

CITY OF BELLEVUE, WASHINGTON
ORDINANCE NO. 6533

AN ORDINANCE amending Chapter 23.10 to adopt Building Code local amendments; amending the Bellevue City Code, Chapter 23.30, to adopt certain State Electrical Code updates and local amendments thereto; providing for severability; and establishing an effective date.

WHEREAS, RCW 19.27.031 expressly requires the City of Bellevue to adopt state building, residential, mechanical, fire, plumbing and related uniform codes; and

WHEREAS, RCW 19.27.060 provides the City with authority to amend the codes enumerated in RCW 19.27.031 as they apply within the City's corporate boundaries, provided such modifications do not result in less than the minimum performance standards and objectives contained in the state building codes; and

WHEREAS, current provisions of the Bellevue City Code adopt and rely upon various state and national codes, which have been superseded by statewide amendments (2018 editions) that become effective February 1, 2021; and

WHEREAS, the 2018 amendments to the national codes necessitate corollary amendments to the Bellevue City Code; now, therefore,

THE CITY COUNCIL OF THE CITY OF BELLEVUE, WASHINGTON, DOES ORDAIN AS FOLLOWS:

Section 1. Section 23.10 of the Bellevue City Code is hereby amended to read as follows:

23.10.917 International Building Code Section 917 repealed – Firefighter air systems. International Building Code Section 917 is hereby repealed in its entirety.

23.10.919 International Building Code Section 919 added – Firefighter air replenishment systems. International Building Code Section 919 is hereby added to read as follows:

**SECTION 919
FIREFIGHTER AIR REPLENISHMENT SYSTEMS**

[F] 919.1 Scope. The design, installation, and maintenance of firefighter air systems shall be in accordance with this section.

[F] 919.2 Required installations. Firefighter air replenishment systems shall be installed in the following buildings and structures:

1. Buildings classified as high-rise in accordance with the International Building Code.
2. Transportation tunnels constructed in accordance with NFPA 130 or NFPA 502 that exceed 300 feet in length.
3. Underground pedestrian tunnels that exceed 300 feet in length.

[F] 919.3 Certificate of compliance

1. No certificate of occupancy shall be issued for a high-rise building or underground transportation and pedestrian tunnel unless a certificate of compliance, as described in Section 919.15.3.2, is first issued.
2. The following elements for the life safety system shall be installed in accordance with *approved* plans and specifications and shall be tested, certified and proved to be in proper working condition to the satisfaction of the *fire code official* before issuance of the certificate of compliance.

[F] 919.4 Firefighter air replenishment system. The firefighter air replenishment system is a complete, self-contained breathing air replenishment system, permanently installed within a structure, consisting of external mobile air connection panels, interior air fill stations, interconnected piping distribution system and an air storage system. All final locations shall be approved by the *fire code official*.

[F] 919.4.1 Purpose. The firefighter air replenishment system allows firefighters and other first responders to replenish empty breathing air cylinders within close proximity of the incident, reducing the amount of travel distance, time and personnel needed for logistical support, to maximize firefighter safety and effectiveness.

[F] 919.4.2 Scope. The design, installation, testing and certification of the firefighter air replenishment system shall be in accordance with this section.

[F] 919.4.3 Safety. The firefighter air replenishment system is a life-safety system. The system shall provide a safe and reliable source of clean breathable air to firefighters and other first responders performing fire suppression, evacuation, search and rescue, and other types of emergency response tasks at incidents requiring the use of self-contained breathing apparatus. Nothing within this specification shall be reduced in quality in any manner, including but not limited to system design criteria, system performance criteria, components, materials, installation procedures, testing procedures, commissioning requirements and certification.

[F] 919.4.4 Quality assurance. Plans, specifications, equipment, product data sheets, and system calculations for the firefighter air replenishment system shall be prepared, reviewed and stamped by a Washington State licensed engineer knowledgeable and qualified in high pressure breathing air replenishment systems, who can demonstrate prior experience with such systems.

[F] 919.4.5 Contractor qualifications. The firefighter air replenishment system shall be installed by a licensed Washington State contractor with a minimum 3 years of experience specializing in fire department high pressure breathing air field. The installation contractor shall have a Bellevue business license.

[F] 919.5 Performance and design criteria.

[F] 919.5.1 Safety factor. The firefighter air replenishment system shall allow firefighters to replenish a minimum of two 66 cubic foot breathing air cylinders at 5,500 PSIG simultaneously within two minutes or less. All components of the system shall be rated to operate at a minimum working pressure of 5,500 PSIG at 70°F with a minimum 4:1 safety factor.

[F] 919.5.2 Replenishment criteria. The air storage system shall be capable of replenishing not less than 50 breathing air cylinders at a rate of 2 simultaneously, each pair within 2 minutes or less (25 repetitions) without fire department supplementation, based on fire department standard breathing air cylinders of 66 cubic feet at 5,500 PSIG.

[F] 919.5.3 Design flow. The interconnected piping distribution system shall have a minimum calculated design flow using one (1) interior fill station and panel, totaling four 66 cubic foot 5,500 PSIG breathing air cylinders operating simultaneously at the farthest point from the fire department access.

[F] 919.5.4 Fire department augmentation. When air supplementation becomes available by the fire department mobile air unit, the external mobile air connection panel shall allow the mobile air unit operator to connect and begin augmentation of the system, providing for a constant source of breathing air replenishment to all interior fill stations and panels.

[F] 919.5.5 Air storage system isolation. The interconnected piping distribution system shall be designed so that the external mobile air connection panel may be isolated from the air storage system and routed directly to the interior air fill stations and panels via the system main distribution line. This shall be accomplished through the means of

check valves and actuator selector valves readily accessible by fire department personnel, to allow breathing air to be supplied directly from the fire department mobile air unit to the interior fill stations and panels.

[F] 919.6 Permits, plans and fees.

[F] 919.6.1 Permits. A permit is required to install and repair a firefighter air replenishment system.

[F] 919.6.2 Plans. Prior to the installation of a firefighter air replenishment system, plans, calculations and specifications shall be submitted to the *fire code official* for review and approval in accordance with City of Bellevue permit submittal requirements. Plans and calculations shall be stamped by a Washington State licensed engineer and shall demonstrate compliance with the requirements of this section and demonstrate that the design criteria for all pressure containing components is satisfied with a minimum working pressure of 5,500 PSIG at 70⁰F with a minimum 4:1 safety factor.

[F] 919.6.2.1 Mill reports. The plans submittal shall also include manufacturer mill report for the tubing, fittings, valves, pressure regulators, pressure relief devices, pressure gauges, cylinder filling hoses and all other components that may be required for a complete firefighter air replenishment system installation.

[F] 919.6.2.2 Additional information. The *fire code official* is authorized to require additional information that is necessary for ensuring the proposed design meets the requirements of this section.

[F] 919.6.2.3 Approval required. The installation of the firefighter air replenishment system shall not commence until complete plans, specifications and calculations have been submitted and *approved*, and a permit has been issued by the *fire code official*.

[F] 919.6.3 Fees. Fees shall be submitted to the *fire code official* at the time of plan submittal.

[F] 919.6.4 Codes and standards. The firefighter air replenishment system shall conform to all current national standards and this Section 919. Construction requirements shall follow the currently adopted editions of the IBC and IFB. Where applicable, all components of the firefighter air replenishment system shall meet the minimum requirements of the NFPA, OSHA, ASTM, ASME, ANSI and Bellevue Building, Fire, Plumbing and Mechanical codes.

[F] 919.7 System components. All pressurized breathing air components of the firefighter air replenishment system shall be listed and *approved* by a nationally recognized testing laboratory or agency. The system shall contain, at a minimum, the following components.

1. External mobile air connection panel;
2. Air storage system;
3. Air monitoring system;
4. Interior air fill station;
5. Interior air fill panel;
6. Interconnected piping distribution system; and
7. Associated wiring.

[F] 919.7.1 Protection. All components of the firefighter air replenishment system shall be protected from physical damage and the piping, storage equipment, monitoring wiring and power wiring shall be separated from the remainder of the building by not less than 2-hour *fire barriers* constructed in accordance with Section 707 or 2-hour *horizontal assemblies* constructed in accordance with Section 711, or both.

Exception: Piping, monitor wiring and power wiring located outside of a 2-hour *fire barrier* construction shall be protected using any one of the following methods:

1. Cables listed in accordance with UL 2196 having a *fire-resistance rating* of not less than 2 hours; or
2. Piping or cables encased with not less than 2 inches (51 mm) of concrete; or
3. Electrical circuit protective systems having a *fire-resistance rating* of not less than 2 hours. Electrical circuit protective systems shall be installed in accordance with their listing requirements.

[F] 919.7.2 Electrical power. The following features serving the firefighter air replenishment system shall be supplied by both primary power and *legally required standby power*:

1. Air monitoring system – Section 919.14;
2. Air storage system – Section 919.12.3; and
3. External mobile air connection panel – Section 919.8.6

[F] 919.7.3 Materials of construction. All breathing air components used in the construction of the firefighter air replenishment system shall be *listed* by a nationally recognized testing laboratory or agency and *approved* by the *fire code official*. All pressurized components shall be compatible for use with high pressure breathing air equipment and self-contained breathing air apparatus. All pressurized breathing air components shall be rated for a minimum working pressure of 5,500 PSIG at 70°F with a minimum 4:1 safety factor.

[F] 919.7.4 Markings. All components of the firefighter air replenishment system shall be clearly identified by means of stainless steel or plastic labels or tags indicating their function. This shall include as a minimum all fire department connection panels, air fill stations, air storage system, piping, gauges, valves, air connections, air outlets, enclosures, and doors.

[F] 919.8 External mobile air connection and enclosure.

[F] 919.8.1 Location. A minimum of two external mobile air connection panels shall be attached to the building or on a remote monument at the exterior of the building and shall be interconnected to the air monitoring system, air storage system, air fill stations and air fill panels. The external mobile air connection panels shall be secured inside of a weather resistant NEMA 4 enclosure. The panels shall be within 50 feet of an *approved* roadway or driveway, or other location *approved* by the *fire code official*. The enclosures shall be visible and accessible on approach to the building and shall be maintained with a minimum of 6 feet clear distance that provides a 180-degree clear unobstructed access to the front of the panels.

EXCEPTION: When the *fire code official* determines that it is impractical to provide two panels, only one external mobile air connection panel will be required.

[F] 919.8.2 Purpose. The external mobile air connection panel shall provide the fire department mobile air operator access to the firefighter air replenishment system and shall be compatible with the fire department mobile air unit.

[F] 919.8.3 Non-metallic materials. When the enclosures are constructed of non-metallic materials, the enclosures shall be resistant to ultraviolet and infrared solar radiation.

[F] 919.8.4 Vehicle protection. When the panels are located in an area subject to vehicle traffic, impact protection shall be provided in accordance with *International Fire Code* Section 312.

[F] 919.8.5 Enclosure marking. The front of the enclosures shall be marked FIREFIGHTER AIR REPLENISHMENT SYSTEM on a securely attached stainless steel engraved, plastic engraved, or painted plate. The lettering shall be in a color that contrasts with the enclosure front and in letters that are a minimum of 2-inches high with 3/8-inch brush stroke. The marking of the enclosures shall be immediately visible and accessible to emergency response personnel.

[F] 919.8.6 Enclosure components. The external mobile air connection panel shall contain all of the necessary gauges, isolation valves, pressure relief valves, pressure regulating valves, check valves, tubing, fittings, supports, connectors, adapters, air monitoring displays, tamper devices, storage bypass and other necessary components as may be required to allow the fire department mobile air unit to connect and augment the system with a constant source of breathing air.

[F] 919.8.7 Fire department key box. A fire department key box shall be provided adjacent to the external mobile air connection panel and enclosure. A key for the enclosure shall be provided in the key box.

Exception: Subject to the approval of the *fire code official*, the key may be located in a fire department key box that also provides access keys for entry into the building, when it is nearby, the key is clearly marked, and there is sufficient room in the fire department key box.

[F] 919.9 Interior air fill station and air fill panel.

[F] 919.9.1 Location. Air fill stations shall be installed within buildings and structures as follows:

[F] 919.9.2 Above grade structure. An air fill station and enclosure shall be installed on the fifth floor above grade and every third floor thereafter. The air fill station shall be located at an *approved* location between the fire service access elevator and an *approved* enclosed *interior exit stairway*. Features of the approved stairway shall include access to all above grade floor levels of the building and proximity to the fire service access elevator. The specific location on the floors shall be *approved* by the *fire code official*. The location of air fill stations in buildings not equipped with fire service access elevators shall be *approved* by the *fire code official*.

[F] 919.9.3 Underground structure. An interior air fill panel shall be located in all required *interior exit stairways* on the floor landing commencing at the second level below grade and every other level below grade thereafter. The panel shall be located a minimum of 36 inches, but not more than 60 inches above finished floor or stair landing.

[F] 919.9.4 Transportation and pedestrian tunnels. An interior air fill panel shall be located within 200 feet of the tunnel entrance and at intervals not exceeding 400 feet thereafter as approved by the fire code official. The panel shall be located a minimum of 36 inches, but not more than 60 inches above finished floor or stair landing.

[F] 919.9.5 Purpose. Air fill stations shall provide firefighters and other first responders the ability to safely and reliably replenish empty breathing air cylinders.

[F] 919.9.6 Performance. Air fill stations shall be capable of replenishing a minimum of two 66 cubic foot, 5,500 PSIG breathing air cylinders at 25 percent capacity within two minutes or less and shall provide for the refilling of breathing air cylinders within a certified rupture-proof fill containment enclosure. The design of the air fill station shall provide for the direct refilling of firefighter breathing air cylinders by means of a discharge outlet with a minimum of one cylinder filling hose that shall have a female quick connect (UAC). The female UAC shall be designed to connect to a male UAC. The assembled UAC shall meet the construction, performance and dimensional requirements of NFPA 1981, *Standard on Open Circuit Self-Contained Apparatus for Fire and Emergency Services*.

[F] 919.9.7 Enclosure requirements. Each air fill station shall be installed within a lockable enclosure (closet or room) by a means *approved* by the *fire code official*. Each enclosure shall be located between the fire service access elevator and an *approved* enclosed *interior exit stairway*. Features of the *approved* stairway shall include access to all above-grade floor levels of the building and proximity to the fire service access elevator.

The door to each enclosure shall be readily visible from the entrance to the *interior exit stairway* and readily accessible at all times by firefighters and other emergency responders and shall be maintained with a minimum of six (6) feet clear distance for a 180-degree clear unobstructed access to the front of the air fill station. The enclosure shall have emergency illumination and at least one 120-volt AC duplex grounded receptacle supplied from the building *emergency power system*.

[F] 919.9.8 Security. To prevent unauthorized access to or tampering with the system, each air fill station enclosure shall be maintained locked by a means *approved* by the *fire code official*.

[F] 919.10 Markings.

[F] 919.10.1 Enclosure. Each air fill station enclosure shall be marked FIREFIGHTER AIR REPLENISHMENT SYSTEM on a securely fastened stainless steel engraved, plastic engraved or painted plate. The lettering shall be in a color that contrasts with the cabinet front and in letters that are a minimum of 2-inches high with 3/8-inch brush stroke. The marking of the cabinet shall be immediately visible and accessible to emergency response personnel.

[F] 919.10.2 Stairway. Immediately above stairway signage required by *International Fire Code* Section 1023.9, a sign as described in 919.10.1 shall be posted at every door on floors equipped with air fill stations.

[F] 919.10.3 Air fill station marking. The front of each air fill station shall be marked FIREFIGHTER AIR REPLENISHMENT SYSTEM on a securely fastened stainless steel engraved, plastic engraved or painted plate. The lettering shall be in a color that contrasts with the cabinet front and in letters that are a minimum of 2-inches high with 3/8-inch brush stroke. The marking of the cabinet shall be immediately visible and accessible to emergency response personnel.

[F] 919.11 Air fill station components. The air fill station shall contain all of the necessary gauges, isolation valves, pressure relief valves, pressure regulating valves, check valves, tubing, fittings, supports, connectors, adapters and other necessary components as may be required to allow firefighters and other first responders to safely and reliably replenish a minimum of two breathing air cylinders within a certified rupture-proof fill containment enclosure and an emergency connect directly to firefighter self-contained breathing apparatus equipment by means of quick fill adapters, hose and UAC fittings.

[F] 919.11.1 Purpose. Air fill panels shall provide firefighters and other first responders the ability to safely and reliably replenish empty breathing air cylinders during an emergency incident.

[F] 919.11.2 Performance. Air fill panels shall be capable of replenishing a minimum of two 66 cubic foot, 5,500 PSIG breathing air cylinders at 25 percent capacity within two minutes or less and shall provide for the direct refilling of firefighter breathing air cylinders by means of a discharge outlet with a minimum of two cylinder filling hoses that shall have a female quick connect (UAC). The female UAC

shall be designed to connect to a male UAC. The assembled UAC shall meet the construction, performance and dimensional requirements of NFPA 1981, *Standard on Open Circuit Self-Contained Apparatus for Fire and Emergency Services*.

[F] 919.11.3 Enclosure requirements. Each air fill panel shall be in a cabinet constructed of minimum 18-gauge carbon steel. The depth of the cabinet shall not create an exit obstruction when installed in building stairways. All components, except the control valve, pressure gauges, fill hoses and ancillary components, shall be contained behind a minimum 18-gauge carbon steel interior panel.

[F] 919.11.4 Cylinder filling hose. The design of the cabinet shall provide a means for storing the hose to prevent kinking. The brackets shall be installed so that the hose bend radius is maintained at 4 inches (102 mm) or greater when the hose is coiled. The discharge outlet of each cylinder filling hose shall have a female Rapid Intervention Crew Universal Air Coupling (RIC/UAC). The female fitting shall be designed to connect to a male RIC/UAC. The assembled RIC/UAC shall meet the construction, performance and dimensional requirements of NFPA 1981, *Standard on Open Breathing Circuit Self-Contained Breathing Apparatus for Fire and Emergency Services*.

[F] 919.11.5 Door. Hinges for the cabinet door shall be located inside of the cabinet. The door shall be arranged such that when the door is open, it does not reduce the required exit width or create an obstruction in the path of egress. A minimum of 20 percent of the door surface area shall be a relite constructed of tempered glass. The thickness of the glass shall not be greater than 1/8 inch.

[F] 919.11.6 Security. To prevent unauthorized access to or tampering with the system, each air fill panel enclosure shall be maintained locked by a means *approved* by the *fire code official*.

[F] 919.11.7 Cabinet marking. The front of each panel shall be marked FIREFIGHTER AIR REPLENISHMENT SYSTEM on a securely fastened stainless steel engraved, plastic engraved or painted plate. The lettering shall be in a color that contrasts with the cabinet front and in letters that are a minimum of 2-inches high with 3/8-inch brush stroke. The marking of the cabinet shall be immediately visible and accessible to emergency response personnel.

[F] 919.11.8 Air fill panel components. The air fill panel shall contain all of the necessary gauges, isolation valves, pressure relief valves, pressure regulating valves, check valves, tubing, fittings, supports, connectors, adapters and other necessary components as may be required to allow firefighters and other first responders to

safely and reliably replenish a minimum of 2 breathing air cylinders connecting directly to firefighter self-contained breathing apparatus equipment by means of quick fill adapters, hose and RIC/UAC fittings.

[F] 919.12 Air storage system.

[F] 919.12.1 Location. An air storage system shall be installed in buildings and structures at locations approved by the *fire code official*.

[F] 919.12.2 Purpose. The air storage system along with interior air fill stations and air fill panels shall provide firefighters and other first responders the ability to safely and reliably replenish empty breathing air cylinders prior to the fire department mobile air unit arriving on scene.

[F] 919.12.3 Performance. The air storage system shall be capable of replenishing not less than 50 breathing air cylinders at a rate of 2 simultaneously, each pair within 2 minutes or less (25 repetitions) without fire department supplementation. The breathing air cylinders are fire department standard 66 cubic feet at 5,500 PSIG.

[F] 919.12.4 Enclosure requirements. The air storage system shall be contained within an enclosure (closet or room) which shall be separated from the remainder of the building by not less than 2-hour fire barriers constructed in accordance with Section 707 or 2-hour horizontal assemblies constructed in accordance with Section 711, or both. The enclosure shall be sufficiently sized to accommodate all air storage system components. The access door to the enclosure shall be of sufficient size to allow for the maintenance and removal of the air storage system. The enclosure shall be conditioned so that the temperature is no less than 40⁰F or more than 80⁰F and shall have an engineered pressure relief vent for over-pressurization in the event of component failure. The enclosure shall have emergency illumination and at least one 120-volt AC duplex grounded receptacle supplied from the building *emergency power system*.

[F] 919.12.5 Security. To prevent unauthorized access to or tampering with the air storage system, the enclosure shall be maintained locked by a means *approved* by the *fire code official*.

[F] 919.12.6 Enclosure marking. The air storage enclosure shall be marked FIREFIGHTER AIR REPLENISHMENT SYSTEM on a securely fastened stainless steel engraved, plastic engraved or painted plate. The lettering shall be in a color that contrasts with the cabinet front and in letters that are a minimum of 2-inches high with 3/8-inch brush stroke. The marking of the enclosure shall be immediately visible and accessible to emergency response personnel.

[F] 919.12.7 Air storage system marking. The air storage system shall be marked FIREFIGHTER AIR REPLENISHMENT SYSTEM on securely fastened stainless steel engraved, plastic engraved or painted plates. The lettering shall be in a color that contrasts with the system components and in letters that are a minimum of 2-inches high with 3/8-inch brush stroke.

[F] 919.13 Piping, distribution materials and methods.

[F] 919.13.1 Prohibition. The use of carbon steel, iron pipe, malleable iron, high-strength gray iron, alloy steel, copper or plastic for pressurized breathing air components is prohibited.

[F] 919.13.2 Materials of construction. All components of the piping distribution system shall be protected from physical damage and shall be separated from the remainder of the building by not less than 2-hour fire barriers constructed in accordance with Section 707 or 2-hour horizontal assemblies constructed in accordance with Section 711, or both. All pressurized materials used in the construction of the piping distribution system shall be compatible for use with high pressure breathing air equipment and self-contained breathing apparatus. All pressurized breathing air components shall be rated for a minimum working pressure of 5,500 PSIG at 70°F with a minimum 4:1 safety factor. The internal surfaces of all pressurized material shall be free of contamination.

[F] 919.13.3 Tubing. Tubing shall be constructed of stainless-steel materials that are compatible with high pressure breathing air. When stainless steel tubing is used, it shall meet ASTM A-269, Grade 316 or an equal standard. Stainless steel tubing shall be a minimum .375 outside diameter x .065 wall 316 fully annealed seamless. Stainless steel tubing shall be at least Grade 316 and meet the requirements of ASTM A-479 or equal. Routing of tubing and bends shall be such as to protect the tubing from mechanical damage.

[F] 919.13.4 Securement. Tubing shall be supported at a maximum of five-foot intervals. Individual tubing clamps and mounting components shall be mechanically secured to the building structural support members in accordance with the manufacturer's specifications and the applicable Bellevue Plumbing and Mechanical codes.

[F] 919.13.5 Marking. All tubing shall be clearly marked FIREFIGHTER AIR REPLENISHMENT SYSTEM and HIGH-PRESSURE BREATHING AIR using double-sided engraved 3-inch x 1-inch stainless steel or plastic markers placed at a minimum of 10-foot intervals and at each floor level whether concealed or not.

[F] 919.13.6 Fittings. Fittings shall be constructed of stainless-steel materials that are compatible with high-pressure breathing air. Stainless steel fittings shall be at least Grade 316 and meet the requirements of ASTM A-479 or an equal standard and rated to the maximum working pressure of the tubing used.

[F] 919.13.7 System assembly requirements. The piping distribution system shall be a welded system, except where the tubing joints are readily accessible and at the point of connection to the individual air fill stations. Welding procedures shall follow nationally recognized standards. Prior to and during the welding of sections of tubing, a continuous, regulated argon purge at 3 PSIG shall be maintained to eliminate contamination with products of the oxidation or welding flux. The purge shall commence a minimum of 2 minutes prior to welding operations and continue until the welded joint is at ambient temperature of 72⁰F. When mechanical high-pressure tube fittings are used, they shall be listed for the type of materials to be joined and rated for the maximum pressure of the system. When mechanical tube fittings are used, prior approval by the *fire code official* must be obtained. All concealed mechanical fittings for tubing and valves shall be made accessible by means of a 90-minute *fire-resistance-rated, self-closing, fire door* with a fire department *approved* locking system. All concealed mechanical fittings for tubing and valves shall be readily accessible by means of a 90-minute *fire-resistance-rated, self-closing, self-latching fire door*. Each *fire door* shall be provided with a fire department *approved* locking system. Where tubing passes through *fire-resistance-rated* construction, it shall be protected by a sleeve at least three times the tube diameter. Penetrations of *fire-resistance-rated* assemblies shall comply with *International Building Code* Section 714.

[F] 919.13.8 Prevention of contamination. The installing contractor shall ensure that, at all times, the system components are not exposed to contaminants, including but not limited to, oils, solvents, dirt and construction materials. When known or suspected contamination of system components has occurred, the affected component shall not be installed in the system. The installation shall also conform to engineering standard of care.

[F] 919.14 Air monitoring system. An *approved* air monitoring system shall be provided. The system shall automatically monitor air quality, moisture and pressure on a continual basis. The air monitoring system shall be equipped with not less than two content analyzers capable of detecting carbon monoxide, carbon dioxide, nitrogen, oxygen, moisture and hydrocarbons. The air monitoring system shall be connected to the building fire alarm system as a supervisory alarm. The air monitoring system shall transmit a supervisory signal when any of the following levels are detected:

1. Carbon monoxide exceeds 5 ppm;
2. Carbon dioxide exceeds 1,000 ppm;
3. An oxygen level below 19.5 percent or above 23.5 percent;
4. A nitrogen level below 75 percent or above 81 percent;
5. Hydrocarbon (condensed) content exceeds 5 milligrams per cubic meter of air;
6. The moisture concentration exceeds 24 ppm by volume; or
7. The pressure falls below 4,950 PSIG at 70°F

The air quality and pressure status shall be displayed at the fire command center, within the exterior mobile air connection panel and at the air storage system. The building owner or authorized agent shall notify the fire department and testing contractor of any alarm signaling a rise in moisture or carbon monoxide levels within the system.

[F] 919.15 Final testing, inspection and commissioning.

[F] 919.15.1 All components of the firefighter air replenishment system shall be pre-inspected and tested for proper assembly and operation prior to a functional fire department test and inspection.

[F] 919.15.2 Testing procedures.

[F] 919.15.2.1 Pneumatic testing. Following fabrication, assembly, and installation of the piping distribution system, exterior connection panel and interior cylinder fill panels, the *fire code official* shall witness the pneumatic testing of the complete system at a minimum test pressure of 6,050 PSIG using oil-free dry air, nitrogen or argon. A minimum 24-hour pneumatic test shall be performed. During this test all fittings, joints and system components shall be inspected for leaks. A solution compatible with the system component materials shall be used on each joint and fitting to detect any leaks. Any system defects or detected leaks shall be documented on an inspection report and either repaired or replaced.

As an alternate, a pressure decay test in accordance with ASME B31.3 is allowed. A test of the low-pressure monitoring switch shall be performed. Each air fill panel shall be tested for compatibility with the fire department self-contained breathing apparatus (SCBA) RIC/UAC. The pipe or tubing manufacturer mill report shall be provided to the *fire code official*.

[F] 919.15.2.2 Low pressure monitor calibration. Upon the successful completion of the twenty-four-hour pressure test, the system low pressure monitor shall be calibrated to not less than 4,950

PSIG descending and tested to verify that the signal is annunciated at the building main fire alarm panel.

[F] 919.15.2.3 Grade D breathing air verification. A minimum of two air samples shall be taken from separate air fill stations and submitted to an independent certified gas analyst laboratory to verify the system cleanliness and that the air meets all applicable standards for breathing air systems to include, but not limited to 1) NFPA 1500; 2) NFPA 1989 Standard on Breathing Air Quality for Emergency Services Respiratory Protection; and 3) OSHA Standard 29 CFR 1910.134(i)(1) – Grade D Breathing Air.

The laboratory shall submit a written report to the testing contractor and the *fire code official* documenting the air analysis complies with the above requirements.

[F] 919.15.2.4 Air fill station inlets secured during testing. During the period of air quality analysis, the air fill station inlets shall be secured so that no air can be introduced into the system and each air fill station shall be provided with a sign stating, "AIR QUALITY ANALYSIS IN PROGRESS, DO NOT FILL OR USE ANY AIR FROM THIS SYSTEM." This sign shall be a minimum of 8-1/2 X 11 inch with a minimum of 1-inch lettering.

[F] 919.15.2.5 Mobile air unit compatibility verification. Each external mobile air connection panel shall be tested for compatibility with the fire department mobile air unit.

[F] 919.15.2.6 SCBA compatibility verification. Each air fill station and air fill panel shall be tested for compatibility with the fire department self-contained breathing cylinders and apparatus.

[F] 919.15.2.7 Performance criteria verification. The air storage system shall be tested for its ability to meet the performance criteria outlined in section 919.12.3.

[F] 919.15.2.8 Air monitoring system testing. The air monitoring system shall be tested for the capability to meet the requirements of this section.

[F] 919.15.2.9 Commissioning closeout. Upon successful completion of all testing procedures, the system shall be filled to normal operating pressure of 5,500 PSIG, all control valves shall be placed in their normal operating position, and all doors shall be secured and locked. Five sets of keys properly identified shall be provided to the fire department.

[F] 919.15.3 System acceptance and final commissioning.

[F] 919.15.3.1 Training. The installing contractor shall provide training for the fire department upon the successful completion of all inspections, testing and commissioning procedures. The training shall be accomplished in three separate shifts of not more than three hours per session. The fire department may request additional training when the regular testing and certification contractor performs testing and certification procedures. Training sessions shall be by mutual consent with the building owner or authorized agent.

Exception: This requirement shall be waived when five projects with firefighter air replenishment systems have received a certificate of occupancy provided that subsequent installations have not been granted approval under an *Alternative Materials, Design and Methods of Construction and Equipment*.

[F] 919.15.3.2 Certification. A certificate documenting that the entire firefighter air replenishment system has been installed, tested and commissioned in accordance with this Section 919 and the *approved* plans shall be stamped by a Washington State licensed engineer and submitted to the *fire code official*.

[F] 919.15.3.3 Final acceptance. Prior to the final acceptance of the firefighter air replenishment system and issuance of the certificate of occupancy, the building owner or authorized agent shall provide for the regular testing and certification of the firefighter air replenishment system. Written verification of regular testing and certification shall be provided to the fire department.

[F] 919.15.3.4 Regular testing and certification. The firefighter air replenishment system shall be continuously maintained in an operative condition and shall be inspected not less than annually. This shall include verifying the system compatibility with the fire department mobile air unit and self-contained breathing apparatus, and shall include verifying the system ability to maintain 5,500 PSIG working pressure at 70⁰F with a 4:1 safety factor, the operability of the low-pressure monitor, air monitoring system and the system ability to comply with the air quality requirements of this section. The building owner, authorized agent or testing contractor shall notify the fire department of any scheduled test of the system. On a quarterly basis two air samples shall be taken from two separate air fill stations and tested to verify compliance with NFPA 1989. The laboratory test results shall be maintained on site and readily available for review by the fire department.

Point of Information

Annual test reports shall be submitted online via www.TheComplianceEngine.com within 5 business days after completing the test.

[F] 919.15.3.5 Final commissioning. Upon satisfactory completion of all testing procedures, receipt of the Washington State licensed engineer's stamped certification, verification of a regular testing and maintenance contract, and fire department training (unless waived by the fire department), the system shall be considered complete. The firefighter air replenishment system shall then be considered ready for use by firefighters and other first responders in an emergency incident.

[F] 919.16 Special requirements. Any modification or changes to components contained within or to the "systems" described in this section shall be requested through the *fire code official* and *approved* in writing. This condition does not prohibit emergency repairs; however, a written report of the emergency repairs and testing is required to be submitted by the testing and certification contractor.

Section 2. Chapter 23.30 of the Bellevue City Code is hereby amended to read as follows:

Chapter 23.30 ELECTRICAL CODE

Sections:

23.30.015 Washington Cities Electrical Code adopted.
23.30.450.14 Bellevue City Code Section 23.30.450.14 amended –
Disconnecting Means.

23.30.015 Washington Cities Electrical Code adopted. The 2020 Edition of the *Washington Cities Electrical Code*, Part 1 and Part 3, but excluding Part 2, Administration, as published by the Washington Association of Building Officials is adopted and shall be applicable within the City, as amended, added to, and excepted in this chapter.

23.30.450.14 Bellevue City Code Section 23.30.450.14 amended – Disconnecting Means. Washington Cities Electrical Code Section 450.14 is hereby amended to read as follows:

450.14 Disconnecting Means. Transformers, other than Class 2 or Class 3 transformers, shall have a disconnecting means located either in sight of the transformer or in a remote location. Where located in a remote location, the disconnecting means shall be lockable open in accordance with 110.25 and its location shall be field

marked on the transformer. Transformers shall not be located more than one story above *grade plane* (as defined in the *International Building Code*) unless protected by NEC compliant disconnect and overcurrent protection.

Exception: Where approved by the *building official* and the *fire code official*.

Section 3. Severability. If any section, subsection, paragraph, sentence, clause, or phrase of this Ordinance is declared unconstitutional or invalid for any reason, such decision shall not affect the validity of the remaining parts of this Ordinance.

Section 4. This Ordinance shall take effect and be in force on October 29, 2020.

Passed by the City Council this 12th day of OCTOBER, 2020
and signed in authentication of its passage this 12th day of OCTOBER,
2020.

(SEAL)



Lynne Robinson, Mayor

Approved as to form:
Kathryn L. Gerla, City Attorney

Matt McFarland, Assistant City Attorney

Attest:

Charmaine Arredondo, City Clerk

Published: 10/15/20