BY-LAW NO. 12717

A By-law to amend Building By-law No. 12511
Regarding Plumbing Safety Amendments

THE COUNCIL OF THE CITY OF VANCOUVER, in public meeting, enacts as follows:

1. This By-law amends the indicated provisions of Building By-law No. 12511.

2. In Book II, Division A, Council adds a new definition to Sentence 1.4.1.2.(1), in correct alphabetical order, as follows:

> "*Decorative water feature* means a human-made fountain, waterfall, cascade, spray or the like that uses water for architectural, decorative or aesthetic effects, is not intended for human contact, and is located indoors or outdoors, and does not include a fish pond, natural body of water, natural waterfall, or a regulated activity under the BC Pool Regulation. (See Note A-1.4.1.2.(1).)".

3. In Book II, Division A, Council adds the following new abbreviations to Sentence 1.4.2.1.(1), in correct alphabetical order:

(a) "CFU …….. colony forming units";
(b) "LPM ……. litres per minute";
(c) "MPN ……. most probable number"; and
(d) "NTU ……. nephelometric turbidity units".

4. In Book II, Division A, Council adds a new note under "A-1.4.1.2.(1) Defined Terms." in the Notes to Part 1, in the correct alphabetical order, as follows:

> "Decorative Water Feature.
>
> A living or green wall is not considered a *decorative water feature*, but should be reviewed to identify hazards and to establish procedures to reduce risks. To preclude the growth of *Legionella*, consideration should be given to including non-chemical water treatment (such as UV), maintaining water temperature below 20 °C, and removing organic matter from the water. Water flow should be behind the plant material and airflow should be directed toward the living wall to minimize aerosolization into the occupied space.".

5. In Book II, Division B, Council strikes out in Table 1.3.1.2 the rows for "CSA CAN/CSA-B127.1-99" and "CSA B127.2-M1977".

6. In Book II, Division B, Council strikes out in Table 1.3.1.2 the By-law Reference "2.2.10.10.(2)" in the row for "CSA B125.3-12".

7. In Book II, Division B, Council strikes out in Table 1.3.1.2 the By-law Reference "2.7.6.2.(1)" in the row for "IAPMO Water Demand Calculator" and substitutes "2.7.6.2.(2)".

8. In Book II, Division B, Council adds in Table 1.3.1.2 new By-law References to the row for "CSA CAN/CSA-B181.2-11", in correct numerical order, as follows:

“2.2.5.15.(1)
2.2.5.15.(2)”.

9. In Book II, Division B, Council adds new rows to Table 1.3.1.2. in correct alphabetical order, as follows:

(a)

“

ANSI/ ASHRAE	188-2018	Legionellosis: Risk Management for Building Water Systems	2.2.10.6.(7)

”;

(b)

“

ASME/CSA	ASME A112.18.6-2017/CSA B125.6-17	Flexible Water Connectors	2.2.10.18.(1)

”;

(c)

“

ASSE	ASSE 1002-2015/ASME A112.1002-2015/CSA B125.12-15	Anti-Siphon Fill Valves for Water Closet Tanks	2.2.10.10.(2)

”;

(d)

“

ASSE	ASSE 1037-2015/ASME A112.1037-2015/CSA B125.37-15	Performance Requirements for Pressurized Flushing Devices for Plumbing Fixtures	2.2.10.8.(1)

”;

(e)

“

ASTM	F 3128-19	Poly(Vinyl Chloride) (PVC) Schedule 40 Drain, Waste, and Vent Pipe with a Cellular Core	2.2.5.15.(1)

”;

(f)

“

BC	B.C. Reg. 296/2010	Pool Regulation	1.4.1.2.(1)

”;

(g)

“

CSA	CAN/CSA-B127.3-18	Fibrocement Drain, Waste, and Vent Pipe and Pipe Fittings	2.2.5.1.(1) A-2.2.5., 2.2.6. and 2.2.7.

”;

(h)

“

ISO	11731:2017	Water Quality — Enumeration of *Legionella*	2.2.1.7.(2)

”;

(i)

“

ISO/IEC	17025:2017	General Requirements for the Competence of Testing and Calibration Laboratories	2.2.1.7.(2)

”;

(j)

“

NSF/ANSI	55-2019	Ultraviolet Microbiological Water Treatment Systems	2.2.11.3.(3)

”; and

(k)

“

PSPC	MD 15161-2013	Control of Legionella in Mechanical Systems	A-2.2.11.6.(7)

”.”

10. In Book II, Division B, Council adds the following new abbreviations to Sentence 1.3.2.1.(1), in correct alphabetical order:

(a) “BC ……. Province of British Columbia (gov.bc.ca)”;
(b) “IEC ……. International Electrotechnical Commission (www.iec.ch)”;
(c) “ISO ……. International Organization for Standardization (www.iso.org)”; and
(d) “PSPC ….. Public Services and Procurement Canada (www.tpsgc-pwgsc.gc.ca)”.

11. In Book II, Division B, Council adds a new Article 2.2.1.7. as follows:

"2.2.1.7. Microbiological Testing

1) *E. coli* testing shall be conducted by an *accredited laboratory*.

2) *Legionella pneumophila* testing shall be conducted by a laboratory

a) accredited to ISO/IEC 17025, "General requirements for the competence of testing and calibration laboratories," or equivalent,

b) using a culture method to identify all serogroups of *Legionella pneumophila* and that conforms to ISO 11731, "Water Quality — Enumeration of *Legionella*," or equivalent, and

c) enrolled in a bi-annual external proficiency testing program for recognised approval for testing.

3) The owner of a *building* with a *cooling tower* or a *decorative water feature* shall ensure that the laboratory conducting *Legionella pneumophila* testing for the *cooling tower* or *decorative water feature* has agreed to give immediate notice to the owner, the *Chief Building Official*, and the local medical health officer if the result exceeds a standard set out in Table 2.2.11.6. or 2.2.11.7. that requires such notice to be given.".

12. In Article 2.2.5.1. of Book II, Division B, Council:

a) strikes out the title "Asbestos Cement Pipe and Fittings" and substitutes "Fibrocement Pipe and Fittings"; and

b) in Sentence (1), strikes out "Reserved." and substitutes "Fibrocement pipe and fittings for use in a drain, waste and vent system shall conform to CAN/CSA-B127.3-18, "Fibrocement Drain, Waste, and Vent Pipe and Pipe Fittings."

13. In Book II, Division B, Council adds to the beginning of Table A-2.2.5., 2.2.6. and 2.2.7. in Note A-2.2.5., 2.2.6. and 2.2.7 "Pipe and Fitting Applications", in the Notes to Part 2 the following:

"

Fibrocement DWV pipe Type 1, Class 3000 and Type 2, Class 4000	CAN/CSA-B127.3-18	2.2.5.1.(1).	P	P	P	P	P	N	N	N	N

".

14. In Subsection 2.2.5, Council adds a new Article 2.2.5.15. as follows:

"2.2.5.15. Cellular Core PVC Pipe and Fittings

1) Cellular core PVC pipe shall

a) conform to ASTM F 3128-19, "Poly(Vinyl Chloride) (PVC) Schedule 40 Drain, Waste, and Vent Pipe with a Cellular Core," and

b) be light grey, as specified in CAN/CSA-B181.2, "Polyvinylchloride (PVC) and Chlorinated Polyvinylchloride (CPVC) Drain, Waste, and Vent Pipe and Pipe Fittings."

2) Fittings and solvent cements for cellular core PVC pipe shall conform to CAN/CSA-B181.2, "Polyvinylchloride (PVC) and Chlorinated Polyvinylchloride (CPVC) Drain, Waste, and Vent Pipe and Pipe Fittings."

3) Cellular core PVC pipe shall only be used in residential *buildings* containing 1 or 2 *dwelling units* and row houses that do not exceed 3 *storeys* in height.".

15. In Article 2.2.10.6. of Book II, Division B, Council:

a) in sentence (2), strikes out "Supply fittings and individual shower heads" and substitutes "Except as provided in Sentence (7), supply fittings and individual *shower heads*";
b) strikes out Table 2.2.10.6. and substitutes the following:

"Table 2.2.10.6.
Water Flow Rates from Supply Fittings
Forming Part of Sentence 2.2.10.6.(2)

Supply Fittings	Maximum Water Flow Rate, L/min
Kitchen faucet (non-residential)	8.3
Kitchen faucet (residential)	6.8(1)
Lavatory faucet (for *private* use)	5.7
Lavatory faucet (for *public* use)	1.9(2)
Pre-rinse spray valve	4.8(3)
Shower head	7.6(4)
Wash fountain, per *plumbing fixture* fitting	6.8(5)

Notes to Table 2.2.10.6.:
(1) May be temporarily increased to a maximum flow rate of 8.3 L/min but must default to the lower flow rate upon release of the activation mechanism or closure of the faucet valve.
(2) A *metering fixture* faucet is limited to 1.0 L per cycle.
(3) Each *pre-rinse spray valve* shall be equipped with an automatic shut-off.
(4) Emergency and safety *shower heads* are exempted from this requirement.
(5) A maximum flow rate of 6.8 L/min is permitted for each 500 mm of circumference. For a wash fountain with *metering fixture* faucets, a maximum of one *metering fixture* faucet is permitted for each 500 mm of circumference. A *metering fixture* faucet is limited to 1.0 L per cycle.";

c) in Sentence (3), italicizes the words "shower head" wherever they appear;
d) in Sentence (4), italicizes the words "shower heads" and "shower head" wherever they appear;
e) in Sentence (5), strikes out "Each lavatory" and substitutes "Except as provided in Sentence (7), each lavatory"; and
f) adds a new Sentence (7) as follows:

"7) The requirements of Sentences (2) and (5) do not apply to

a) any part of a *building* classified as Group B within Table 3.1.2.1. of Division B of Book I (General) of this By-law, or

b) a *plumbing fixture* specifically identified in a *building*'s water management plan that conforms to ANSI/ASHRAE 188, "Legionellosis: Risk Management for Building Water Systems" and is signed by a *registered professional*.".

16. In Sentence 2.2.10.8.(1) of Book II, Division B, Council:

a) in Clause (c), strikes out "and" at the end of the Clause;
b) in Clause (d), strikes out "." at the end of the Clause and substitutes ", and"; and
c) adds a new Clause (e) as follows:

"e) conform to ASSE 1037-2015/ASME A112.1037-2015/CSA B125.37-15, "Performance Requirements for Pressurized Flushing Devices for Plumbing Fixtures.""".

17. In Sentence 2.2.10.10.(2) of Book II, Division B, Council strikes out "CSA B125.3, "Plumbing Fittings."" and substitutes "ASSE 1002-2015/ASME A112.1002-2015/CSA B125.12-15, "Anti-Siphon Fill Valves for Water Closet Tanks."".

18. In Clause 2.2.10.17.(1)(b) of Book II, Division B, Council adds "a minimum of 8.5 in by 11 in in size and" before "securely fastened".

19. In Subsection 2.2.10., Council adds a new Article 2.2.10.18. as follows:

"2.2.10.18. Flexible Water Connectors

1) Flexible water connectors exposed to continuous pressure shall conform to ASME A112.18.6-2017/CSA B125.6-17, "Flexible Water Connectors."".

20. In Article 2.2.11.1. of Book II, Division B, Council:

a) in Sentence (1), strikes out "Appliances", and substitutes "Except when a clothes washer is supplied by an *alternate water source system*, appliances"; and
b) in Sentence (2), strikes out "Clothes washers", and substitutes "Except when a clothes washer is supplied by an *alternate water source system*, clothes washers".

21. In Article 2.2.11.3. of Book II, Division B, Council:

a) in Sentence (1), strikes out "The maximum", and substitutes "Except when a vehicle wash facility is supplied by an alternate water source system, the maximum";
b) in Clause (2)(a), strikes out "a water recycling system", and substitutes "except when a vehicle wash facility is supplied by an alternate water source system, a water recycling system"; and
c) adds a new Sentence (3) as follows:

"3) Where a vehicle wash facility is supplied by an *alternate water source system*, disinfection of the non-*potable* water shall be provided at the vehicle wash facility at point of use by ultraviolet

light and conform to NSF/ANSI 55, “Ultraviolet Microbiological Water Treatment Systems,” Class A.”.

22. In Clause 2.2.11.4.(2)(b) of Book II, Division B, Council adds “a minimum of 8.5 in by 11 in in size and” before “securely fastened”.

23. In Book II, Division B, Council strikes out Article 2.2.11.6 and substitutes the following:

“2.2.11.6. Cooling Towers
(See Article 6.3.2.15. of Division B of Book I (General) of this By-law.)

1) An *operating permit* shall be obtained for the installation of a *cooling tower*, or the retention of an existing *cooling tower*.

2) In order to obtain an *operating permit* for the installation of a *cooling tower*, a service contract must be in place with a qualified service provider to perform maintenance of the *cooling tower* for a minimum of one year.

3) The *operating permit* number assigned to the *cooling tower* shall be posted on a sign or plate that is a minimum of 8.5 in by 11 in in size and securely fastened to the *cooling tower* in a location that is conspicuously visible and constructed of a durable, weather resistant material.

4) The *Chief Building Official* shall be notified, in the form prescribed by the *Chief Building Official*,
a) within 5 days of any start-up or shut down of a *cooling tower*,
b) within 5 days of any *Legionella pneumophila* test result from a *cooling tower*, or sooner as required by Sentence (8), and
c) within 30 days of any changes to the information that was last provided to the *City* with regard to the *operating permit.*

5) A maintenance log shall be maintained for each *cooling tower* and shall include
a) the address and location of the *cooling tower*,
b) the *operating permit* number assigned to the *cooling tower*,
c) emergency contact information and the name and contact information of the owner,
d) a description of the location of the operating manual for the *cooling tower*, and as applicable, the location of safety data sheets and the location of the water management plan,
e) a single line schematic plan, including water sampling locations, of the *cooling tower* system,
f) details of any changes or alterations made to the system at any time since January 1, 2021,
g) a record of inspections and any maintenance performed within the last 24 months,
h) a record of operational disruptions within the last 24 months and the corrective actions taken,
i) a record of chemical treatments applied and dosages within the last 24 months,
j) a record of all water quality results from analyses performed within the last 24 months, and for *Legionella pneumophila* test results, the name of the person and company collecting the sample and the name of the company conducting the laboratory test, and
k) if a laboratory result fails to meet a standard defined in Table 2.2.11.6., a description of the extent of the deviation from the standard, the corrective action taken, a record of any required notification, and the outcome of the corrective action, including all applicable dates and times.

6) The maintenance log shall be made available on such request to the *Chief Building Official*.

7) *Legionella pneumophila* testing shall be conducted

a) in accordance with Article 2.2.1.7.,

b) on water samples collected at a point in the recirculation loop just prior to the point where treatment chemicals are injected, or where this is not feasible, from a location representative of water in the system,

c) no less than 48 hours and no more than 5 days after completion of system start-up and disinfection, and

d) as required by Sentence (8).

8) If a laboratory test shows that a *Legionella* result exceeds a standard set out in Table 2.2.11.6., the response set out in Table 2.2.11.6 shall be undertaken. (See Note A-2.2.11.6.(8).)

Table 2.2.11.6.
Required Response to Failure to Meet *Legionella* Standards for *Cooling Towers*
Forming part of Sentence 2.2.11.6.(8)

Test Type	Test Result	Required Response
Legionella pneumophila culture test(1)	10 or more CFU / mL and less than or equal to 1,000 CFU / mL	1. The owner shall give notice to the *Chief Building Official* within 24 hours. 2. The owner shall, within 24 hours, either a) shut down the *cooling tower* system and perform offline cleaning and disinfection, or b) perform online remedial treatment(2) and within 7 days shut down the *cooling tower* system and perform offline cleaning and disinfection. 3. The owner shall perform a *Legionella* culture test(1) no less than 48 hours and no more than 5 days after cleaning and disinfection.
Legionella pneumophila culture test(1)	Greater than 1,000 CFU / mL	1. The laboratory shall immediately give notice to the owner, the *Chief Building Official* and the medical health officer(3), and in addition, an owner who receives notice from the laboratory must give immediate notice to the *Chief Building Official* advising that the owner has been notified by the laboratory(4). 2. The owner shall immediately implement measures that will eliminate water dispersion by aerosol from the affected *cooling tower* system and then perform offline cleaning and disinfection of the system before putting the system back into service. 3. The owner shall perform a *Legionella* culture test(1) no less than 48 hours and no more than 5 days after cleaning and disinfection.

Notes to Table 2.2.11.6.:

(1) The *Legionella pneumophila* culture test shall conform to the requirements of Article 2.2.1.7.

(2) Online remedial treatment is also known as “running disinfection.”

(3) See Sentence 2.2.1.7.(3).

(4) The person giving the immediate notice shall take all reasonable steps to give notice by speaking directly to or by telephone with each person required to be notified, a person designated for this purpose by the person required to be notified, or a person answering the telephone number designated for this purpose by the person required to be notified, and follow with notice in writing to each person within 24 hours.

9) Offline cleaning and disinfection of a *cooling tower* shall be carried out

a) a minimum of once every calendar year,
b) for any start-up at any time, and
c) as required by Sentence (8).

10) When a *cooling tower* has been shut down for more than 3 days, it shall be drained within 5 days of being shut down, or when this is not practical during shut downs of short duration, stagnant water shall be pre-treated with an appropriate biocide regimen before start-up, allowing for proper contact time according to the supplier's recommendations.

11) If a *cooling tower* is removed or its use is permanently discontinued, it shall be safely drained, thoroughly sanitized, and the make-up water line shall be disconnected and capped.".

24. In the Notes to Part 2 in Book II, Division B, Council adds a new note as follows:

"Note A-2.2.11.6.(8). Required Response to Failure to Meet *Legionella* Standards. This Sentence is based on Public Services and Procurement Canada's standard MD 15161 – 2013 Control of *Legionella* in Mechanical Systems.".

25. In Book II, Division B, Council strikes out Article 2.2.11.7. and substitutes the following:

"2.2.11.7. Decorative Water Features
(See Article 6.3.2.16. of Division B of Book I (General) of this By-law.)

1) An *operating permit* shall be obtained for the installation of a *decorative water feature*, or the retention of an existing *decorative water feature* except for a *decorative water feature* in a *building* used exclusively for residential occupancy containing no more than four principal *dwelling units*.

2) The following shall be posted in a location that is conspicuously visible:

a) the *operating permit* number assigned to the *decorative water feature*, on a sign or plate that is a minimum of 8.5 in by 11 in in size, constructed of a durable, weather resistant material and securely fastened to the *decorative water feature* or its associated mechanical equipment, and,
b) an advisory that the *decorative water feature* is not intended for human access, printed using a minimum letter height of 4 in and located around the perimeter of, or near an obvious access point to, the *decorative water feature*.

3) The *Chief Building Official* shall be notified, in the form prescribed by the *Chief Building Official*,

a) within 5 days of any start-up of a *decorative water feature* that had been shut down for 3 or more consecutive days,
b) within 5 days of any *decorative water feature* shut down for 3 or more consecutive days,
c) within 5 days of any *Legionella pneumophila* test result from a *decorative water feature*, or sooner as required by Sentence (8), and
d) within 30 days of any changes to the information that was last provided to the *City* with regard to the *operating permit*.

4) Where an outdoor *decorative water feature* is provided as an auxiliary system to a *building*, then the outdoor *decorative water feature* shall be considered part of the *building* for the purposes of this Article.

5) A maintenance log shall be maintained and shall include
a) the address and location of the *decorative water feature*,
b) the *operating permit* number assigned to the *decorative water feature*,
c) emergency contact information and the name and contact information of the owner,
d) a description of the location of the operating manual for the *decorative water feature*, and as applicable, the location of safety data sheets and the location of the water management plan,
e) a single line schematic plan, including water sampling locations, of the *decorative water feature*,
f) details of any changes or alterations made to the system at any time since January 1, 2021,
g) a record of inspections and any maintenance performed within the last 24 months,
h) a record of operational disruptions within the last 24 months and the corrective actions taken,
i) a record of chemical treatments applied and dosages within the last 24 months,
j) a record of all water quality results from analyses performed within the last 24 months, and for *Legionella pneumophila* test results, the name of the person and company collecting the sample and the name of the company conducting the laboratory test, and
k) if a laboratory result fails to meet a standard defined in Table 2.2.11.7., a description of the extent of the deviation from the standard, the corrective action taken, a record of any required notification, and the outcome of the corrective action, including all applicable dates and times.

6) The maintenance log shall be made available on such request to the *Chief Building Official*.

7) *Legionella pneumophila* testing shall be conducted
a) in accordance with Article 2.2.1.7.,
b) on water samples collected at a point representative of water that is aerosolized, or where this is not feasible or aerosolization is not obvious, from a location
i) prior to the point where treatment chemicals are injected in a recirculating system, or
ii) representative of water in the system in a non-recirculating system, and
c) as required by Sentence (8).

8) If a laboratory test shows that the *Legionella* result exceeds a standard set out in Table 2.2.11.7., the response set out in Table 2.2.11.7 shall be undertaken.

Table 2.2.11.7.
Required Response to Failure to Meet *Legionella* Standards for *Decorative Water Features*
Forming part of Sentence 2.2.11.7.(8)

Test Type	Test Result	Required Response
Legionella pneumophila culture test(1)	10 or more CFU / mL and less than or equal to 1,000 CFU / mL	1. The owner shall give notice to the *Chief Building Official* within 24 hours. 2. The owner shall, within 24 hours, shut down the system and perform offline cleaning and disinfection. 3. The owner shall perform a *Legionella* culture test(1) no less than 48 hours and no more than 5 days after cleaning and disinfection.

Legionella pneumophila culture test(1)	Greater than 1,000 CFU / mL	1. The laboratory shall immediately give notice to the owner, the *Chief Building Official* and the medical health officer(2), and in addition, an owner who receives notice from the laboratory must give immediate notice to the *Chief Building Official* advising that the owner has been notified by the laboratory(3). 2. The owner shall immediately implement measures that will eliminate water dispersion by aerosol from the *decorative water feature* and then perform offline cleaning and disinfection of the system before putting the feature back into service. 3. The owner shall perform a *Legionella* culture test(1) no less than 48 hours and no more than 5 days after cleaning and disinfection.

Notes to Table 2.2.11.7.:
(1) The *Legionella pneumophila* culture test shall conform to the requirements of Article 2.2.1.7.
(2) See Sentence 2.2.1.7.(3).
(3) The person giving the immediate notice shall take all reasonable steps to give notice by speaking directly to or by telephone with each person required to be notified, a person designated for this purpose by the person required to be notified, or a person answering the telephone number designated for this purpose by the person required to be notified, and follow with notice in writing to each person within 24 hours.

9) Offline cleaning and disinfection of a *decorative water feature* shall be carried out
a) as recommended by the manufacturer, and at minimum of once every calendar year,
b) for any start-up after having been shut down for 3 or more consecutive days, and
c) as required by Sentence (8).

10) When a *decorative water feature* has been shut down for 3 or more consecutive days, it shall be drained within 5 days of being shut down.

11) If a *decorative water feature* is removed or its use is permanently discontinued, it shall be safely drained, thoroughly sanitized, and the make-up water line shall be disconnected and capped.".

26. In Article 2.4.2.3. of Book II, Division B, Council:

a) in Clause (1)(a), strikes out "and" at the end of the Clause;
b) in Clause (2)(a), strikes out "and" at the end of the Clause;
c) in Clause (3)(a), strikes out "and" at the end of the Clause;
d) in Clause (1)(b), strikes out "." and substitutes ", and";
e) in Clause (2)(b), strikes out "." and substitutes ", and";
f) in Clause (3)(b), strikes out "." and substitutes ", and";
g) adds a new Clause 1(c) as follows:

"c) is located within a single room or *suite.*";

h) adds a new Clause 2(c) as follows:

"c) is located within a single room or *suite.*"; and

i) adds a new Clause 3(c) as follows:

"c) is located within a single room or *suite.*".

27. In Book II, Division B, Council strikes out Article 2.4.2.4. and substitutes the following:

"2.4.2.4. Connections to Storm Drainage Systems

1) Except as provided in Sentence (2), all roof and paved areas shall drain to a *storm drainage system*.

2) *Building* and site drainage need not connect to a *storm drainage system* if on-site rainwater or *storm water* management practices are employed and

a) rainwater or *storm water* does not create a hazardous condition or discharge upon or impact other lands or sites and

b) overflow is drained to a *storm drainage system*. (See Sentence 2.4.2.2.(1).)".

28. In Article 2.4.6.4. in Book II, Division B, Council:

a) in Sentence (1), strikes out "(See Note A-2.4.6.4.(1).)";
b) in Sentence (3), strikes out "a gate valve or";
c) in Sentence (4), strikes out "Where the *fixture* is a floor drain, a removable screw cap is permitted to be installed on the upstream side of the *trap*.", and substitutes "Deleted."; and
d) in Sentence (5), strikes out "gate valve or".

29. In the Notes to Part 2 in Book II, Division B, Council strikes out Note A-2.4.6.4.(1) "Backwater Valve or Gate Valve.".

30. In Table 2.4.9.3. in Book II, Division B, Council strikes out the rows for "Shower Drain" and substitutes the following:

"

Shower drain Total volume of discharge from all *shower heads*: (a) < 9.5 LPM	1½	1½
(b) 9.5 LPM to 20 LPM	2	3
(c) > 20 LPM	3	6

".

31. In Sentence 2.6.1.12.(1) in Book II, Division B, Council strikes out the word “electric”.

32. In the Notes to Part 2 in Book II, Division B, Council strikes out the text in Note A-2.6.1.12.(1) beginning with “Contemporary electric water heater tanks” to the end of the note.

33. In Book II, Division B, Council strikes out Article 2.6.3.3. and substitutes the following;

“2.6.3.3. Static Pressure
(See Sentence 2.2.11.2.(2).)

1) Where the static pressure at any *fixture* may exceed 550 kPa, a pressure-reducing valve shall be installed to limit the maximum static pressure at the *fixture* to 550 kPa.”.

34. In Book II, Division B, Council strikes out Section 2.7., and substitutes the following:

“Section 2.7. Non-Potable Water Systems

2.7.1. Connection

2.7.1.1. General

1) A non-*potable water system* shall not be connected to a *potable water system*.

2) For the purpose of this Section

a) all non-*potable water systems* shall comply with Subsections 2.7.1., 2.7.2. and 2.7.3.,

b) an *alternate water source system* installed prior to January 1, 2019 shall comply with Subsection 2.7.4., and

c) an *alternate water source system* installed on or after January 1, 2019 shall comply with Subsections 2.7.5., 2.7.6., 2.7.7., and 2.7.8.

2.7.1.2. Non-*potable* Water Sources

1) A non-*potable water system* shall collect only

a) rainwater from roof surfaces or similar areas:

i) that do not allow the passage of vehicular traffic,
ii) that are above grade, and
iii) where hydrocarbon-based fuels, hazardous materials, or fertilizers are not stored or used on such surfaces, or

b) *clear-water waste*, or

c) both.

2) A non-*potable water system* shall not collect *perimeter drainage water*, *groundwater*, *storm water*, *greywater*, or *blackwater*.

2.7.1.3. Non-*potable* Water Uses

1) Except as provided in Sentence (2), a non-*potable water system* may use treated non-*potable* water for any of the uses set out in Columns A or B of Table 2.7.1.3.

2) An *alternate water source system* shall use treated non-*potable* water in lieu of *potable* water for all of the uses set out in Column A of Table 2.7.1.3.

3) Non-*potable* water shall not be used in lieu of *potable* water for any other uses.

Table 2.7.1.3.
Uses for Treated Non-*potable* Water
Forming Part of Sentences 2.7.1.3.(1), (2) and (3)

<table>
<tr><th rowspan="2">Non-potable Water Source</th><th colspan="2">Uses for Treated Non-potable Water</th></tr>
<tr><th>Column A</th><th>Column B</th></tr>
<tr><td>Rainwater as specified by Clause 2.7.1.2.(1)(a)</td><td rowspan="2">Water closets, urinals, and trap primers</td><td rowspan="2">Irrigation of non-food purpose plants, clothes washers, vehicle wash facilities(1), make-up water for hydronic systems, make-up water for cooling towers, and tempering of discharge.</td></tr>
<tr><td>Clear-water waste</td></tr>
<tr><td>Groundwater</td><td colspan="2" rowspan="5">Not permitted</td></tr>
<tr><td>Perimeter drainage water</td></tr>
<tr><td>Storm water</td></tr>
<tr><td>Greywater</td></tr>
<tr><td>Blackwater</td></tr>
</table>

Notes to Table 2.7.1.3.:
(1) See Article 2.2.11.3.

4) Where the static pressure at any *fixture* in a non-*potable water system* may exceed 550 kPa, a pressure-reducing valve shall be installed to limit the maximum static pressure at the *fixture* to 550 kPa.

2.7.2. Identification

2.7.2.1. Piping and Outlet Identification

1) All non-*potable* water distribution system piping shall be purple in colour and conform to the requirements of NSF-rw and NSF/ANSI 14, “Plastics Piping System Components and Related Materials.”

2) All other non-*potable* water piping shall be identified and marked in accordance with CAN/CSA-B128.1, “Design and Installation of Non-Potable Water Systems.”

3) Non-*potable* water outlets shall be identified by a sign or plate in a location that is conspicuously visible and constructed of a durable, weather resistant material.

2.7.3. Location

2.7.3.1. Pipes

1) Non-*potable* water piping shall not be located directly above

a) areas where food, drink or products that are intended for human consumption are prepared, handled, dispensed or stored, or

b) a non-pressurized or pressurized *potable* water tank.

2.7.3.2. Outlets

1) An outlet from a non-*potable water system* shall not be located where it can discharge into

a) a sink or lavatory,

b) a *fixture* into which an outlet from a *potable water system* is discharged, or

c) a *fixture* that is used for the preparation, handling or dispensing of food, drink or products that are intended for human consumption.

(See Note A-2.7.3.2.(1).)

2.7.4. Alternate Water Source Systems Installed Prior to January 1, 2019

2.7.4.1. Requirements for Alternate Water Source Systems Installed Prior to January 1, 2019

1) An *operating permit* shall be obtained.

2) The *operating permit* number assigned to the *alternate water source system* shall be posted on a sign or plate that is a minimum of 8.5 in by 11 in in size and securely fastened to the *alternate water source system* in a location that is conspicuously visible and constructed of a durable, weather resistant material.

3) The *Chief Building Official* shall be notified within 30 days of any changes to the information that was last provided to the *City* with regard to the operating permit, in the form prescribed by the *Chief Building Official*.

4) Water quality shall comply with the water quality standards, testing, documentation, and reporting requirements set out in Articles 2.7.7.1. and 2.7.7.2.

5) If a test result shows that the water quality fails to meet any of the standards set out in Table 2.7.7.1., the response set out in Table 2.7.4.1. shall be undertaken.

Table 2.7.4.1.
Required Response to Failure to Meet Water Quality Standards for *Alternate Water Source Systems* Installed Prior to January 1, 2019
Forming Part of Sentence 2.7.4.1.(5)

Parameter	Test Result	Required Response
E. coli(1)	100 or more CFU per 100 mL or 100 or more MPN per 100 mL	1. The *owner* shall immediately supply the *alternate water source system* with *potable* water only; 2. The *owner* shall give notice to the *Chief Building Official* within 24 hours; and 3. The *owner* shall perform an *E. coli* test(1) and a *Legionella* culture test(1) within 5 days, but no less than 48 hours after any cleaning or disinfection.
Legionella pneumophila(1)	10 or more CFU per mL	
Turbidity	> 15 NTU	
Temperature	> 25°C	

Notes to Table 2.7.4.1.:
(1) See Article 2.2.1.7.

6) The *alternate water source system* shall be maintained in accordance with any manufacturer's specifications.

7) If the *alternate water source system* is in use, cross connection control tests shall be performed as required by CAN/CSA-B128.1, "Design and Installation of Non-Potable Water Systems."

2.7.4.2. No Other Requirements

1) *Alternate water source systems* installed prior to January 1, 2019 need not comply with any other requirements set out in Subsections 2.7.5. through 2.7.8.

2.7.5. Alternate Water Source Systems

2.7.5.1. Occupancy

1) Before occupancy of a *building* is permitted, an *alternate water source system* shall be commissioned in accordance with Article 2.7.5.2., and an *operating permit* shall be obtained in accordance with Article 2.7.5.3.

2.7.5.2. Commissioning

1) In order to commission an *alternate water source system*

a) the treated non-*potable* water shall be tested for *E. coli*, turbidity and *Legionella pneumophila*,
i) in accordance with Article 2.2.7.1.,
ii) on water samples collected from the sampling port required by Article 2.7.6.6.,
iii) weekly for a period of 4 weeks for *E. coli* and turbidity, and
iv) once for *Legionella pneumophila*,

b) test results shall be provided to the *Chief Building Official*, and

c) written confirmation that the *alternate water source system* operates in conformance with the operating manual shall be provided to the *Chief Building Official* by the *registered professional of record*, and a cross connection control test shall be performed and witnessed by the *Chief Building Official*.

2) If a water sample required by this Article fails to meet the standards set out in Table 2.7.7.1., an additional water sample shall be collected no less than 48 hours after any cleaning or disinfection, tested, and reported.

2.7.5.3. Operating Permit

1) An *operating permit* shall be obtained for an *alternate water source system*.

2) The *operating permit* number assigned to the *alternate water source system* shall be posted on a sign or plate that is a minimum of 8.5 in by 11 in in size and securely fastened to the *alternate water source system* in a location that is conspicuously visible and constructed of a durable, weather resistant material.

3) The *Chief Building Official* shall be notified within 30 days of any changes to the information that was last provided to the *City* with regard to the *operating permit*, in the form prescribed by the *Chief Building Official*.

2.7.5.4. Continued Operation

1) Once an *operating permit* has been issued, an *alternate water source system* shall operate continuously unless written approval to discontinue its use has been obtained from the *Chief Building Official* or *City Engineer*.

2.7.6. Design

2.7.6.1. Professional Design

1) An *alternate water source system* shall be designed by a *registered professional* and shall be designed to prioritize the use of non-*potable* water.

2.7.6.2. Pipe Sizing

1) Except as required by Sentence (2), non-*potable* distribution piping shall be sized according to Subsection 2.6.3.

2) *Dwelling units* within a *building* with an *alternate water source system* shall be equipped with

a) tank type water closets, and

b) non-*potable* distribution piping sized in conformance with the IAPMO Water Demand Calculator.

2.7.6.3. Continuity of Supply and Backflow Prevention

1) A secondary water supply shall be provided.

2) An *air gap* at least two times the size of the discharge opening shall be installed for the *potable* water make-up supply.

2.7.6.4. Cisterns

(See Article 2.4.2.2. and Note A-2.7.6.4., 2.7.6.5. and 2.7.6.6.)

1) Provision shall be made upstream of the *cistern* to remove the accumulation of particulates and impurities before they enter the *cistern*.

2) *Cisterns* shall be secured to prevent tampering and unintended or unauthorized entry either by a lockable device or another *approved* method, and all penetrations shall be sealed to prevent insect or vermin entry.

3) Water shall be withdrawn a minimum of 0.3 m from the base of the *cistern*.

2.7.6.5. Water Metering

(See Note A-2.7.6.4., 2.7.6.5. and 2.7.6.6.)

1) A water meter shall be installed and located within 1.5 m of the *potable* water make-up supply and shall be capable of recording the volume of *potable* water being supplied.

2) A water meter shall be installed and located on the non-*potable* water outlet prior to distribution and shall be capable of recording the volume of non-*potable* water being supplied to the distribution piping.

3) Water meters required by Sentences (1) and (2) shall be capable of displaying volumes in units of L or cubic m.

2.7.6.6. Water Quality Sampling and Alerts

(See Article 2.2.1.7. and Note A-2.7.6.4., 2.7.6.5. and 2.7.6.6.)

1) A sampling port, and provision for continuous in-line measurements required in order to conform with Table 2.7.7.1., shall be installed and located downstream of the water meter at the non-*potable* water outlet and prior to distribution.

2) All monitoring devices referred to in Sentence (1) shall be capable of activating an *alert* that is designed to activate continuously for the duration of the *alert* condition whenever the water quality fails to meet the standards set out in Table 2.7.7.1.

2.7.6.7. Power Interruption

1) If a *building* is required to have an emergency system generator, provision shall be made for the continued operation of any mandatory uses for non-*potable* water described in Sentence 2.7.1.3.(2) in the event of a power interruption.

2.7.7. Water Quality Standards

2.7.7.1. Water Quality Standards, Testing, and Documentation

1) Water quality shall meet the standards set out in Table 2.7.7.1.

2) Water quality shall be tested as set out in Table 2.7.7.1.

3) All test results shall be documented as set out in Table 2.7.7.1., and documentation shall be retained for no less than 24 months.

Table 2.7.7.1.
Water Quality Standards, Testing, and Documentation
Forming Part of Sentences 2.7.7.1.(1), (2), and (3)

Applicability	Parameter	Standard	Testing Type and Frequency	Testing Result Documentation Requirement
Any non-*potable* water source	Temperature	< 20°C	Continuous	Daily(1)
Any non-*potable* water source	Turbidity	< 10 NTU	Daily(1), and 1 sample tested by a laboratory every 2 months with not more than 63 days between samples	Daily(1), plus all laboratory tests
Any non-*potable* water source	*E. coli*(2)	< 100 CFU per 100 mL or < 100 MPN per 100 mL	1 sample tested every 2 months with not more than 63 days between samples	All laboratory tests
Any non-*potable* water source	*Legionella pneumophila*(2)	< 10 CFU per mL	As required by Article 2.7.5.2.	All laboratory tests

Notes to Table 2.7.7.1.:
(1) For the purpose of this Table, the term “daily” shall mean once per day when the *building* is normally occupied.
(2) See Article 2.2.1.7.

2.7.7.2. Water Quality Reporting

1) Water quality reports shall be submitted to the *Chief Building Official* before the end of the second month following the issuance of an *operating permit*, and then every 2 months thereafter, and shall include

a) all documentation required by Sentence 2.7.7.1.(3) and

b) except as provided in Sentence 2.7.4.2.(1), readings from the water meters required by Article 2.7.6.5.

2.7.7.3. Required Response to Failure to Meet Water Quality Standards

1) If a test result shows that the water quality fails to meet a standard set out in Table 2.7.7.1., the response set out in Table 2.7.7.3 shall be undertaken.

Table 2.7.7.3.
Required Response to Failure to Meet Water Quality Standards for *Alternate Water Source Systems*
Forming Part of Sentence 2.7.7.3.(1)

Parameter	Test Result	Required Response
Turbidity	Between 10 and 15 NTU	The *owner* shall take the appropriate corrective action as set out in the operating manual.
Temperature	20°C to 25°C	
E. coli(1)	100 or more CFU per 100 mL or 100 or more MPN per 100 mL	1. The *owner* shall immediately supply the *alternate water source system* with *potable* water only; 2. The *owner* shall give notice to the *Chief Building Official* within 24 hours; 3. The *owner* shall take the appropriate corrective action as set out in the operating manual; and 4. The *owner* shall perform an *E. coli* test(1) and a *Legionella* culture test(1) within 5 days, but no less than 48 hours after any cleaning or disinfection.
Legionella pneumophila(1)	10 or more CFU per mL	
Turbidity	> 15 NTU	
Temperature	> 25°C	

Notes to Table 2.7.7.3.:
(1) See Article 2.2.1.7.

2.7.8. Operating Manual and Maintenance

2.7.8.1. Operating Manual

1) An operating manual shall be supplied to the *owner* or representative of the owner by the designer of the *alternate water source system* and shall be stamped by a *registered professional of record*, and shall include the following

a) address and location of the *alternate water source system*,
b) system designer contact details,
c) a simplified process flow diagram,
d) a schematic of the entire system showing locations of all system components,
e) instructions on operating, maintaining, and inspecting the system,
f) required frequency of maintenance and inspections,
g) instructions on deactivating and restarting the system for repair or other purposes,
h) details on the corrective action that shall be taken if the water quality fails to meet the standards set out in Table 2.7.7.1., and
i) safety data sheets.

2.7.8.2. Maintenance

1) *Alternate water source systems* shall be maintained in accordance with the operating manual and any manufacturer's specifications.

2) Cross connection control tests shall be performed as required by CAN/CSA-B128.1, "Design and Installation of Non-Potable Water Systems."

3) A maintenance log shall be maintained and shall include

a) the address and location of the *alternate water source system*,
b) the name and contact information of the *owner*,
c) a record of inspections and any maintenance performed within the last 24 months,
d) details of any changes or alterations made to the system at any time after commissioning,
e) a record of water quality test results as set out in Article 2.7.7.1., including the name of the person and company conducting the test,
f) copies of water quality reports prepared and submitted in accordance with Article 2.7.7.2 within the last 24 months, and
g) if a water quality test fails to meet a standard defined in Table 2.7.7.1., a description of the extent of the deviation from the standard, the corrective action taken, a record of any required notification, and the outcome of the corrective action, including all applicable dates and times.

2.7.8.3. Request for Operating Manual or Maintenance Log

1) The operating manual and the maintenance log shall be made available on such request to the *Chief Building Official* or *City Engineer*.".

35. In the Notes to Part 2 in Book II, Division B, Council renumbers Note A-2.7.6.7, 2.7.6.8 and 2.7.6.9 as Note A-2.7.6.4, 2.7.6.5 and 2.7.6.6.

36. In Book II, Division B, Table 2.8.1.1., Council:

a) adds, in correct numerical order, as follows:

“

2.2.1.7. Microbiological Testing	
(1)	[F40,F41,F43,F81,F82-OS3.4,OH5]
(2)	[F40,F41,F43,F81,F82-OS3.4,OH5]
(3)	[F30,F40,F41,F43,F81,F82-OS3.1,OS3.4,OH1.1,OH2.1,OH2.3,OH5]

”;

b) strikes out all of the rows for section “2.2.5.1. Asbestos-Cement Pipe and Fittings”, including the title, and substitutes as follows:

“

2.2.5.1. Fibrocement Pipe and Fittings	
(1)	[F20-OH2.1] [F20-OP5]
(3)	[F40-OH2.4] [F41,F43-OP5] as it applies to the installation of piping

”;

c) adds, in correct numerical order, as follows:

“

2.2.5.15. Cellular Core PVC Pipe and Fittings	
(1)	[F20-OH2.1,OH2.2,OH2.3] [F20-OP5]
(2)	[F20-OH2.1,OH2.2,OH2.3] [F20-OP5]

”;

d) adds a new row under the title “2.2.10.6. Supply and Waste Fittings”, in the correct numerical order, as follows:

“

(7)	[F40,F41,F43,F46,F71,F81,F82-OS3.4,OH1.1,OH2.3,OH5]

”;

e) strikes out all of the rows for section “2.2.10.8. Direct Flush Valves”, including the title, and substitutes as follows:

“

2.2.10.8. Direct Flush Valves	
(1)	[F81-OH2.1]
	(a), (b) and (e) [F81-OP5]

”;

f) adds, in correct numerical order, as follows:

“

2.2.10.18. Flexible Water Connectors

(1)	[F81-OP5] [F46-OH2.2]

";

g) adds a new row under the title "2.2.11.3. Vehicle Wash Facilities", in the correct numerical order, as follows:

"

(3)	[F40,F41,F43,F81,F82-OS3.4,OH1.1,OH5]

";

h) strikes out all of the rows for section "2.2.11.6. Cooling Towers", including the title, and substitutes as follows:

"

2.2.11.6. Cooling Towers	
(1)	[F40,F41,F43,F46,F81,F82-OS3.4,OH1.1,OH2.2,OH5,OP5]
(2)	[F40,F41,F43,F46,F81,F82,F130-OS3.4,OH1.1,OH2.2,OH5,OP5,OE1.2]
(4)	[F40,F41,F43,F46,F81,F82-OS3.4,OH1.1,OH2.2,OH5,OP5]
(5)	[F40,F41,F43,F46,F81,F82,F130-OS3.4,OH1.1,OH2.2,OH5,OP5,OE1.2]
(7)	[F40,F41,F43,F81,F82-OS3.4,OH1.1,OH5]
(8)	[F40,F41,F43,F81,F82-OS3.4,OH1.1,OH5]
(9)	[F40,F41,F43,F81,F82-OS3.4,OH1.1,OH5]
(10)	[F40,F41,F43,F81,F82-OS3.4,OH1.1,OH5]
(11)	[F40,F41,F43,F46,F81,F82,F130-OS3.4,OH1.1,OH2.2,OH5,OP5,OE1.2]

";

i) strikes out all of the rows for section "2.2.11.7. Indoor and Outdoor Decorative Water Features", including the title, and substitutes as follows:

"

2.2.11.7. Decorative Water Features	
(1)	[F40,F41,F43,F46,F81,F82-OS3.4,OH1.1,OH2.2,OH5,OP5]

(2)	[F30-OS3.1,OS3.4,OH2.2,OH2.4,OH5]
(3)	[F40,F41,F43,F46,F81,F82-OS3.4,OH1.1,OH2.2,OH5,OP5]
(5)	[F40,F41,F43,F46,F81,F82,F130-OS3.4,OH1.1,OH2.2,OH5,OP5,OE1.2]
(7)	[F40,F41,F43,F81,F82-OS3.4,OH1.1,OH5]
(8)	[F40,F41,F43,F81,F82-OS3.4,OH1.1,OH5]
(9)	[F40,F41,F43,F81,F82-OS3.4,OH1.1,OH5]
(10)	[F40,F41,F43,F81,F82-OS3.4,OH1.1,OH5]
(11)	[F40,F41,F43,F46,F81,F82,F130-OS3.4,OH1.1,OH2.2,OH5,OP5,OE1.2]

";

j) adds, in correct numerical order, as follows:

"

2.4.2.4. Connections to Storm Drainage Systems	
(2)	[F30,F62,F81,F82-OS3.1,OP5]

"; and

k) strikes out all of the rows commencing with "2.7.1.1. Not Permitted", including the titles, up to and including the last row of the table, and substitutes as follows:

"

2.7.1.1. General	
(1)	[F46-OH2.2]
2.7.1.2. Non-*potable* Water Sources	
(1)	[F40,F43,F46,F81-OS3.4,OH2.1,OH2.2,OH5,OE1.2]
(2)	[F40,F43,F46,F81-OS3.4,OH2.1,OH2.2,OH5,OE1.2]
2.7.1.3. Non-*potable* Water Uses	
(1)	[F130-OE1.2]
(2)	[F130-OE1.2]
(3)	[F46,F70-OS3.4,OH2.2,OH2.3]
(4)	[F81-OS3.2]
2.7.2.1. Piping and Outlet Identification	
(1)	[F46-OH2.2]
(2)	[F46-OH2.2]
(3)	[F46-OH2.2]
2.7.3.1. Pipes	

(1)	[F46-OH2.2]
2.7.3.2. Outlets	
(1)	[F46-OH2.2]
2.7.4.1. Requirements for Alternate Water Source Systems Installed Prior to January 1, 2019	
(1)	[F46,F81,F82,F130-OS3.4,OH2.1,OH2.2,OH5,OE1.2]
(2)	[F81-OH2.2]
(3)	[F46,F81,F82,F130-OS3.4,OH2.1,OH2.2,OH5,OE1.2]
(4)	[F46,F81,F82,F130-OS3.4,OH2.1,OH2.2,OH5,OE1.2]
(5)	[F46,F81,F82,F130-OS3.4,OH2.1,OH2.2,OH5,OE1.2]
(6)	[F46,F81,F82,F130-OS3.4,OH2.1,OH2.2,OH5,OE1.2]
(7)	[F46,F81,F82-OS3.4,OH2.1,OH2.2,OH5]
2.7.5.1. Occupancy	
(1)	[F46,F81,F82,F130-OS3.4,OH2.1,OH2.2,OH5,OE1.2]
2.7.5.2. Commissioning	
(1)	[F46,F81,F82-OS3.4,OH2.1,OH2.2,OH5]
(2)	[F46,F81,F82-OS3.4,OH2.1,OH2.2,OH5]
2.7.5.3. Operating Permit	
(1)	[F40,F41,F43,F46,F81,F82,F130-OS3.4,OH2.1,OH2.2,OH5,OE1.2]
(3)	[F40,F41,F43,F46,F81,F82,F130-OS3.4,OH1.1,OH2.2,OH5,OE1.2]
2.7.5.4. Continued Operation	
(1)	[F81,F82,F130-OH5,OP5,OE1.2]
2.7.6.1. Professional Design	
(1)	[F46,F81,F82,F130-OS3.4,OH2.1,OH2.2,OH5,OE1.2]
2.7.6.2. Pipe Sizing	
(1)	[F71,F72-OH2.1,OH2.3]
(2	[F71,F72-OH2.1,OH2.3]
2.7.6.3. Continuity of Supply and Backflow Prevention	
(1)	[F71,F72-OH2.1,OH2.3]
(2)	[F46,F81,F82-OS3.4,OH2.1,OH2.2,OH5]
2.7.6.4. Cisterns	
(1)	[F40,F81-OH2.1,OH2.3]
(2)	[F40,F81-OH2.1,OH2.3]
(3)	[F40,F81-OH2.1,OH2.3]
2.7.6.5. Water Metering	
(1)	[F130-OE1.2]
2.7.6.6. Water Quality Sampling and Alerts	
(1)	[F82-OS3.4,OH2.1,OH2.3,OH5]
(2)	[F82-OS3.4,OH2.1,OH2.3,OH5]

2.7.6.7. Power Interruption	
(1)	[F71,F72,F81-OS3.4,OH2.1,OH2.3,OH5]
2.7.7.1. Water Quality Standards, Testing, and Documentation	
(1)	[F40,F43,F71,F72,F81,F82-OS3.4,OH2.1,OH2.3,OH5]
(2)	[F40,F43,F71,F72,F81,F82-OS3.4,OH2.1,OH2.3,OH5]
(3)	[F40,F43,F71,F72,F81,F82-OS3.4,OH2.1,OH2.3,OH5]
2.7.7.2. Water Quality Reporting	
(1)	[F40,F43,F71,F72,F81,F82-OS3.4,OH2.1,OH2.3,OH5]
2.7.7.3. Required Response to Failure to Meet Water Quality Standards	
(1)	[F40,F43,F71,F72,F81,F82-OS3.4,OH2.1,OH2.3,OH5]
2.7.8.1. Operating Manual	
(1)	[F82-OS3.4,OH2.1,OH2.3,OH5,OE1.2]
2.7.8.2. Maintenance	
(1)	[F82-OS3.4,OH2.1,OH2.3,OH5,OE1.2]
(2)	[F46,F81,F82-OS3.4,OH2.1,OH2.2,OH5]
(3)	[F82-OS3.4,OH2.1,OH2.3,OH5,OE1.2]
2.7.8.3. Request for Operating Manual or Maintenance Log	
(1)	[F82-OS3.4,OH2.1,OH2.3,OH5,OE1.2]

".

37. In Book II, Division C, Council strikes out Article 1.6.3.7. and substitutes as follows:

"1.6.3.7. Authorization for Use

1) No person shall use a plumbing system or sprinkler system until it has been authorized for use by the *Chief Building Official*.".

38. In Book I, Division B, Council strikes out in Table 1.3.1.2. the By-law References for the row "ASHRAE Guideline 12-2000" and substitutes as follows:

"6.2.1.1.(1)
6.3.2.15.(11)
6.3.2.16.(1)".

39. In Book I, Division B, Council strikes out in Table 1.3.1.2. the By-law Reference "6.3.2.15.(1)" for the row "CSA CAN/CSA-Z317.2-10" and substitutes "6.3.2.15.(7)".

40. In Book I, Division B, Council adds a new row in Table 1.3.1.2. in correct alphabetical order, as follows:

"

Issuing Agency	Document Number	Title of Document	By-law Reference
ANSI/ASHRAE	188-2018	Legionellosis: Risk Management for Building Water Systems	A-6.2.1.1.

".

41. In Sentence 6.2.1.1.(1) in Book I, Division B, Council:

a) in Clause (h), strikes out "and" at the end of the Clause;
b) in Clause (i), strikes out "."" at the end of the Clause and substitutes "," and"; and
c) adds a new Clause (j) as follows:

"(j) ASHRAE Guideline 12, "Minimizing the Risk of Legionellosis Associated with Building Water Systems."".

42. In the Notes to Part 6 in Book I, Division B, Council adds the following new Note, in the correct numerical order:

"Note A-6.2.1.1. Good Engineering Practice.

Legionella Control
HVAC designers should either develop a water management plan or complete a formal risk and hazard assessment to determine what measures are required for the control of legionella. The risk and hazard assessment should include inspections of the building and its surroundings to locate potential sources of legionella and to identify equipment or systems that could promote the growth and spread of legionella. The assessment should also evaluate the risk to building occupants that is associated with any identified equipment or systems, taking into account their design, location and operating conditions.

Further information on minimizing the growth and spread of legionella can be found in the following publications:

- ANSI/ASHRAE 188-2018, "Legionellosis: Risk Management for Building Water Systems,"
- "Developing a Water Management Program to Reduce Legionella Growth & Spread in Buildings" (U.S. Centers for Disease Control and Prevention, 2017),
- "Legionella and Legionnaires' Disease: A Policy Overview" (European Agency for Safety and Health at Work, 2011),
- "Legionella and the Prevention of Legionellosis" (World Health Organization, 2007),
- "Legionnaires' Disease: Technical Guidance: Part 1: The Control of Legionella Bacteria in Evaporative Cooling Systems, and Part 3: The Control of Legionella Bacteria in Other Risk Systems" (U.K. Health and Safety Executive, 2013), and
- "Recognition, Evaluation and Control of Legionella in Building Water Systems" (American Industrial Hygiene Association, 2015).".

43. In Sentence 6.3.1.6.(1) of Book I, Division B, Council strikes out "that are released".

44. In Note A-6.3.1.6. Indoor Air Contaminants in the Notes to Part 6 in Book I, Division B, Council:

a) strikes out "cafeteria dishwasher drainage leaks,";
b) strikes out "infectious";
c) strikes out "legionnaires' disease" and substitutes "legionellosis"; and

d) adds a new item (c) to the second paragraph as follows:

"c) HVAC systems that generate condensate or introduce liquid water into the airstream in the ducts require adequate drainage of excess water and, in some cases, a means of capturing air-entrained water droplets. These measures reduce the potential for bio-contaminants, including legionella, to proliferate in stagnant water and for water droplets containing bio-contaminants to be introduced into the airstream and contaminate the indoor environment. (See also Article 6.3.2.2.)".

45. In Book I, Division B, Council strikes out Article 6.3.2.2. and substitutes the following;

"6.3.2.2. Drain Pans
(See Note A-6.3.2.2.)

1) HVAC systems that generate condensate or introduce liquid water into the airstream in the ducts shall be equipped with drain pans that are

a) designed in accordance with Section 5.10, Drain Pans, of ANSI/ASHRAE 62.1, "Ventilation for Acceptable Indoor Air Quality,"

b) provided with an outlet that is piped to the outside of the airstream in a location where condensate can be safely disposed of,

c) installed so that water does not stagnate and drains from the pan, and

d) designed and installed so as to be accessible for cleaning and maintenance.

2) Drain pans and associated piping shall be constructed of corrosion-resistant, non-porous materials that do not promote the proliferation of disease-causing micro-organisms.".

46. In the Notes to Part 6 in Book I, Division B, Council adds the following new Note, in the correct numerical order:

"Note A-6.3.2.2. Stagnant Water in Drain Pans.

It is important to eliminate stagnant water as it can promote the proliferation of disease-causing micro-organisms, such as legionella. Of particular concern is the potential for legionella bacteria in water to become airborne in water droplets or mist that can be inhaled by humans or can contaminate other water sources or systems.".

47. In Table 6.3.2.9. in Book I, Division B, Council adds "an evaporative heat rejection system such as an" before "evaporative cooling tower".

48. In Book I, Division B, Council strikes out Article 6.3.2.15. and substitutes the following:

"6.3.2.15. Evaporative Cooling Towers, Evaporative Fluid Coolers and Evaporative Condensers (Evaporative Heat Rejection Systems)
(See Article 2.2.11.6. of Division B of Book II (Plumbing Systems) of this By-law.)

1) Evaporative heat rejection systems shall

a) incorporate a drift eliminator or other means to minimize the dispersion of entrained water droplets, and

b) have a design discharge velocity that does not exceed the maximum discharge velocity recommended by the manufacturer.

2) Evaporative heat rejection systems shall be designed so that water continuously circulates through all parts of the system that are normally wetted when the system is operating.

3) Evaporative heat rejection systems and their components shall be constructed of corrosion-resistant, non-porous materials that do not promote the proliferation of disease-causing micro-organisms and that are compatible with disinfectants, biocides and other cleaning agents.

4) Evaporative heat rejection systems shall be installed such that

a) no discharge air bypasses the drift eliminator or other means referred to in Clause (1)(a), and

b) the systems are accessible for cleaning, inspection and maintenance.

5) Deleted.

6) Except as provided in Sentence (7), air discharged from evaporative heat rejection systems shall discharge away from the building, so as to not re-enter it, to a distance not less than

a) 2.15 m above sidewalks and driveways,

b) 7.6 m from outdoor air intakes,

c) 3 m horizontally or vertically from exterior doors and operable windows, and

d) 3 m horizontally or vertically from occupiable outdoor spaces, excluding maintenance spaces.

(See Note A-6.3.2.15.(6) and (7).)

7) Air discharged from evaporative heat rejection systems in health care facilities shall discharge away from the building in compliance with CAN/CSA-Z317.2, “Special Requirements for Heating, Ventilation, and Air-Conditioning (HVAC) Systems in Health Care Facilities.” (See Note A-6.3.2.15.(6) and (7).)

8) Deleted.

9) Air intakes of evaporative heat rejection systems shall incorporate protective measures to minimize the entrainment of vegetation and other organic matter.

10) Deleted.

11) Water treatment systems and equipment for controlling the proliferation of disease-causing micro-organisms shall

a) be provided in accordance with Section 7.6.2. of ASHRAE Guideline 12, “Minimizing the Risk of Legionellosis Associated with Building Water Systems,” and

b) include means for drainage, dilution, cleaning, and application of chemicals for the control of scale, corrosion and biological contamination.

(See Note A-6.3.2.15.(11).)

12) Deleted.

13) Evaporative heat rejection systems shall be provided with access openings, service platforms, fixed ladders and fall-restraint connections to allow inspection, maintenance and testing, and a sampling port shall be installed at a point in the recirculation loop just prior to the point where treatment chemicals are injected.".

49. In the Notes to Part 6 in Book I, Division B, Council adds the following new Notes, in the correct numerical order:

"Note A-6.3.2.15.(6) and (7) Minimum Distances.

Ensuring adequate distance between the air discharge locations of evaporative heat rejection systems and certain outdoor spaces and building components minimizes the potential for contamination of the air of occupiable spaces. For example, if a building's ventilation air intake were located too close to an air discharge location of an evaporative heat rejection system, warm discharge air and associated drift, which could contain biological contaminants, could be introduced to the indoor environment through the air intake.

The minimum distances stated in Sentences 6.3.2.15.(6) and (7) may need to be increased where warranted by local conditions such as prevailing winds, adjacent structures, or special processes being carried out, any of which would make further analysis necessary. (See also Sentence 6.3.3.1.(2).)

Note A-6.3.2.15.(11) Assessment of System and Make-Up Water.

The chemical characteristics of the water in the evaporative heat rejection system and of the make-up water should be assessed to select a suitable water treatment system.".

50. In Book I, Division B, Council strikes out Article 6.3.2.16. and substitutes the following;

"6.3.2.16. Evaporative Air Coolers, Misters, Atomizers, Air Washers and Humidifiers
(See Article 2.2.11.7. of Division B of Book II (Plumbing Systems) of this By-law.)

1) Evaporative air coolers, misters, atomizers, air washers and humidifiers shall be designed in accordance with Sections 8 and 9 of ASHRAE Guideline 12, "Minimizing the Risk of Legionellosis Associated with Building Water Systems."

2) Systems referred to in Sentence (1) shall
a) be designed so that water continuously circulates through all parts of the system that are normally wetted when the system is operating, and
b) incorporate a method of preventing water stagnation within the system itself and the internal plumbing when the system is not operating.
(See Note A-6.3.2.16.(2).)

3) All components of systems referred to in Sentence (1), including filters and evaporation media, shall be constructed of corrosion-resistant, non-porous materials that do not promote the proliferation of disease-causing micro-organisms.

4) Associated sumps shall
a) be constructed of corrosion-resistant, non-porous materials that do not promote the proliferation of disease-causing micro-organisms,
b) include auxiliary drains to prevent the overflow of water into ductwork, and

c) be installed so that they can be flushed, drained, cleaned and disinfected.

5) Where misters, atomizers or air washers are used in ductwork, the affected duct section shall be
a) designed to ensure drainage of unevaporated and accumulated water, and
b) constructed of corrosion-resistant, non-porous materials that do not promote the proliferation of disease-causing micro-organisms.

6) Deleted.".

51. In the Notes to Part 6 in Book I, Division B, Council adds the following new Notes, in the correct numerical order:

"Note A-6.3.2.16.(2) Prevention of Water Stagnation.
Common strategies to prevent water stagnation include flushing, providing an inactivity drain, and periodic activation even with no load.

Note A-6.3.2.16.(6) Assessment of Make-Up Water.
The chemical characteristics of the make-up water should be assessed to ensure that any chemicals added to a system referred to in Sentence 6.3.2.16.(1) for precipitation control, disinfection or another purpose will not adversely affect the system.".

52. In Book I, Division B, Table 6.10.1.1., Council

a) strikes out all of the rows for section "6.2.1.1. Good Engineering Practice", including the title, and substitutes as follows:

"

6.2.1.1. Good Engineering Practice	
(1)	(a) to (e) [F31,F51-OP1.1]
	(a) to (c) and (e) to (i) [F40,41,F50,F51,F54,F63-OH1.1]
	(a), (b), (c), (e), (f), (g), (h) [F50,F51,F52,F54,F63-OH1.2,OH1.3]
	[F31,F50,F51,F52,F54,F63-OS3.2,OS3.4]
	(d) [F01-OS-1.1]

";

b) strikes out all of the rows for section "6.3.2.2. Drain Pans", including the title, and substitutes as follows:

"

6.3.2.2. Drain Pans	
(1)	[F40,F41,F44,F50,F82-OH1.1]
(2)	[F40,F41,F44,F50-OH1.1]

";

c) strikes out all of the rows for section "6.3.2.15. Evaporative Cooling Towers, Evaporative Fluid Coolers and Evaporative Condensers", including the title, and substitutes as follows:

"

6.3.2.15. Evaporative Cooling Towers, Evaporative Fluid Coolers and Evaporative Condensers

(1)	[F40,F41,F50-OH1.1]
(2)	[F40,F41,F50-OH1.1]
(3)	[F40,F41,F50-OH1.1]
(4)	[F40,F41,F50-OH1.1]
(6)	[F40,F41,F50-OH1.1]
(9)	[F40,F41,F50-OH1.1]
(11)	[F40,F41,F50-OH1.1]
(13)	[F40,F41,F50,F82-OH1.1]
	[F82-OS3.1]

"; and

d) strikes out all of the rows for section "6.3.2.15. Evaporative Cooling Towers, Evaporative Fluid Coolers and Evaporative Condensers", including the title, and substitutes as follows:

"

6.3.2.16. Evaporative Air Coolers, Misters, Atomizers, Air Washers and Humidifiers	
(1)	[F40,F41,F50-OH1.1]
(2)	[F40,F41,F50-OH1.1]
(3)	[F40,F41,F50-OH1.1]
(4)	[F40,F41,F50-OH1.1]
	[F40,F41,F50,F82-OH1.1]
(5)	[F40,F41,F50-OH1.1]

".

53. In Sentence 2.2.11.6.(6) of Book II, Division B, Council:
    a) in Clause (c) strikes out "and" at the end of the Clause;
    b) renumbers Clause (d) as Clause (e); and
    c) inserts a new Clause (d) as follows:

    "d) at minimum, while the *cooling tower* is in operation, each calendar month of operation, with not more than 33 days between sample, and".

54. In Sentence 2.2.11.6.(7) of Book II, Division B, Council:
    a) in Clause (b) strikes out "and" at the end of the Clause;
    b) renumbers Clause (c) as Clause (d); and
    c) inserts a new Clause (c) as follows:

    "c) at minimum, while the *decorative water feature* is in operation, every 2 calendar months of operation, with not more than 63 days between samples, and".

55. In Book II, Division B, Council strikes out Article 2.7.7.1 and substitutes the following:

"2.7.7.1. Water Quality Standards, Testing, and Documentation

1) Water quality shall meet the standards set out in Table 2.7.7.1.

2) Water quality shall be tested as set out in Table 2.7.7.1.

3) All test results shall be documented as set out in Table 2.7.7.1., and documentation shall be retained for no less than 24 months.

Table 2.7.7.1.
Water Quality Standards, Testing, and Documentation
Forming Part of Sentences 2.7.7.1.(1), (2), and (3)

Applicability	Parameter	Standard	Testing Type and Frequency	Testing Result Documentation Requirement
Any non-*potable* water source	Temperature	< 20°C	Continuous	Daily(1)
Any non-*potable* water source	Turbidity	< 10 NTU	Daily(1), and 1 sample tested by a laboratory every 2 months with not more than 63 days between samples	Daily(1), plus all laboratory tests
Any non-*potable* water source	*E. coli*(2)	< 100 CFU per 100 mL or < 100 MPN per 100 mL	1 sample tested every 2 months with not more than 63 days between samples	All laboratory tests
Any non-*potable* water source	*Legionella pneumophila*(2)	< 10 CFU per mL	1 laboratory sample tested every 2 months, with not more than 63 days between samples	All laboratory tests

Notes to Table 2.7.7.1.:
(1) For the purpose of this Table, the term “daily” shall mean once per day when the *building* is normally occupied.
(2) See Article 2.2.1.7.”.

56. In Book II, Division C, Council strikes out Article 1.6.9.3. and substitutes the following:

“1.6.9.3. Application Requirements
1) To obtain an *operating permit*, the *owner* shall file an application in writing in the form prescribed by the *Chief Building Official* and be certified under the Environmental Operators Certification Program.”.

57. In Part C – Operating Permits, in the Schedule of Fees of Division C of Book II, Council strikes out:

“For each OPERATING PERMIT…….$00.00”

and substitutes:

"For the first OPERATING PERMIT relating to equipment or systems
in a BUILDING……..$250.00
For each additional OPERATING PERMIT relating to equipment or systems
in the same BUILDING…….$100.00".

58. A decision by a court that any part of this By-law is illegal, void, or unenforceable severs that part from this By-law, and is not to affect the balance of this By-law.

59. This By-law is to come into force and take effect on January 1, 2021, except that sections 53, 54, 55, 56 and 57 are to come into force and effect on January 1, 2022.

ENACTED by Council this 23rd day of June, 2020

Signed "Kennedy Stewart"
Mayor

Signed "Rosemary Hagiwara"
Acting City Clerk