrels

Category	Water Damage Risk Type	Assessed Feature Name and Key Questions to Ask	Best Practice
Assessed Feature	GS	<b>#22. Rain barrels</b> Are rain barrels installed to prevent overflow?	The rain barrel has a diverter and overflow discharge pipe that delivers water at least 1.8m (6') from the foundation or to a drainage swale..
Assessed Maintenance	GS	<b>#23. Rain barrel maintenance</b> How often do you check the rain barrel for leaks, check that the diverter is kept free of debris, and that the overflow pipe extends away from foundation and/or to a drainage swale?	Once per week during the growing season, the rain barrel is checked for leaks, the diverter is kept free of debris, and the overflow pipe is checked to make sure it extends away from foundation and/or to a drainage swale. Before winter, the barrel is drained and the downspout extensions are reinstalled (if applicable)..

**G) Foundation**

Category	Water Damage Risk Type	Assessed Feature Name and Key Questions to Ask	Best Practice
Assessed Feature	GS	<b>#24. Foundation structure</b> Is your foundation free of cracks and gaps? Are the foundation penetrations well sealed and do they sit above anticipated flood levels?	The foundation appears to be in good condition and is free of cracks and finishing gaps (e.g. no missing parge coat). The foundation penetrations are well sealed and sit above anticipated flood levels.
Assessed Maintenance	GS	<b>#25. Foundation structure maintenance</b> How often do you check for cracks and gaps in the foundation?	Once per season the participant checks for cracks and gaps, and completes repairs as required.
Assessed Maintenance	GS	<b>#26. Foundation clearance maintenance</b> How far from the foundation are stored items kept? Is snow cleared from the foundation? Are window openings and vents kept clear?	Stored items are kept at least 15cm (6") from the foundation. As dictated by snow storm events, the participant clears snow 1m (3'6") away from the foundation, keeps window openings clear of snow piles and ensures that vents are clear.
Assessed Feature	GS	<b>#27. Foundation efflorescence</b> Are there signs of efflorescence on the foundation that could indicate moisture problems? Efflorescence (mineral deposits) indicate water moving through masonry, evaporating and leaving minerals behind. The presence of efflorescence can indicate water issues that can lead to spalling or structural damage.	There is no evidence of efflorescence.
Assessed Maintenance	GS	<b>#28. Efflorescence maintenance</b> How often do you check for evidence of efflorescence, address the sources of water buildup at foundation, and clean and repaint the surface with masonry waterproofing paint as required?	Once per season the participant checks for evidence of efflorescence, addresses the sources of water buildup at the foundation, cleans and repaints the surface with masonry waterproofing paint as required.
Assessed Feature	GS	<b>#29. Foundation moisture content</b> Is your foundation showing high levels of water retention?	Low levels of moisture at the surface are indicated.

**H) Windows**

Category	Water Damage Risk Type	Assessed Feature Name and Key Questions to Ask	Best Practice
Assessed Feature	OW	<b>#30. Condition of windows</b> Are windows in adequate condition to help reduce risk of basement flooding?	Frames, glass and seals are all in good condition.
Assessed Maintenance	OW	<b>#31. Window maintenance</b> How often do you check the condition of the frames, glass and seals, and complete repairs as necessary?	Once per season the participant checks the condition of the frames, glass and seals, and completes repairs as necessary.

Assessed Feature	OW	<b>#32. Window wells</b> Are window wells installed in such a way that they reduce flood risk?	For each window that is less than 10-15cm (4-6") above the ground surface, a window well is present, sits at least 10-15cm (4-6") above grade, is sealed at the foundation, and grading adjacent to wells slopes away from the home at a minimum of 5%. Consider installing window well covers to further reduce risk.
Assessed Maintenance	OW	<b>#33. Window well maintenance</b> How often do you remove debris, check and repair seals and drains, check and correct grading and ensure the window well covers are in good condition?	Once per season the participant removes debris, checks and repairs seals and drains, checks and corrects grading, and ensures the window well covers are in good condition. The window well should empty within one hour.

### I) Doors

Category	Water Damage Risk Type	Assessed Feature Name and Key Questions to Ask	Best Practice
Assessed Feature	OW	<b>#34. Doors below grade, stairwells and accompanying drains</b> Are doors below grade, stairwells and accompanying drains in adequate condition to reduce flood risk?	The frame, door, weather stripping and/or water barrier is in good condition. The door sill is 10-15cm (4-6") above grade, the stairs are free of gaps and cracks and a drain on the landing is present. The drain is not connected to sanitary sewer. Consider a stairwell sill that sits 10-15cm (4-6") above grade to further reduce flood risk.
Assessed Maintenance	OW	<b>#35. Door below grade maintenance</b> How often do you check the condition of the seals, barriers, sills, stairs and drains and complete repairs as needed?	Once per season the participant checks the condition of the seals, barriers, sills, stairs and drains and completes repairs as needed. The stairwell should drain within 1 hour.

### J) Exterior Water Sources

Category	Water Damage Risk Type	Assessed Feature Name and Key Questions to Ask	Best Practice
Assessed Maintenance	OW, GS	<b>#36. Hose bib maintenance</b> How often do you check for leaks and complete repairs as necessary? Is the outdoor water supply shut off, the water line drained, and the hose drained and removed before winter?	Spring, summer and fall the participant checks for leaks, and repairs as necessary. Before winter, the outdoor water supply is shut off and the water line is drained. The hose is drained and removed.
Assessed Feature	OW, GS	<b>#37. Sump pump discharge</b> Does your sump pump drain pipe deposit water at least 1.8m (6') from foundation or to the nearest drainage swale? Does your discharge pipe exit the home's exterior above anticipated flood levels?	Sump pump drain pipe is present and deposits water at least 1.8m (6') from foundation or to drainage swale and is not directing water onto a hard surface or adjacent property. The discharge pipe's exit point through the home's exterior is above anticipated flood levels.

## Inside Assessment Best Practices

### A) Sewer and Storm Lateral

Category	Water Damage Risk Type	Assessed Feature Name and Key Questions to Ask	Best Practice
Assessed Feature	SB, WS	<p><b>#38. Sanitary sewer lateral</b> Is your sanitary sewer lateral in good condition and is it free of blockages?</p>	<p>Inspection of sanitary sewer lateral with a closed circuit television (CCTV) is the best practice if a home is over 25 years old, if the home has experienced sewer backup or if the home experiences chronic drain backup.</p> <p><i>Note:</i> Only a qualified professional can formally identify the condition and the connection status of this item.</p> <p><i>Note:</i> Work with a qualified professional and check with the government department having jurisdictional authority to determine the availability and your eligibility for any subsidies.</p>
Assessed Maintenance	SB, WS	<p><b>#39. Sanitary sewer lateral maintenance</b> Is the home over 25 years of age? Is there a history of sewer backup or chronic drainage issues? Have you completed closed circuit television (CCTV) inspection of the sanitary sewer lateral? Have you cleaned out, lined or replaced damaged lateral as needed? Do you prevent fats, oils, flushable wipes and grease from going down the drain?</p>	<p>If the home is over 25 years of age, has experienced sewer backup or has experienced chronic drainage issues, the participant has completed a closed circuit television (CCTV) inspection of the sanitary sewer lateral. Based on the recommendations of a qualified professional, the participant has cleaned out, lined or replaced the damaged lateral as needed. The participant prevents clogging by preventing any of fats, oils, flushable wipes and grease from going down the drain.</p>
Assessed Feature	SB	<p><b>#40. Storm lateral</b> Do you have a storm lateral? Is it in good condition and free of blockages? <i>Note:</i> Storm laterals are rare before 1990.</p>	<p>Homes may have foundation drains directly connected to storm laterals or sump pump discharge pipes directly connected to storm lateral. The presence or absence of a storm lateral in your location can be formally confirmed by a plumber. If your storm lateral is over 25 years old or if storm water is not draining freely, an inspection by a qualified professional with a closed circuit television (CCTV) will help identify your best course of action.</p> <p><i>Note:</i> Only a qualified professional can formally identify the condition of this item, its connection status and if it is best to disconnect it.</p> <p><i>Note:</i> Work with qualified professional. Check with the government department having jurisdictional authority to determine the availability of a subsidy and your eligibility.</p>

Assessed Maintenance	SB, WS	<p><b>#41. Storm lateral maintenance</b> How often do you complete a storm lateral camera inspection?</p>	The participant completes a storm lateral camera inspection if storm water backup occurs, once the lateral is 25 years old and every 5-10 years after that as a preventative measure. Based on the advice of qualified professional the lateral is repaired, replaced or disconnected.
----------------------	--------	---	--

## B) Floor Drain

Category	Water Damage Risk Type	Assessed Feature Name and Key Questions to Ask	Best Practice
Assessed Feature	SB	<p><b>#42. Floor drain</b> Is your floor drain clear of physical barriers to water flow and in adequate condition to reduce flood risk? Note: Some homes built before 1950 do not have a floor drain.</p>	A floor drain is present and demonstrates a clear flow path of water to the drain. The drain appears to be in good condition, is free of debris and standing water is present in trap.
Assessed Maintenance	SB	<p><b>#43. Floor drain maintenance</b> How often do you remove obstacles to water flowing freely to the drain, top up standing water in the trap and remove any debris from the drain?</p>	Each season the participant removes obstacles to water flowing freely to the drain, tops up standing water in the trap and removes any debris from the drain. In case of blockage, strange smell, or lack of water in trap, they contact a licensed plumber.
Assessed Feature	SB	<p><b>#44. Basement sanitary sewer lateral cleanout</b> Is a basement sanitary sewer lateral cleanout present and easily accessible?</p>	A basement sanitary sewer lateral cleanout is present and is easily accessible.

## C) Backwater Valve

Category	Water Damage Risk Type	Assessed Feature Name and Key Questions to Ask	Best Practice
Assessed Feature	SB	<p><b>#45. Backwater valve</b> Is a backwater valve appropriate for use in your home or if it is in place, is it in good condition?</p>	Consider working with a qualified professional to determine if a backwater valve is suitable for your home or to evaluate the condition of your backwater valve. If you have a backwater valve or install one, consider installing an alarm to let you know when the valve is closed to prevent flooding from in-home sources. Note: Only a qualified professional can formally identify if a backwater valve would be right for your home and the condition of an existing unit. Note: Check with the government department having jurisdictional authority to determine the availability of a subsidy for installation and your eligibility.

Assessed Maintenance	SB	<p><b>#46. Backwater valve maintenance</b> How often do you, according to manufacturer's instructions, remove cap, ensure the flapper moves freely, ensure that the gasket is in good condition and remove debris?</p>	Once per season, according to manufacturer's instructions, the participant removes the cap, ensures the flapper moves freely, ensures the gasket is in good condition and removes debris. For repairs, a licensed plumber is contacted. Participant puts NO fats, oil, grease, or flushable wipes down the drain. Consider installing and maintaining a flood alarm to reduce sewer back-up risk from in-home sources.
----------------------	----	--	--

#### D) Foundation Drain (Weepers)

Category	Water Damage Risk Type	Assessed Feature Name and Key Questions to Ask	Best Practice
Assessed Feature	GS, OW, SB	<p><b>#47. Foundation drain</b> Are foundation drain (weepers) present? Is foundation drain functioning properly to drain water away from your foundation? Note: Foundation drains are not common before 1960. Depending on the age of your house it may or may not have a foundation drain or it may have a drain that is old and in poor condition.</p>	Missing or clogged drains increase the risk of basement infiltration flooding. Foundation drains that are connected to sanitary or storm sewers increase the risk of sewer backup related flooding. Note: Only a qualified professional can formally identify the condition of this item or recommend if one would be right for your home. Note: Check with the government department having jurisdictional authority to determine the availability of a subsidy and your eligibility.

#### E) Sump Pit and Pump

Category	Water Damage Risk Type	Assessed Feature Name and Key Questions to Ask	Best Practice
Assessed Feature	SB	<p><b>#48. Sump pit</b> Does your sump pit have a sealed cover and is it in good repair?</p>	The sump pit has a sealed cap, is in good condition (free of cracks and holes) and is free of debris.
Assessed Maintenance	SB	<p><b>#49. Sump pit maintenance</b> How often do you check the sump pit, repair cracks or damage, and remove debris?</p>	Each season the participant checks the sump pit, repairs cracks or damage, and removes debris.
Assessed Feature	OW, GS	<p><b>#50. Sump pump connection</b> Does your sump pump discharge water to the surface of your property and does it have a backflow valve?</p>	The sump pump discharges water to the lot surface and has a backflow preventer installed.
Assessed Feature	SB	<p><b>#51. Sump pump</b> Is your sump pump in good condition and does it run infrequently?</p>	A sump pump is present, the participant reports it is functioning well, and runs a maximum of 5 times per year. Consider installing an alarm to reduce flood risk.
Assessed Feature	SB	<p><b>#52. Back-up sump pump</b> Do you have a backup sump pump and is it in good condition?</p>	A back-up sump pump is present and the participant reports it is functioning well.

Assessed Maintenance	SB	<b>#53. Sump pump(s) maintenance</b> How often are sump pump(s) and alarms tested, repaired or replaced?	Each season, before vacation, and when an extreme rain or melt event is predicted, the participant tests the sump pump(s). They repair or replace these as required.
Assessed Feature	SB	<b>#54. Back-up power source</b> Is a back-up battery or generator is present and functioning properly? Is the backup power source elevated above anticipated flood levels?	A back-up battery or generator is present, can generate electricity for a minimum of 72 hours and is reported by participant to be functioning properly. A backup battery or generator is elevated above anticipated flood levels. Consider installing an alarm to further reduce risk.
Assessed Maintenance	SB	<b>#55. Back-up power source maintenance</b> How often do you test the backup power sources?	Each season, before vacation, and when an extreme rain or melt event is predicted, the participant tests the backup power sources and repairs or replaces the units as required. Consider installing and maintaining an alarm to further reduce risk.

#### F) Exposed Foundation Walls, Floors and Cold Rooms

Category	Water Damage Risk Type	Assessed Feature Name and Key Questions to Ask	Best Practice
Assessed Feature	GS	<b>#56. Unfinished wall cracks</b> Are your foundation walls free of cracks and stains?	The foundation walls are free of cracks and water stains.
Assessed Maintenance	GS	<b>#57. Unfinished wall crack maintenance</b> How often do you check for cracks, fill cracks and remove sources of water buildup at the foundation?	Once per season the participant checks for cracks, fills cracks and removes the sources of water buildup at the foundation as needed (corrects drainage, repairs eaves troughs and/or removes snow in winter, and seals foundation from outside in extreme cases). The participant consults with a professional in case of major problems.
Assessed Feature	GS	<b>#58. Unfinished wall efflorescence</b> Is there evidence of efflorescence on your walls, indicating water movement through the foundation?	The foundation walls are free of efflorescence.
Assessed Maintenance	GS	<b>#59. Unfinished wall efflorescence maintenance</b> How often do you check for evidence of efflorescence, address sources of water buildup at foundation, and clean and repaint with masonry waterproofing paint?	Once per season the participant checks for evidence of efflorescence, addresses the sources of water buildup at the foundation, cleans and repaints the surface with masonry waterproofing paint as required.
Assessed Feature	GS	<b>#60. Unfinished wall moisture</b> Are there high levels of moisture on the surface of your walls below windows, near cracks and where walls meet floor?	Low moisture levels are present on all tested areas of wall surface. Monitor for signs of dampness during heavy downpours and spring melts.
Assessed Feature	GS	<b>#61. Unfinished floor cracks</b> Are there cracks in your floor that provide potential water entry sites to your basement?	Unfinished floors are free of cracks and water stains.

Assessed Maintenance	GS	<b>#62. Unfinished floor crack maintenance</b> How often do you check for cracks, fill cracks, remove source of water buildup at foundation?	The participant checks for cracks once per season, fills cracks and removes source of water buildup at the foundation as needed (corrects drainage, repairs eaves troughs and/or removes snow in winter, seals foundation from outside in extreme cases). The participant consults with a qualified professional regarding major concerns.
Assessed Feature	GS	<b>#63. Unfinished floor efflorescence</b> Is there evidence of efflorescence on floors, indicating water movement through the foundation?	Floors are free of efflorescence.
Assessed Maintenance	GS	<b>#64. Unfinished floor efflorescence maintenance</b> How often do you check for evidence of efflorescence, address sources of water buildup at foundation, and clean and repaint with masonry waterproofing paint?	Once per season the participant checks for evidence of efflorescence, addresses sources of water buildup at foundation, cleans and repaints with masonry waterproofing paint as required.
Assessed Feature	GS	<b>#65. Unfinished floor moisture</b> Are there high levels of moisture, indicating water entry into the basement?	Low moisture levels are present on the floor surface. Monitor for signs of dampness during heavy downpours and spring melts.
Assessed Feature	GS	<b>#66. Earth floors</b> Are earth floors adequately sealed to reduce risk of flood, moisture buildup and mold growth?	Earth floors are covered with an adequate moisture barrier. At minimum a 6 mil poly moisture barrier covers over the earth with all seams sealed and edges sealed to the walls.
Assessed Maintenance	GS	<b>#67. Earth floor maintenance</b> How often do you inspect the 6 mil poly moisture barrier for punctures and seam failures and repair or replace materials as needed?	Each year the participant inspects the 6 mil poly moisture barrier for punctures and seam failures. They repair or replace materials as needed. The participant monitors for signs of dampness during heavy downpours and spring melts.
Assessed Feature	OW	<b>#68. Cold Rooms</b> Are cold rooms properly ventilated, with all surfaces maintaining consistent temperature to reduce mold and mildew risk?	The door, frame and seals are all in good condition and there is no evidence of water entry. Door is adequately insulated. Air circulation level is good with adequate venting and with items off of floor and away from walls by at least 15cm (6"). Space is unheated.

### G) Finished Walls and Floors

Category	Water Damage Risk Type	Assessed Feature Name and Key Questions to Ask	Best Practice
Assessed Feature	GS	<b>#69. Finished walls</b> Are water stains or high moisture levels indicating sources of water infiltration?	Walls are free of water stains, no evidence of mold (smell or visual evidence), audible moisture meter indicates no concern.
Assessed Maintenance	GS	<b>#70. Finished wall maintenance</b> How often do you check for high levels of moisture and water stains?	Each season the participant checks for high levels of moisture and water stains. If high levels of moisture or water damage and/or mold is evident, they consult a professional for remediation. The participant monitors for signs of dampness during heavy downpours and spring melts.
Assessed Feature	GS	<b>#71. Finished floors</b> Are there high levels of moisture, indicating water entry into the basement?	Low levels of moisture are present on floors, no evidence of mold or mildew are present and no musty smell is present.
Assessed Maintenance	GS	<b>#72. Finished floor maintenance</b> How often do you the check for water damage and signs of mold growth?	Each season the participant checks for water damage and signs of mold growth. If water damage and/or mold is evident, they consult a professional for remediation.

### H) Windows

Category	Water Damage Risk Type	Assessed Feature Name and Key Questions to Ask	Best Practice
Assessed Feature	OW	<b>#73. Basement windows</b> Are windows in adequate condition to reduce risk of overland flooding?	Glass, frames and seals are all in good condition. There is no evidence of water entry.
Assessed Maintenance	OW	<b>#74. Basement window maintenance</b> How often do you check for cracked glass, broken seals and rotting frames?	The participant checks once per season for cracked glass, broken seals and rotting frames, repairs AND/OR replaces these as required.

### I) Plumbing Fixtures

Category	Water Damage Risk Type	Assessed Feature Name and Key Questions to Ask	Best Practice
Assessed Maintenance	PF	<b>#75. Indoor plumbing and fixtures maintenance</b> How often do you inspect toilets, taps, pipes and water heaters, and have repaired by a plumber as needed?	Each season toilets, taps, pipes and water heaters are inspected by the participant and are repaired by a plumber as needed. Consider installing and maintaining flood alarms.

**J) Additional Considerations for Limiting Risk of Water Damage, Mold and Mildew Growth**

Category	Water Damage Risk Type	Assessed Feature Name and Key Questions to Ask	Best Practice
Assessed Feature	N/A	<b>#76. Furniture and electronics</b> Are furniture and electronics at risk of damage in the event of a flood?	Furniture items have non-absorbent surfaces up to 30cm (12") and electronics are stored at least 30cm (12") off the floor (or to exceed anticipated flood levels).
Assessed Feature	N/A	<b>#77. Stored valuables</b> Are your valuables at risk of damage during a flood or at risk of mold and mildew growth?	Valuables are stored in sealed, non-absorbent containers at least 30cm (12") off the floor (or to exceed anticipated flood levels), at least 15cm (6") away from walls that provide good air circulation OR no valuables are stored in the basement.
Assessed Feature	N/A	<b>#78. Relative humidity, air movement and temperature</b> Are the moisture, humidity and temperature levels in your basement optimum to reduce mold and mildew risk?	A 30-50% relative humidity reading is taken in the basement. Air circulation is good. Minimum regular temperature above 15C (60F) is maintained.
Assessed Feature	N/A	<b>#79. Indoor Sources of Moisture</b> Are indoor sources of moisture limited to reduce mold and mildew risk?	If a bathroom with a shower is present, a fan is present and when running it is strong enough to hold a piece of tissue. The fan is run for 30-60 minutes after bath or shower use. Furnace humidifiers do not operate in the summer. Wood is not stored, laundry is not hung, and boots are not dried etc. in the basement.

**K) Hazardous Materials**

Category	Water Damage Risk Type	Assessed Feature Name and Key Questions to Ask	Best Practice
Assessed Feature	N/A	<b>#80. Hazardous materials</b> Are hazardous materials stored in a way that represents a contamination risk during a flood?	No hazardous materials are stored in the basement OR materials are stored in waterproof containers at least 30cm (12") off the floor (or to exceed anticipated flood levels) and/or heating fuel tanks are secured to the floor.