TECHNICAL AND CORPORATE SERVICES

PUBLIC SAFETY DIVISION

ALBERTA MUNICIPAL AFFAIRS

SAFETY.SERVICES@GOV.AB.CA

PHONE 1.866.421.6929

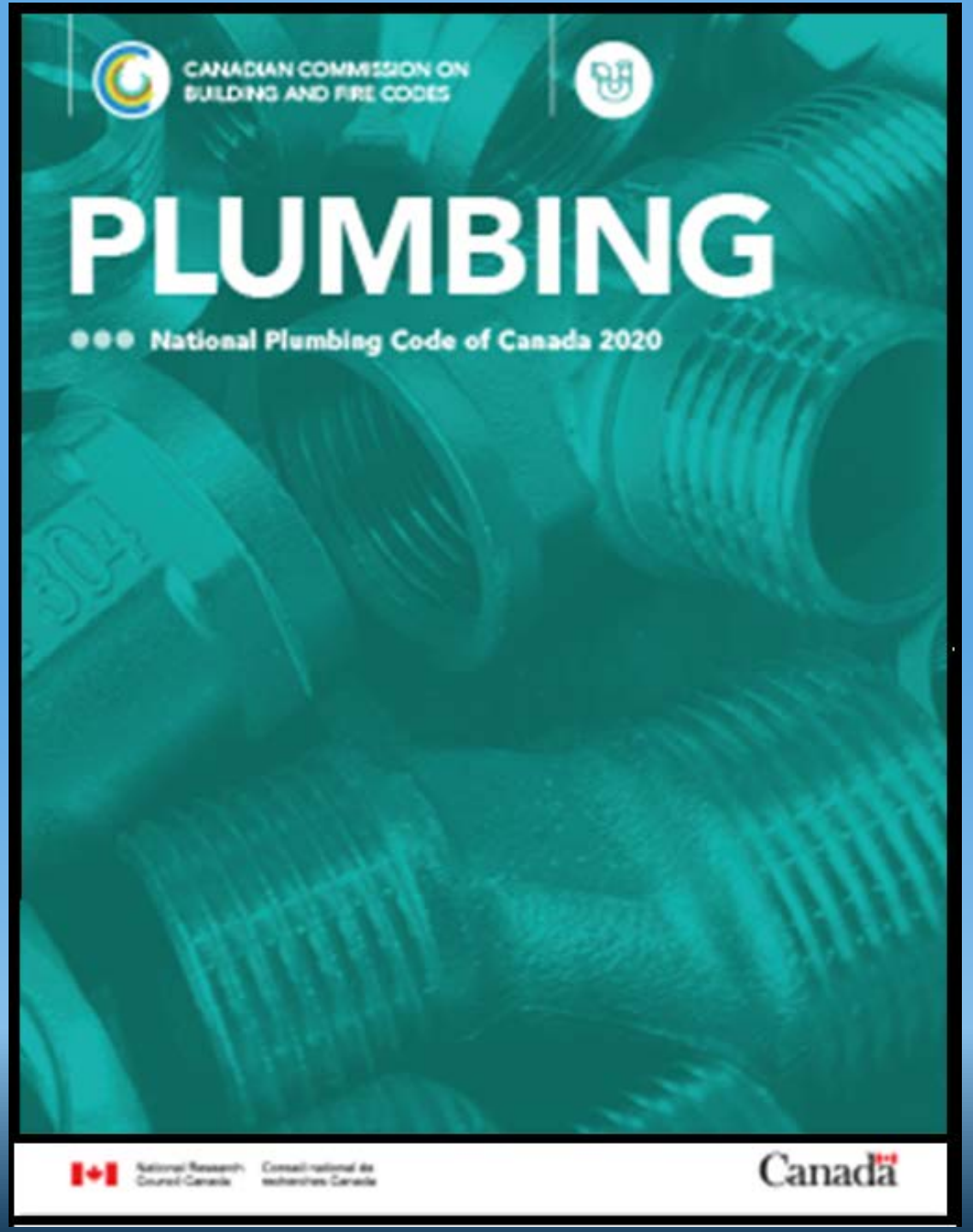
PLUMBING SYSTEMS

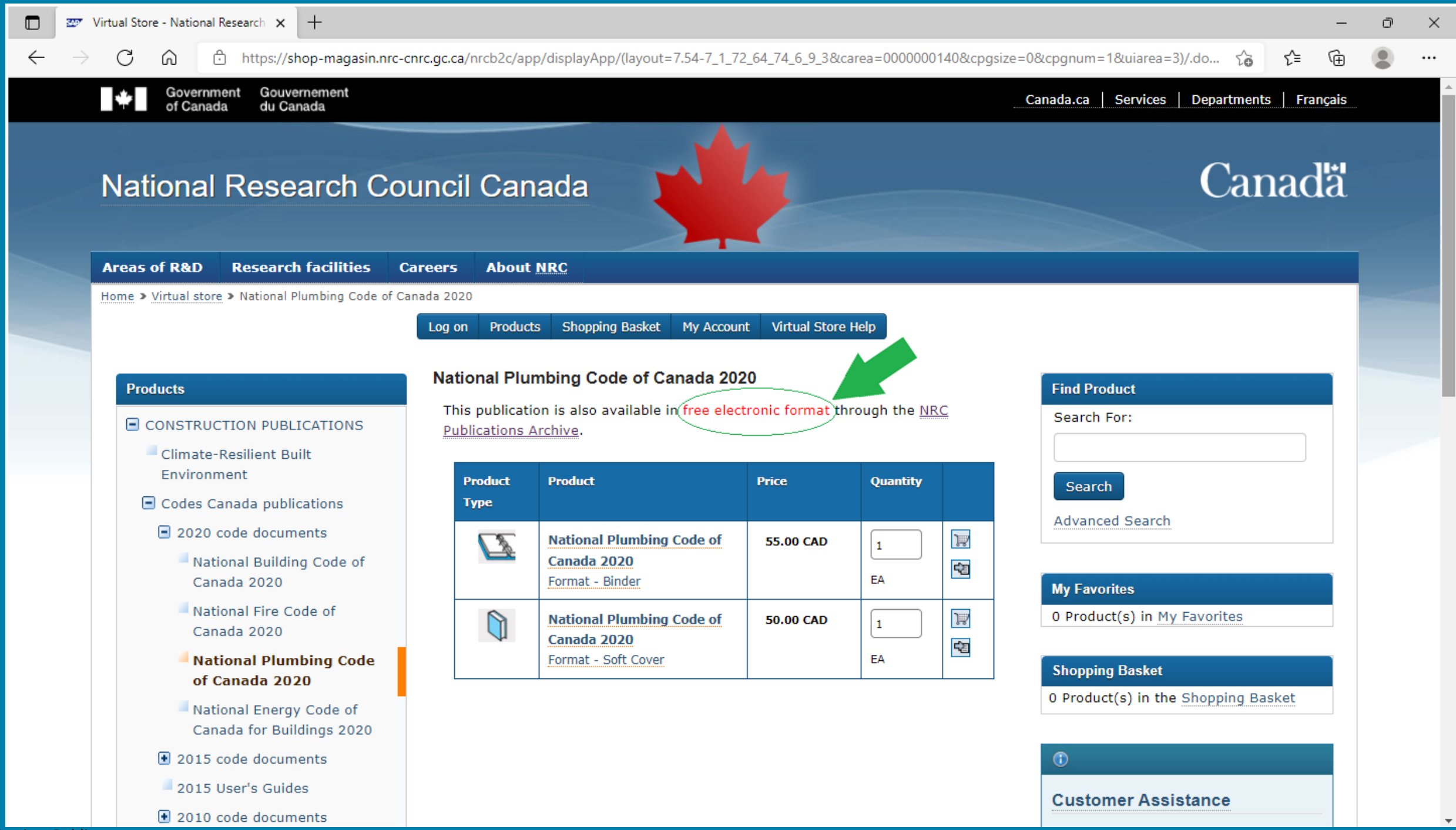
THE *NATIONAL PLUMBING CODE OF CANADA 2020*

PUBLISHED: MARCH 28, 2022

CAME INTO FORCE IN ALBERTA

APRIL 01, 2023


CANADIAN COMMISSION ON
BUILDING AND FIRE CODES
PLUMBING
National Plumbing Code of Canada 2020
Canada



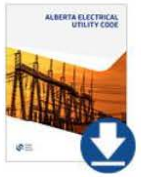
Safety Codes Council | Permits & Inspections | Training & Certification | Municipalities, Corporations & Agencies | Council Information | Council Connect

Safety Codes Council > Permits and Inspections > Understanding Codes and Standards > Code Books & Guides

Code Books & Guides

Code Books & Guides

The Safety Codes Council produces a number of handbooks and guides to help you interpret and apply the codes and standards recognized in the province of Alberta.



NEW – Alberta Electrical Utility Code, Sixth Edition 2022 – FREE DOWNLOAD

Comes into Force September 1, 2023

The Alberta Electrical Utility Code (AEUC) sets out minimum standards to be followed in regards to electrical work.

Fifth Edition 2016 of the AEUC will remain in-force until August 31, 2023 and will apply to permit applications received to August 31, 2023. After September 1, 2023, permit applications, subsequent system designs, and installations must reflect Sixth Edition 2022 of the AEUC.

(Print version also available for purchase through Alberta King's Printer.)

NEW – Alberta Private Sewage Systems – Standard of Practice, Fourth Edition 2021 – FREE DOWNLOAD

**updated December 2021*

In Force as of November 1, 2022

The Private Sewage Systems Disposal Regulation adopts the Alberta Private Sewage Systems Standard of Practice (SOP) as amended or replaced from time to time.

Version 2015 of the SOP will remain in-force until October 31, 2022 and will apply to permit applications received to October 31, 2022. After November 1, 2022, permit applications, subsequent system designs, and installations must reflect Version 2021 of the SOP. Upon completion of their SOP Update Training, Certified Installers may use and reference Version 2021 of the SOP on permit applications prior to the November 1, 2022 in-force date.

The Council will establish code update training requirements for Group B Plumbing SCOs in the coming months.

(Print version also available for purchase through Alberta King's Printer.)

Outline

1. Seismicity
2. Piping and transfer systems
3. Potable and non-potable water systems
4. New materials and equipment

- Posted for public review – Fall 2019

STANDATA variance 15-PCV-03

Plumbing

Cellular core PVC pipe and fittings

Date Issued: September 2021

Purpose

This variance allows Albertans to use cellular core polyvinyl chloride (PVC) pipe in residential buildings containing one or two dwelling units and row houses that do not exceed three storeys in height.

Discussion

This variance recognizes the National Plumbing Code of Canada 2020 will include cellular core PVC pipe and fittings that conform to ASTM F 3128-19, "Poly(Vinyl Chloride) (PVC) Schedule 40 Drain, Waste, and Vent (DWV) Pipe with a Cellular Core" for use with PVC and CPVC drain, waste, vent pipe and pipe fittings requirements.

Issue

Industry stakeholders want an option to use cellular core PVC pipe for DWV applications during significant plastic drainage supply shortages due to limited availability of base materials and in advance of proposed changes for the next version of the National Plumbing Code of Canada.

Application

This variance applies to the use of cellular core PVC pipe in residential buildings containing one or two dwelling units and row houses that do not exceed three storeys in height.

This VARIANCE is applicable throughout the Province of Alberta.

Unless stated otherwise, all Code references in this STANDATA are to the National Plumbing Code of Canada.

Issued by the Provincial Plumbing Administrator

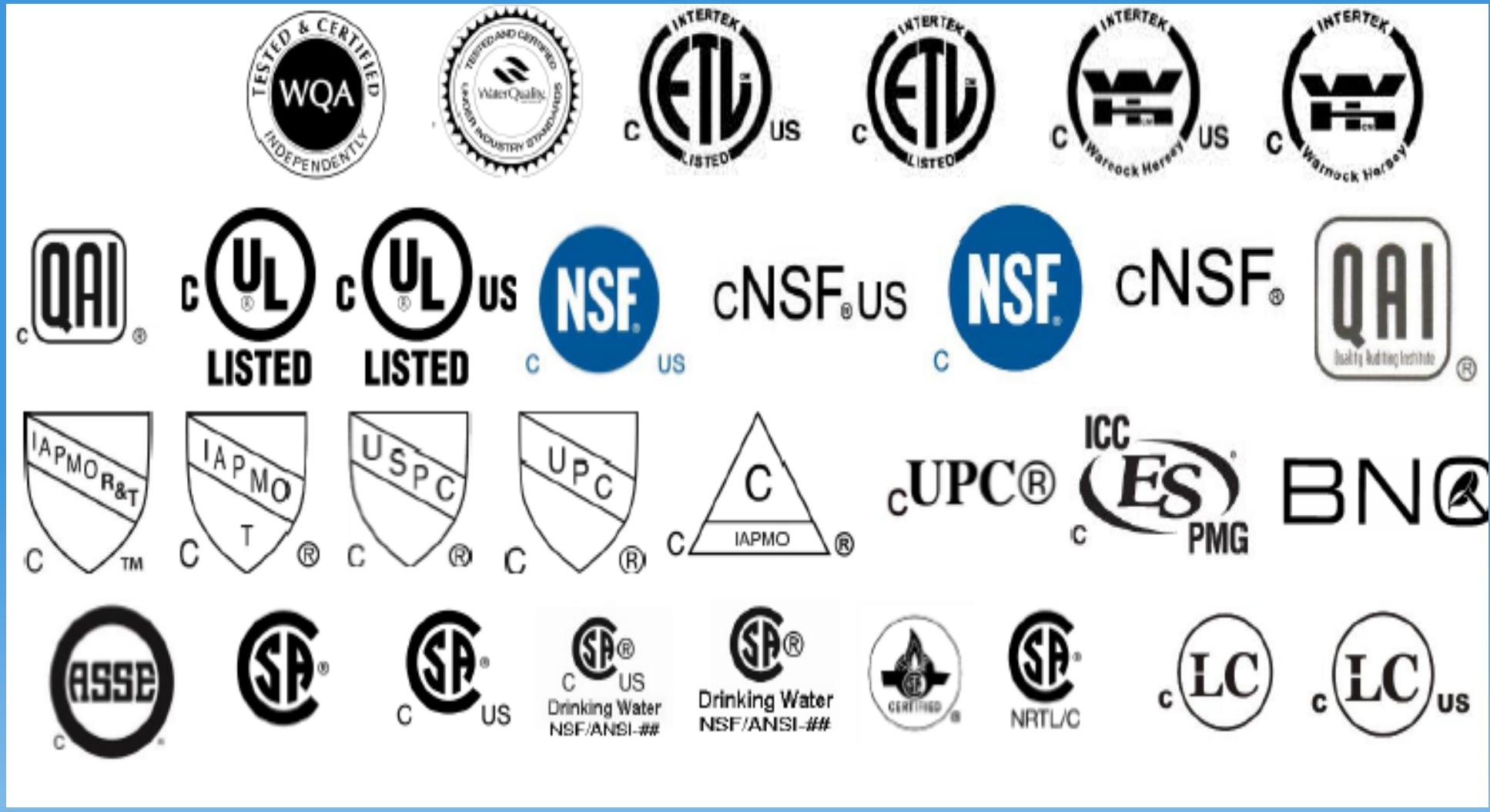
[Original Signed]
Sidney Manning

Alberta Municipal Affairs – Technical and Corporate Services
Phone: 1-866-421-6929 Email: safety.services@gov.ab.ca

To sign up for our List Subscription Service go to: municipalaffairs.gov.ab.ca/am_list_subscription_services

https://www.alberta.ca/plumbing-standata.aspx

Alberta


TESTED & CERTIFIED
WQA
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IAPMO R&T
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USPC
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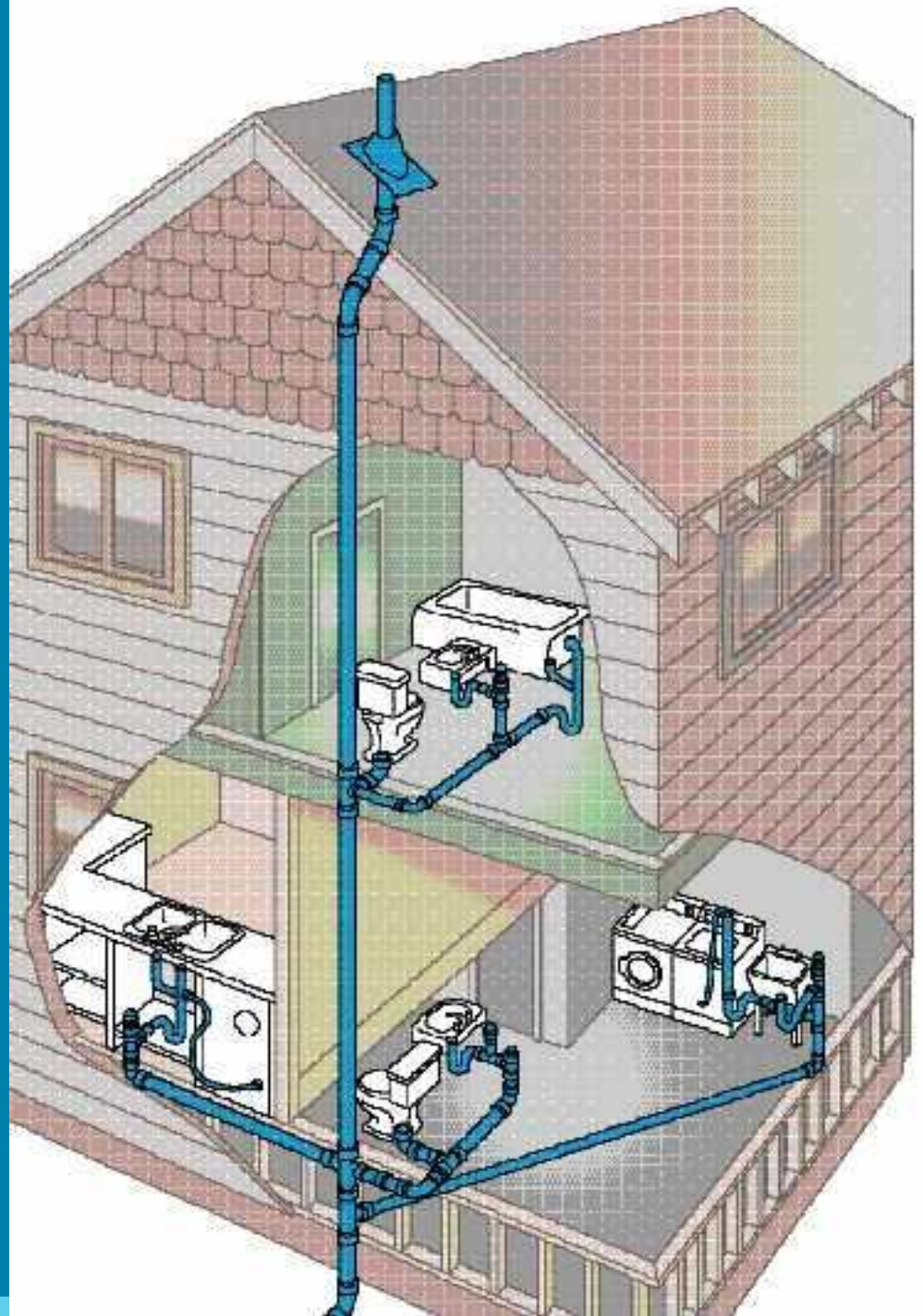
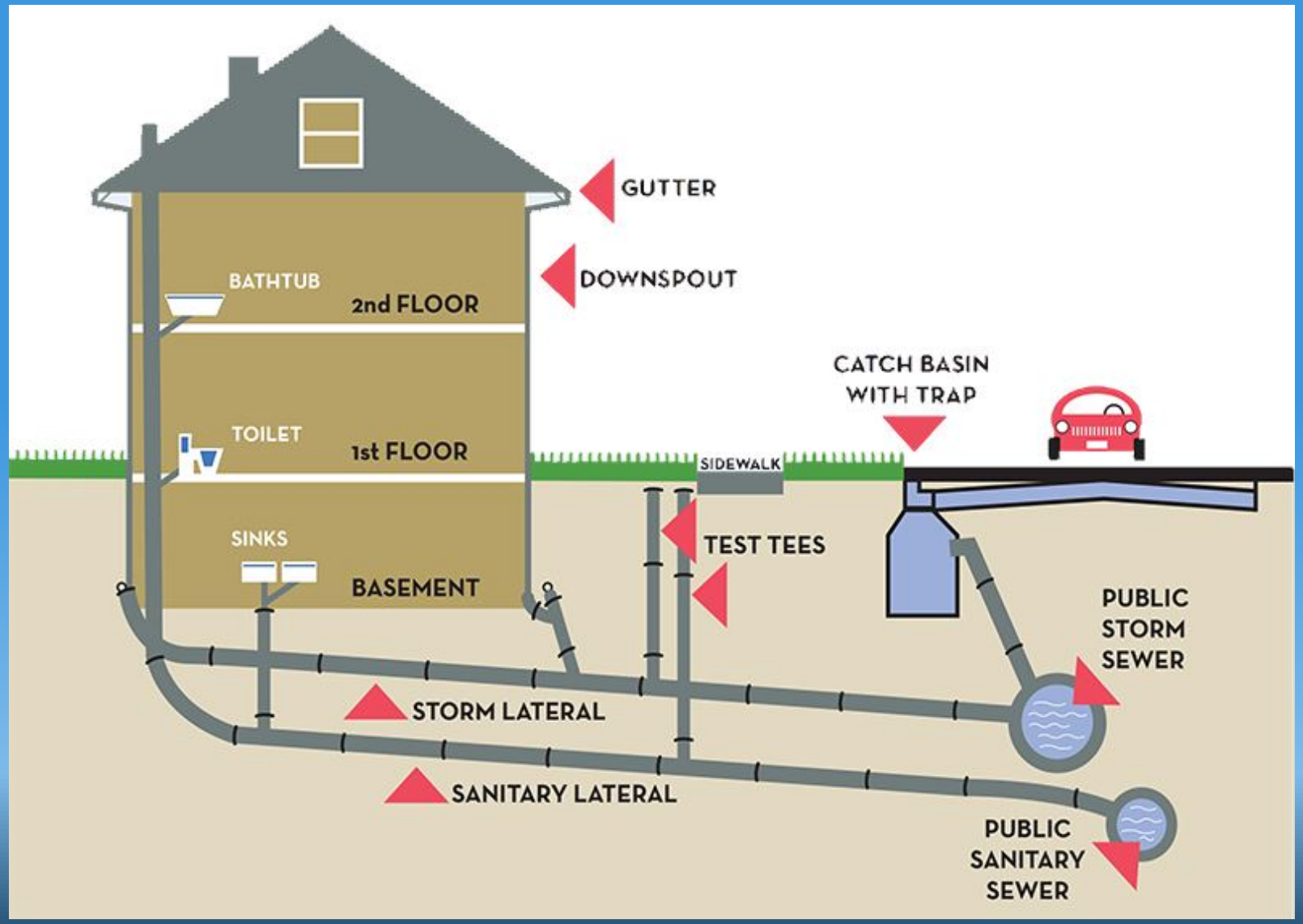
IAPMO
cUPC®
ICC
ES
PMG
BNQ
ASSE
CSA
US
Drinking Water
NSF/ANSI-##
NRTL/C
LC
US

Air Admittance Valves

There is ongoing discussion about air admittance valves being used to protect traps in new construction other than *fixtures* located in island counters.



STORM VS SANITARY IDENTIFICATION.



WATER AND SEWER SERVICES

Province of Alberta

SAFETY CODES ACT

PERMIT REGULATION

Plumbing Discipline

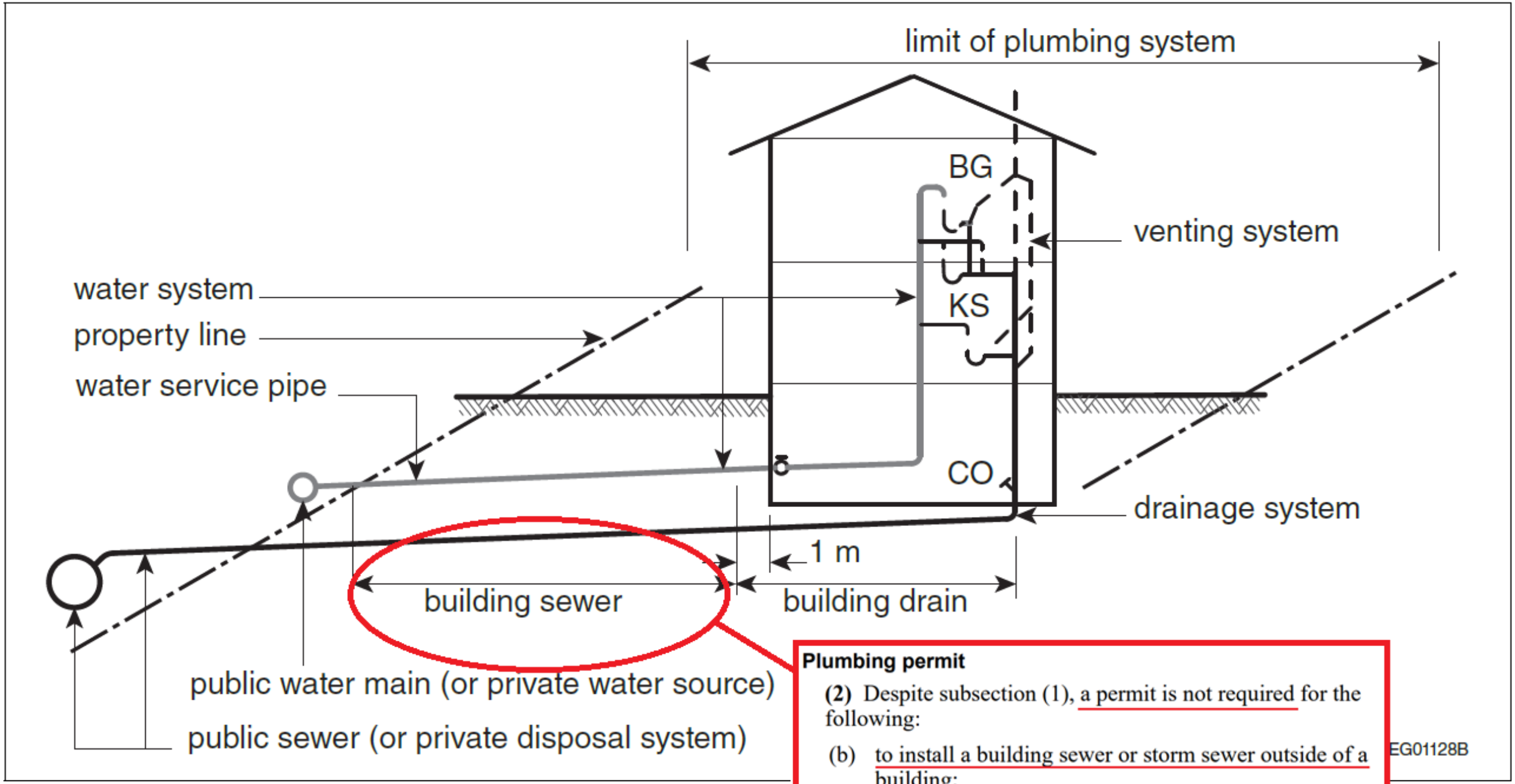
Plumbing permit

14(1) A permit in the plumbing discipline is required to install, alter or add to a plumbing system.

(2) Despite subsection (1), a permit is not required for the following:

(a) to install a water service that connects a building to a municipal or private water supply;

(b) to install a building sewer or storm sewer outside of a building;


limit of plumbing system
BG
venting system
water system
property line
water service pipe
KS
CO
drainage system
1 m
building sewer
building drain
public water main (or private water source)
public sewer (or private disposal system)
Plumbing permit
(2) Despite subsection (1), a permit is not required for the following:
(b) to install a building sewer or storm sewer outside of a building;
EG01128B

CRCP 2023

- BWV discussion.

- **PROTECTION FROM BACKFLOW - 2015 NPC**
- Requirements for Backflow protection were revised for NPC 2020, to remove reference to gate valves and screw caps because for these devices to work, human intervention is required. In case of an unoccupied occupancy this would not protect the space. The Article was also editorially rearranged. This rearrangement is causing interpretation issues. The purpose of this paper is to seek clarification from this committee.
- Backflow requirements in the NPC were introduced to reduce the possibility of backflow from a public sewer into the occupied space. This is expressed in the Intent statement below.

2015 NPC

2.4.6.4. Protection from Backflow

1) Except as permitted in Sentence (2), a *backwater valve* or a gate valve that would prevent the free circulation of air shall not be installed in a *building drain* or in a *building sewer*. (See Note A-2.4.6.4.(1).)

2) A *backwater valve* is permitted to be installed in a *building drain* provided that
- a) it is a "normally open" design conforming to
  - i) CSA B70, "Cast Iron Soil Pipe, Fittings, and Means of Joining,"
  - ii) CAN/CSA-B181.1, "Acrylonitrile-Butadiene-Styrene (ABS) Drain, Waste, and Vent Pipe and Pipe Fittings,"
  - iii) CAN/CSA-B181.2, "Polyvinylchloride (PVC) and Chlorinated Polyvinylchloride (CPVC) Drain, Waste, and Vent Pipe and Pipe Fittings," or
  - iv) CAN/CSA-B182.1, "Plastic Drain and Sewer Pipe and Pipe Fittings," and
- b) it does not serve more than one *dwelling unit*.

3) Except as provided in Sentences (4) to (6), where a *building drain* or a *branch* may be subject to *backflow*, a gate valve or a *backwater valve* shall be installed on every *fixture drain* connected to them when the *fixture* is located below the level of the adjoining street.

~~**4)** Where the *fixture* is a floor drain, a removable screw cap is permitted to be installed on the upstream side of the *trap*.~~

5) Where more than one *fixture* is located on a *storey* and all are connected to the same *branch*, the gate valve or *backwater valve* is permitted to be installed on the *branch*.

6) A *subsoil drainage pipe* that drains into a *sanitary drainage system* that is subject to surcharge shall be connected in such a manner that *sewage* cannot back up into the *subsoil drainage pipe*. (See Note A-2.4.6.4.(6).)

2020 NPC

2.4.6.4. Protection from Backflow

1) Except as provided in Sentences (2) and (3), where a *building drain* or a *branch* may be subject to *backflow*, a *backwater valve* shall be installed on every *fixture drain* connected to them when the *fixture* is located below the level of the adjoining street.

2) Where more than one *fixture* is located on a *storey* and all are connected to the same *branch*, the *backwater valve* is permitted to be installed on the *branch*.

3) A *subsoil drainage pipe* that drains into a *sanitary drainage system* that is subject to surcharge shall be connected in such a manner that *sewage* cannot back up into the *subsoil drainage pipe*. (See Note A-2.4.6.4.(3).)

4) Except as permitted in Sentence (5), a *backwater valve* or a gate valve that would prevent the free circulation of air shall not be installed in a *building drain* or in a *building sewer*.

5) A *backwater valve* is permitted to be installed in a *building drain*, provided that
- a) it is a "normally open" design conforming to
  - i) CSA B70, "Cast iron soil pipe, fittings, and means of joining,"
  - ii) CSA B181.1, "Acrylonitrile-butadiene-styrene (ABS) drain, waste, and vent pipe and pipe fittings,"
  - iii) CSA B181.2, "Polyvinylchloride (PVC) and chlorinated polyvinylchloride (CPVC) drain, waste, and vent pipe and pipe fittings," or
  - iv) CSA B182.1, "Plastic drain and sewer pipe and pipe fittings," and
- b) it does not serve more than one *dwelling unit*.

Intent of Sentence 2.4.6.4

To limit the probability that a backup of public sewers will lead to backflow into building drainage systems where fixtures are located below the level of the adjoining street, which could lead to unsanitary conditions which could lead to harm to persons.

The NPC 2015 permits 5 options, each of these options meets the requirements of the code in limiting the probability of a public sewer backing up into a buildings drainage system where fixtures are located below the level of the adjoining street

NPC 2015

A-2.4.6.4.(6) Protection from Backflow Caused by Surcharge. These requirements are intended to apply when in the opinion of the authority having jurisdiction there is danger of backup from a public sewer.

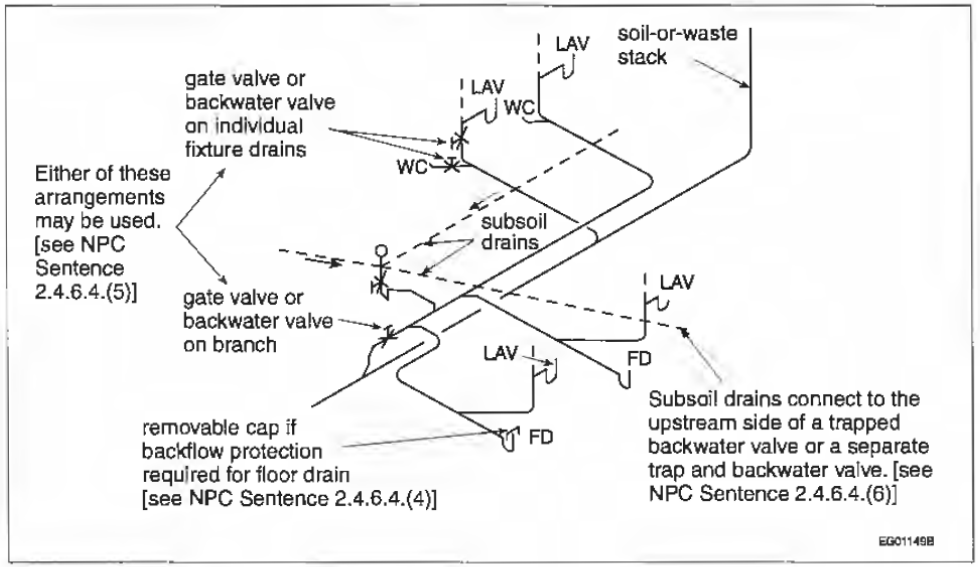


Figure A-2.4.6.4.(6)
Protection from Backflow Caused by Surcharge

NPC 2020

A-2.4.6.4.(3) Protection from Backflow Caused by Surcharge. The requirement in Sentence 2.4.6.4.(3) is intended to apply when, in the opinion of the authority having jurisdiction, there is danger of backup from a public sewer.

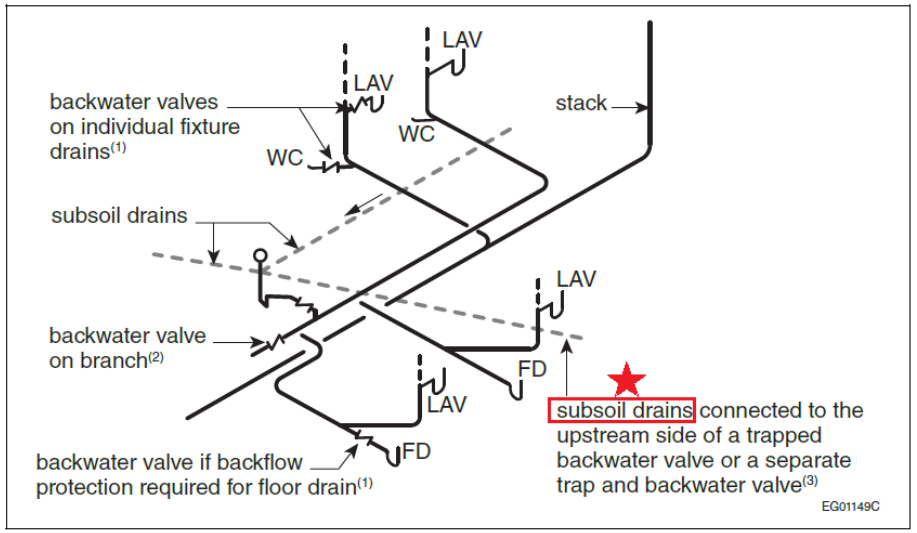
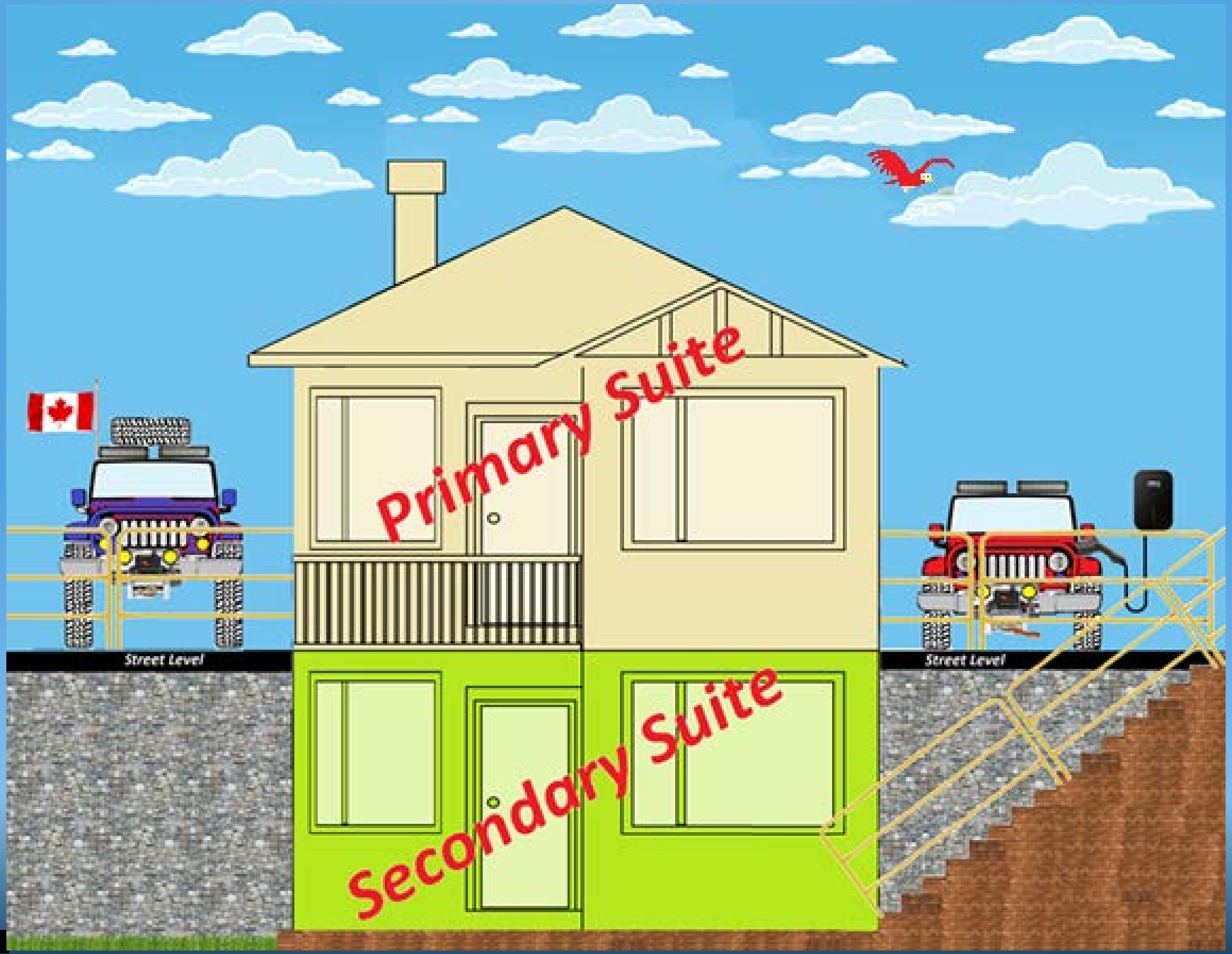
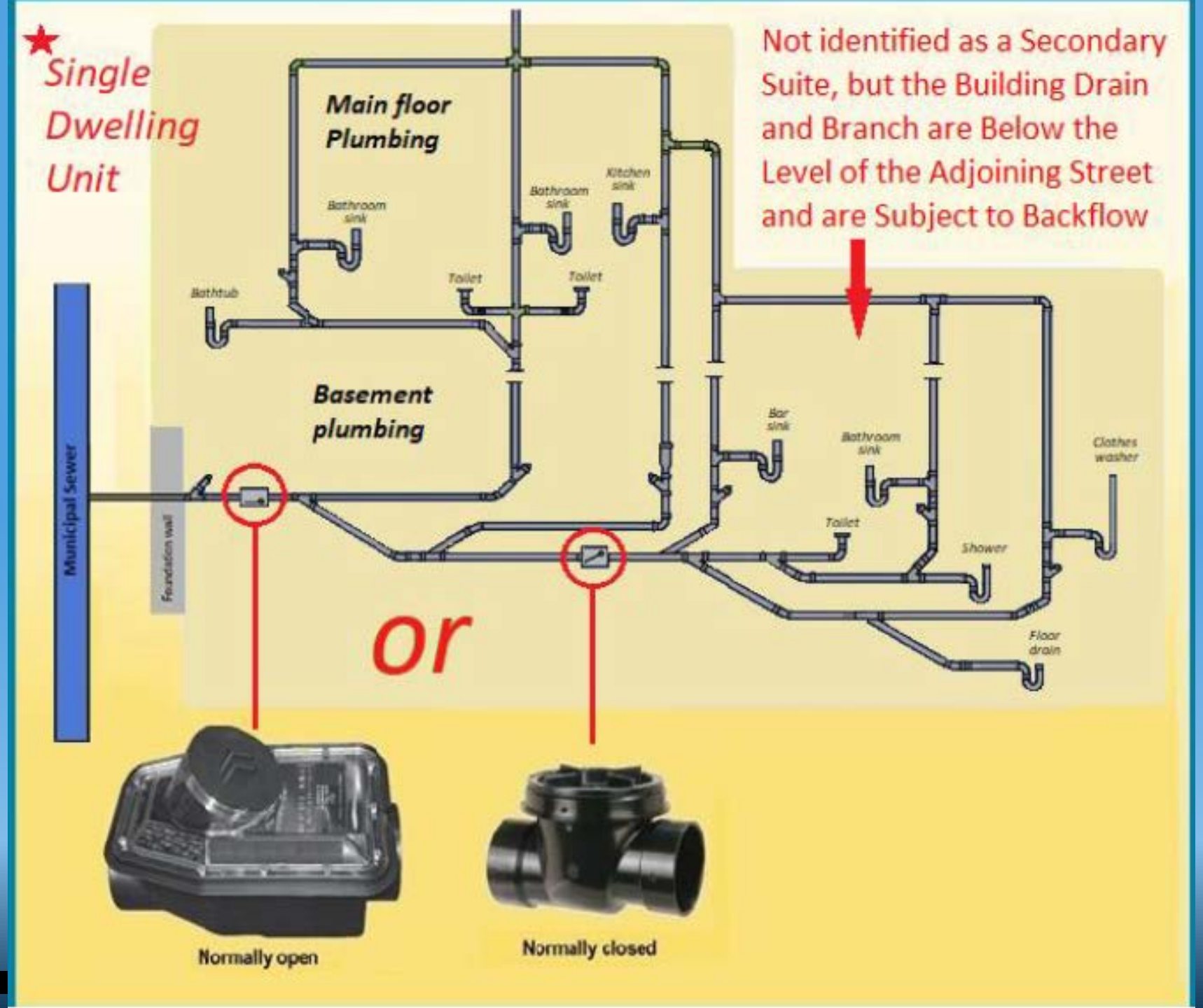
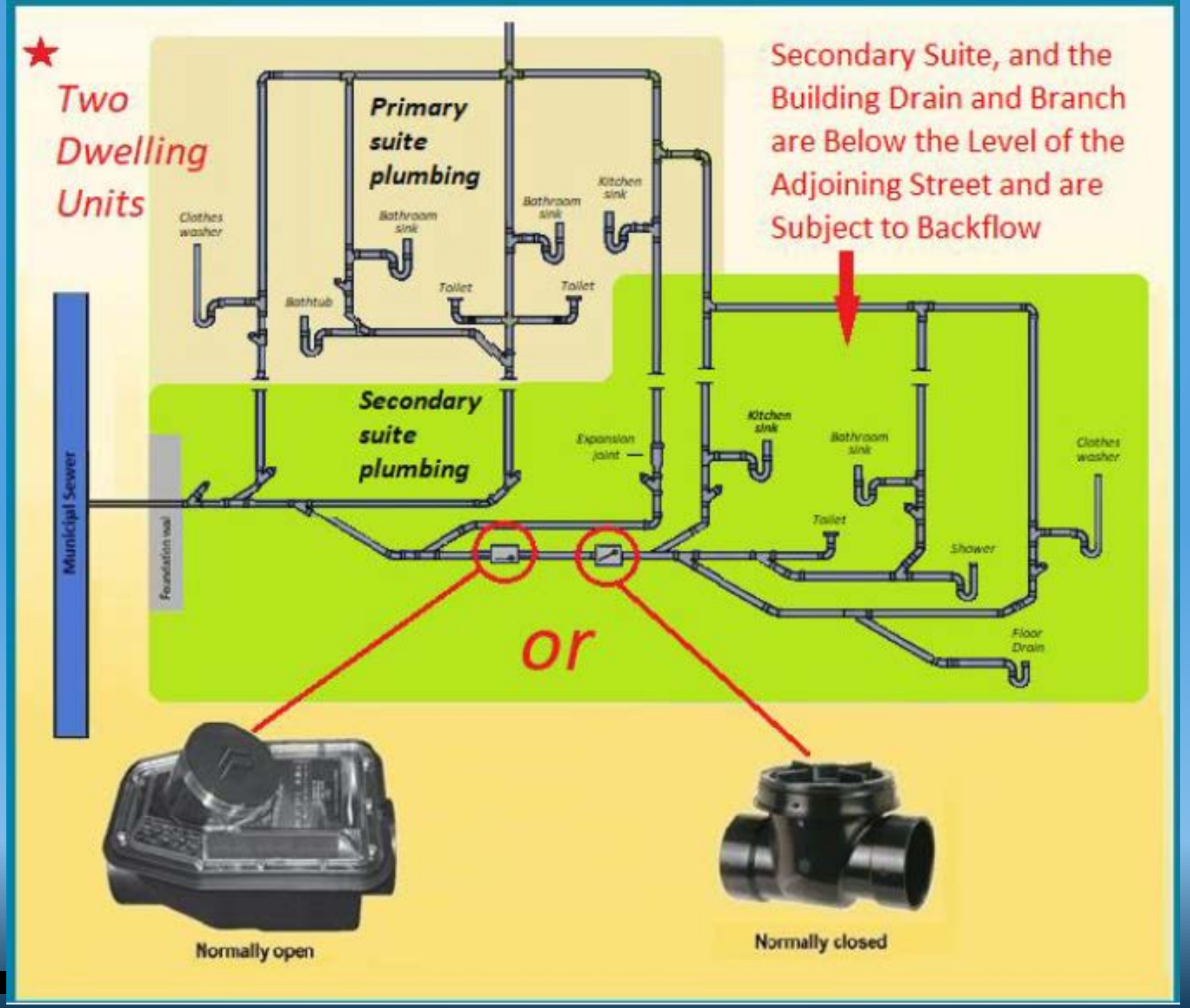
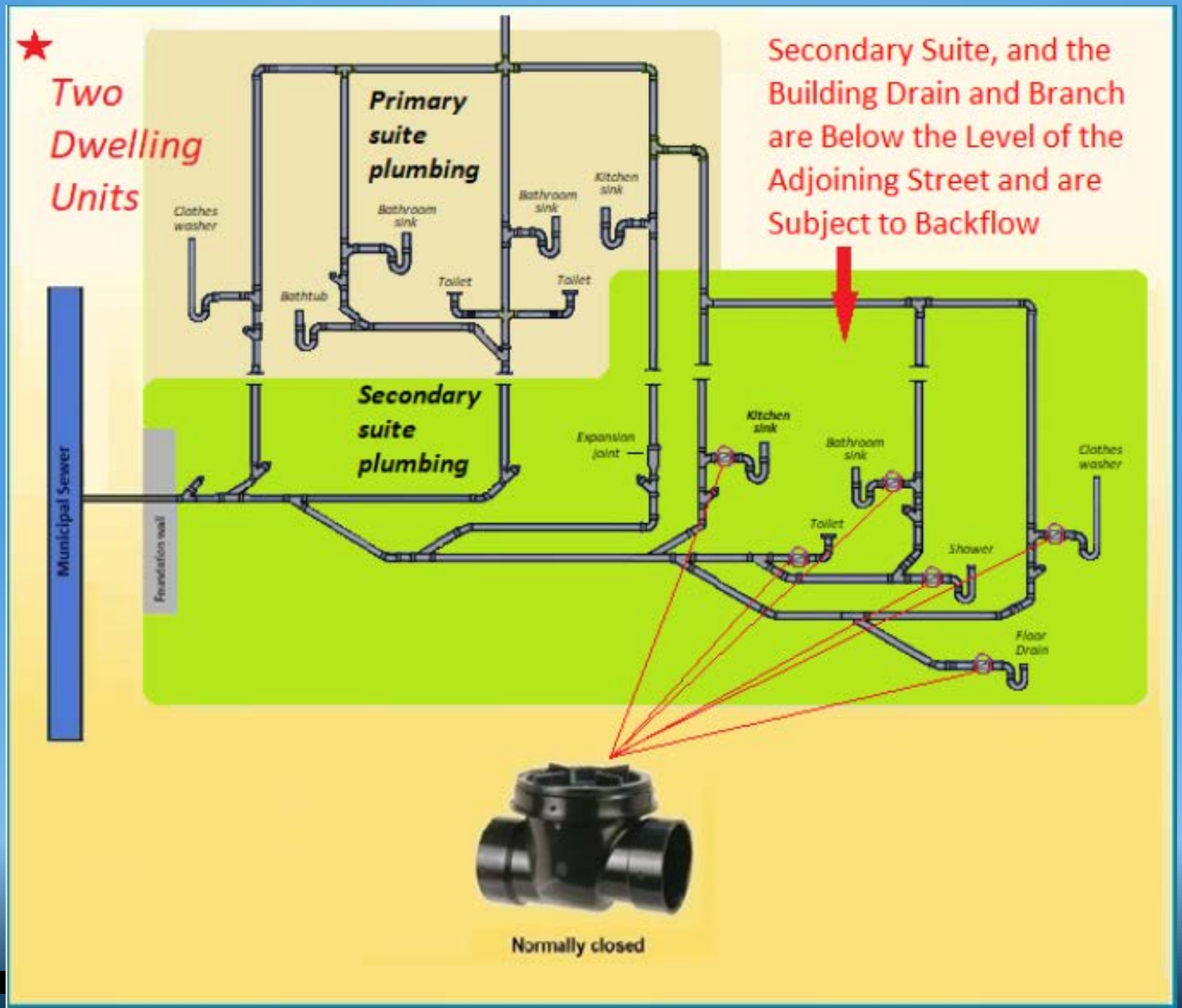


Figure A-2.4.6.4.(3)
Protection from backflow caused by surcharge

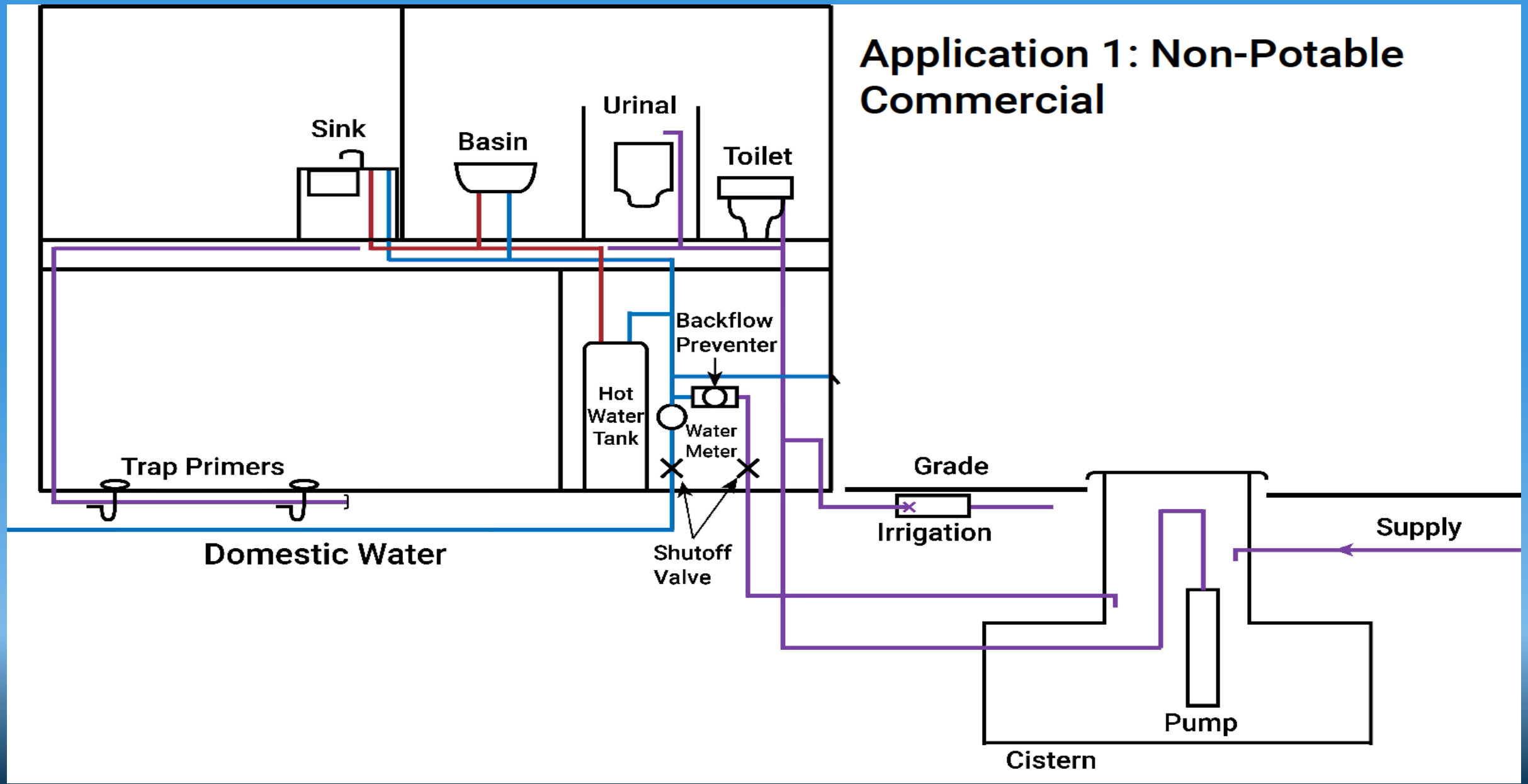




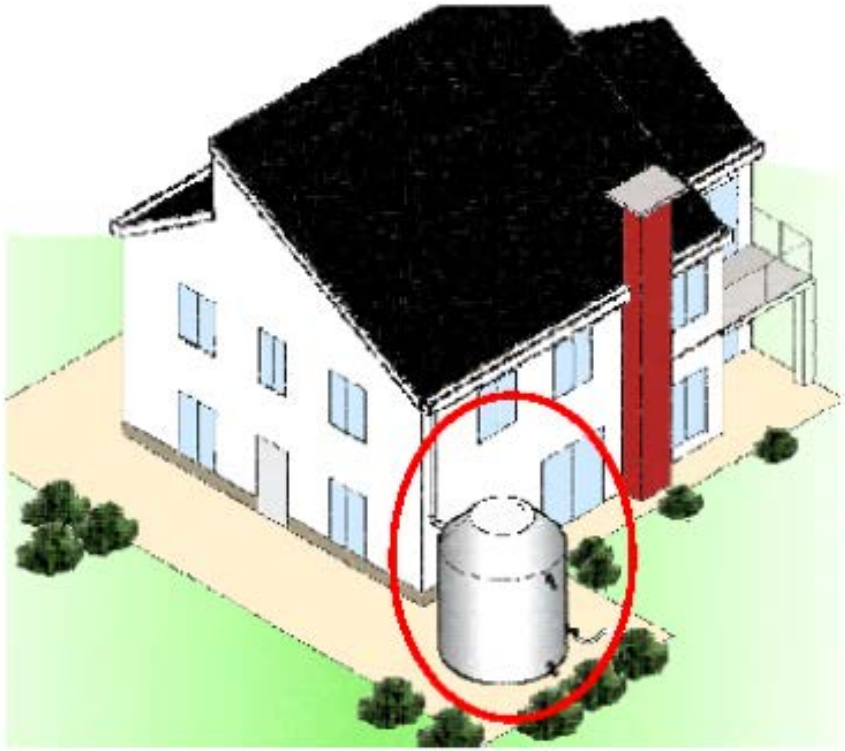




WATER REUSE


Application 1: Non-Potable Commercial
Sink
Basin
Urinal
Toilet
Backflow Preventer
Hot Water Tank
Water Meter
Trap Primers
Domestic Water
Shutoff Valve
Grade
Irrigation
Supply
Pump
Cistern

Rainwater harvesting



- ✓Safely be connected
- ✓Good engineering practice
- ✓Properly labeled
- ✓Safe location

2.7.2. Non-Potable Rainwater Harvesting Systems

2.7.2.2. Permitted Applications

1) Non-*potable* rainwater harvesting systems are only permitted to supply

a) water closets and urinals,
b) clothes washers,
c) floor-mounted service sinks and laundry trays,
d) *trap* primers,
e) irrigation systems,
f) hydronic systems,
g) make-up water systems for heat rejection systems, or
h) any other application where the harvested rainwater is not expected to be ingested or inhaled.

(See Note A-2.7.2.2.(1) and 2.7.2.4.(3) and (4).)

2.7.2.4. Non-Potable Rainwater Harvesting System Design

3) Non-*potable* rainwater harvesting systems shall be provided with a means to treat the harvested rainwater in such a manner that the quality of the delivered non-*potable* water conforms to appropriate provincial or territorial requirements or, in the absence of such requirements, the systems shall conform to Sentence (4). (See Note A-2.7.2.2.(1) and 2.7.2.4.(3) and (4).)

WATER REUSE REQUIRES WATER QUALITY IDENTIFIED, REPORTED TO AND MONITORED FOR COMPLIANCE BY AN AUTHORITY

NPC 2020 NOTES

- **Potable Water System Design.** There is a growing interest in Canada in using available non-potable water supplies in the place of potable ones for selected purposes such as flushing water closets and irrigating lawns and gardens. Article 2.7.1.1. applies to non-potable water systems, regardless of the origin of the water. The non-potable water must meet applicable water quality standards as determined by an authority having jurisdiction.

SCOs cannot "relax" Code requirements

A site specific Variance needs to be issued in writing

EXPIRED STANDATA

- PLUMBING SAFETY VARIANCE: Reclaimed Water Systems Within a Single Property, Under 25 m3 Capacity Per Day ***Expired*** http://www.municipalaffairs.alberta.ca/documents/VAR-P-15-01-Aug2015.pdf
- Reclaimed Water Systems Within a Single Property, Under $25m^3$ Capacity Per Day ***Expired*** - *Reissued as* 20-PCB-017-01[REV1] Reclaimed water systems within a single property (alberta.ca)

Public Health Guidelines for Water Reuse and Stormwater Use

Alberta Health Services

Alberta

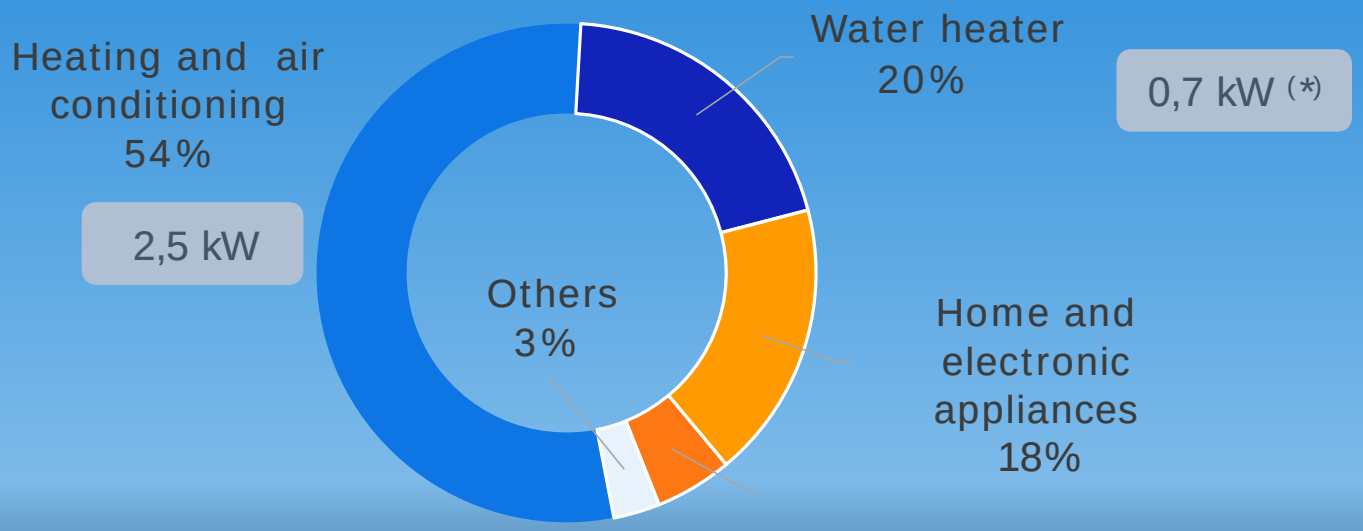
Water heater and Legionella

SUMMARY

- Potential energy saving
- Status on finished works
  - Project timeline
  - Public health requirements
  - Conclusion of finished works
- Water heater and Legionella
  - Health risks
  - Elsewhere in the world
  - Solutions available in Quebec
  - Market trends
- Conclusion

CONTEXT

- Water heating is the 2nd largest electricity consumption in a residence.
- Potential power gain during daily peak periods: 0.7 kW / house (diversified value).



Water heater = significant storage of usable energy throughout the year

KEY FACTORS FOR SUSTAINABLE EWH LOAD SHEDDING PROGRAM

The risk of legionella proliferation must not be increased by a EWHs load shedding program

To have a EWHs that complies with and validates the selected availability criterion before load shedding

To raise awareness and warn users before load shedding (to avoid shortages in hot water)

Availability criterion of the EWHs:
The temperature in the coldest zone (bottom of the tank) of the water heater must be maintained at 55 degrees Celsius or above at least 4 hours out 24 hours

TESTED SOLUTION FOR WATER HEATERS

Controller for water heater

Plumbing kit (thermosiphon)

Sensor

WATER HEATER AND LEGIONELLA

Favorable conditions for the development of bacteria:

- Stagnant water;
- Temperature: between 25° C and 45° C, with an optimum around 35° C; and
- Deposits of limescale, sludge, or metallic résidues.

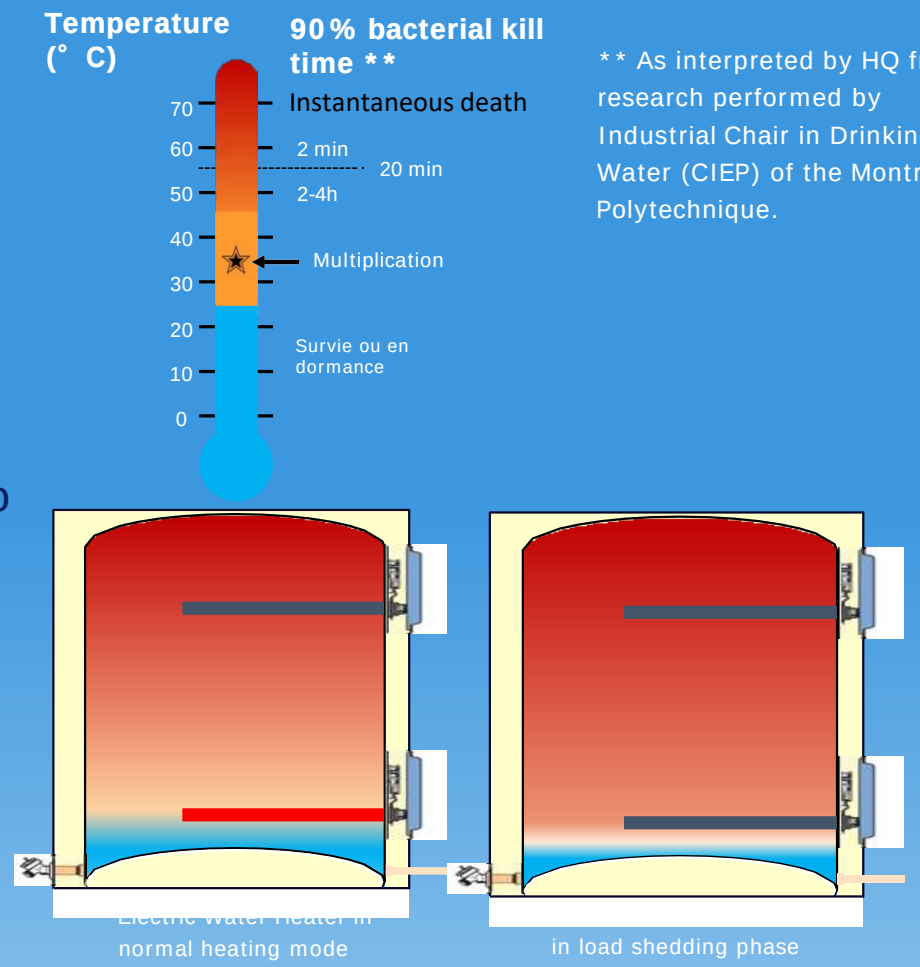
Conditions that allow Legionella bacteria develop in EWHs:

1. The lower heating element heats incoming water which rises to the top part of the tank.

2. The volume of water beneath the lower heating element of the hot water tank usually remains warm.

3. Over time, the bottom of the hot water tank becomes a favorable environment for bacterial growth.

4. The mechanical thermostats of hot water tanks do not guarantee reaching the set temperature of 60° C.



** As interpreted by HQ from research performed by Industrial Chair in Drinking Water (CIEP) of the Montreal Polytechnique.

HEALTH RISKS RECENT YEARS SITUATIONS

- Approximately 30 % of EWHs in Quebec are contaminated with Legionella
- Estimated annual number of cases in Quebec:

  560 cases (7/100 000 per year)
- **Annual number of cases due to electric water heaters (approximately 14 %):**

  80 cases(1/100 000 per year)

Source : Présentation HQ «Programme de débranchement des chauffe-eau électriques – Impact sur la santé publique », January 2015

AVAILABLE SOLUTIONS ON THE LOCAL MARKET

Contrôleurs sans validation du critère de disponibilité

Load controler 50A

Retail price:
140 $

Nouveau

Votre allié pour contrôler le chauffe-eau, les pompes de piscine et la recharge de votre véhicule électrique

Calypso water heater controller new model 2022)

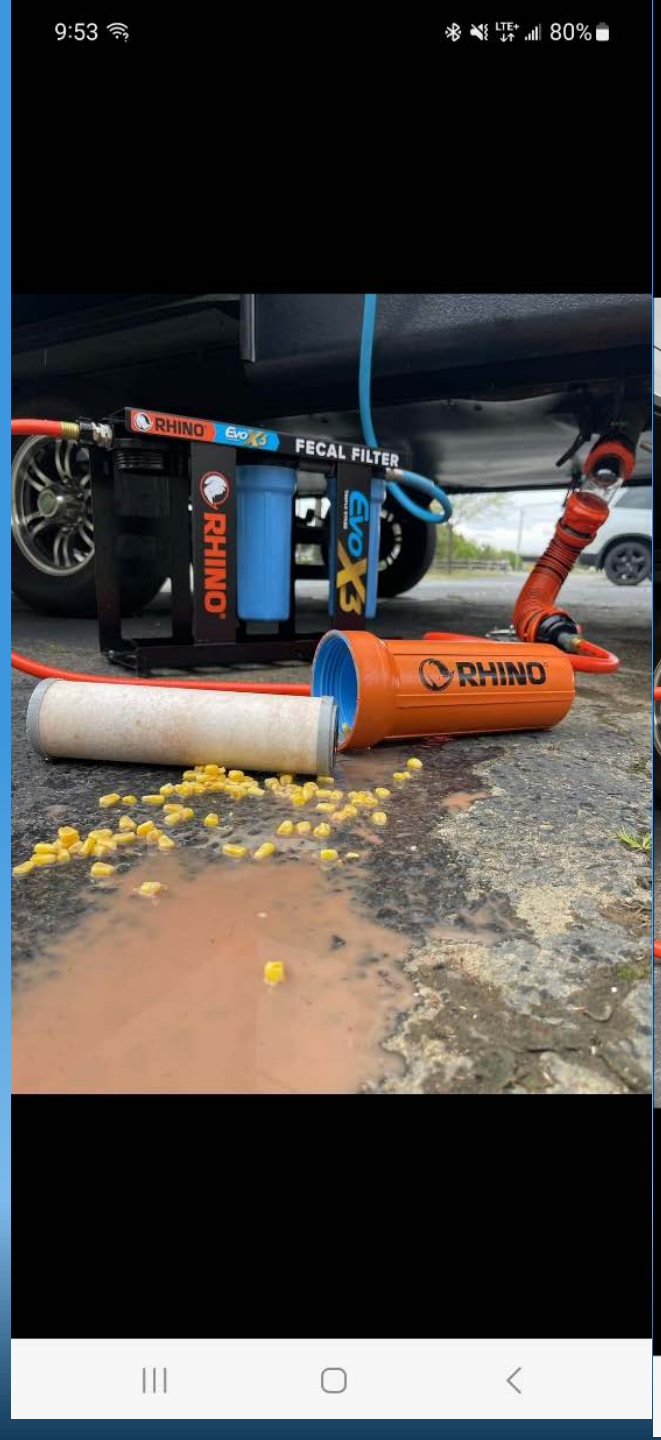
Retail price:
105 $

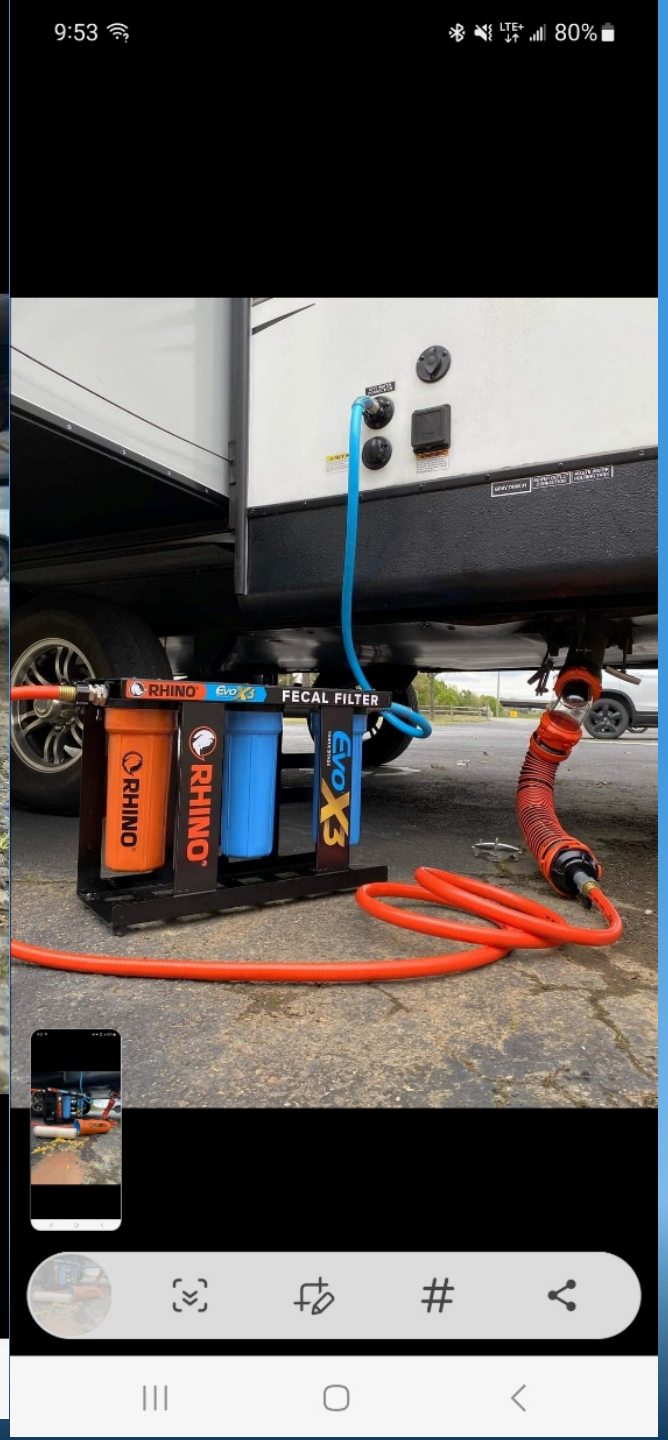
Sources : Contrôleur de charge électrique intelligent 50 A – Zigbee Page 1 sur 0 | Sinopé (sinopetech.com)
Contrôleur de chauffe-eau intelligent Zigbee RM3500ZB Sinopé (sinopetech.com)
Caractéristiques | Contrôleur de chauffe-eau Zigbee (sinopetech.com)
+ manuel d'installation et Fiche produit

CONTAMINATION OF DRINKING WATER SYSTEMS AFTER WILDFIRES

- https://arstechnica.com/science/2020/12/plastic-pipes-are-polluting-drinking-water-systems-after-wildfires/
- One sample found benzene, a carcinogen, at 40 times the state's drinking water standard.
- They also show the risks when only part of a building catches fire and the rest remains in use. In some of our tests, heat exposure caused more than 100 chemicals to leach from the damaged plastics.
- U.S. Environmental Protection Agency estimated that some plastic pipes would have required more than 100 days of nonstop water rinsing to be safe for use. Instead, officials decided to replace the pipes.

SIMPLIFYING CAMPING…





HYDRANT WATER SUPPLIES

Section 1.1. General

1.1.1. Application of this Code

1.1.1.1. Application of this Code

1) This Code applies to the design, installation, extension, alteration, renewal or repair of *plumbing systems*.

1.4.1.2. Defined Terms

*Plumbing system** means a *drainage system*, a *venting system* and a *water system* or parts thereof. (See Figure A-1.4.1.2.(1)-L in Note A-1.4.1.2.(1).)

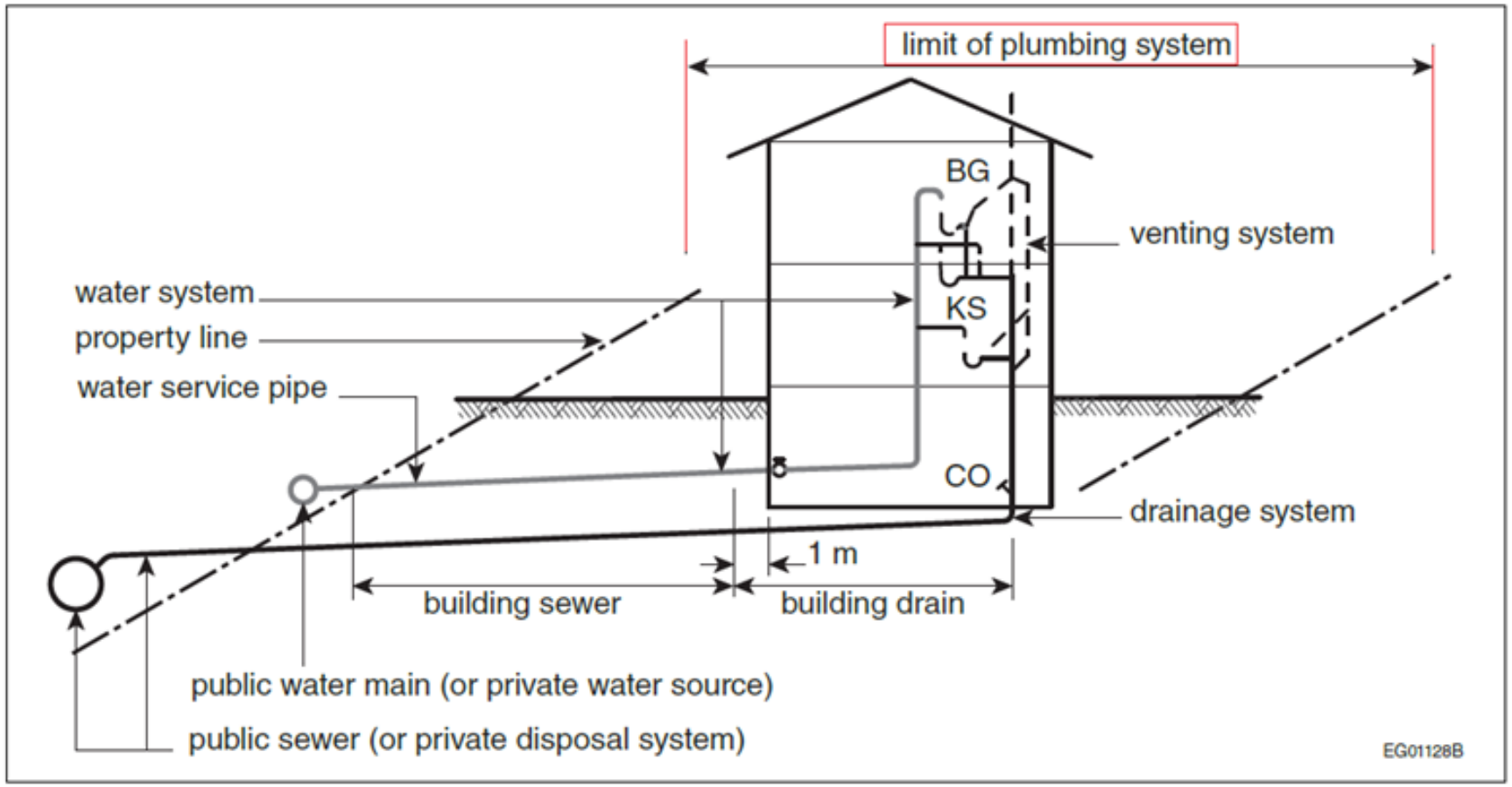


Figure A-1.4.1.2.(1)-L
Plumbing system

Hydronics

STANDATA bulletin 15-PCB-003/20-GCB-016[REV4]

- **Potable water approved components**
  - Design pressure and temperature
- Maintenance of domestic hot water supply
  - Identification of maximum velocity

GP COMPLIANCE ATTEMPT

DRYWALL SCREW VS SCHEDULE 40 BLACK IRON.

WHAT ABOUT PLUMBING PIPES?

2.3.5.4. Protection from Mechanical Damage

1) Plumbing, piping and equipment exposed to mechanical damage shall be protected.

Considering the information provided in Section 2.8 **Objectives and Functional Statements** of the NPC, depending on the location of piping, and the probability that the piping could be damaged by a screw, in some cases, could the AHJ consider screws penetrating the piping to be mechanical damage and require appropriate protection? The requirement is open to interpretation; however, plumbing must be protected to the satisfaction of the AHJ.

Questions?