CITY OF BELLEVUE, WASHINGTON

ORDINANCE NO. 6534

AN ORDINANCE amending Ordinance 6292 and Chapter 23.11 of the City of Bellevue Fire Code; repealing and replacing sections 23.11.113 and 23.11.510; repealing section 23.11.917; adding new sections 23.11.607.9 and 23.11.919; providing for severability; and establishing an effective date.

WHEREAS, RCW 19.27.031 expressly requires the City of Bellevue 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 uniform codes; and

WHEREAS, amendment of the current fire code is necessary in order to allow building owners to plan for upgrades to the Puget Sound Emergency Public Radio System, address firefighter air replenishment systems, and clarify elevator maintenance obligations for the health and safety of building occupants; therefore

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

SECTION 1. Bellevue City Code section 23.11.113 of Ordinance 6292 is hereby repealed and replaced to hereafter read as follows:

23.11.113 International Fire Code Section 106 amended – Fees.

Section 113 of the International Fire Code is hereby amended to read as follows:

113 Fees. A permit shall not be issued until the fees have been paid, nor shall an amendment to a permit be released until the additional fee, if any, has been paid.

113.2 Schedule of permit fees. A fee for each permit shall be paid as required, in accordance with Table 113.

These fees shall be reviewed annually, and, effective January 1 of each year, administratively increased or decreased to the nearest whole dollar by an adjustment to reflect the current published annual change in the Seattle Consumer Price Index for Wage Earners and Clerical Workers – June to June timeframe. This does not apply to the Inspection Fee (23.11.113) which is to be reviewed and adjusted by City Council every two years.

A fee schedule (Fire Prevention Fee Schedule) reflecting the base fees in Table 113 and any applicable administrative adjustment pursuant to this section will be made available to the public.

113.3 Work commencing before permit issuance. Any person who commences any work, activity or operation regulated by this code before obtaining the necessary permits shall reimburse the City for all expenses related to any enforcement proceedings and be subject to a penalty levied in an amount up to double the fee required for the work, activity or operation commenced prior to obtaining the necessary permits which shall be in addition to the required permit fees.

This provision does not apply to emergency work, activity or operations when it is proved to the satisfaction of the Fire Marshal that such work, activity or operation was urgently necessary and that it was not practical to obtain a permit before commencement of the work, activity or operation.

In all such cases, a permit must be obtained as soon as it is practical to do so; and if there is an unreasonable delay in obtaining the permit, a double fee (as provided for in this ordinance) will be charged. The payment of this double fee does not relieve any person from fully complying with the requirements of the Bellevue City Code in the execution of the work or from any other penalties prescribed by law. Such person may also be required to reimburse the City for all expenses related to any enforcement proceedings as determined by the Fire Marshal.

113.4 Related fees. The payment of the fee for the construction, alteration, removal or demolition of work done in connection to or concurrently with the work or activity authorized by a permit shall not relieve the applicant or holder of the permit from the payment of other fees that are prescribed by law.

113.5 Refunds. The applicable governing authority is authorized to establish a refund policy.

113.6.1 Operational permit fees. A base fee of $127.00, subject to adjustment as specified in BCC 23.11.113.2 shall be charged annually for each type of operational permit (as defined in International Fire Code Section 105.6).

Exceptions:

1. Tenants requiring multiple operational permits in the same building shall be charged only one permit fee per calendar year.

2. No fees shall be charged for candles in a place of assembly or parade floats.

3. Fees shall be waived for:

1. Government agencies
2. Non-profit organizations exempt from federal income tax under Section 501(c)(3) of the Internal Revenue Code.

113.6.2 Pyrotechnical effects permits. A base fee of $232.00, subject to adjustment as specified in BCC 23.11.113 shall be charged for pyrotechnical effects permits.

113.6.3 Construction permit fees. The fee for each permit shall be as set forth in the fee ordinance, as now or hereafter amended.

113.6.4 Re-inspection fee. A re-inspection fee may be assessed when all of the following criteria have been met:

- Code violations have been identified by the *fire code official*.
- A written notice has been issued to the responsible party, identifying the code violations and a time period to make corrections.
- The code violations have not been corrected within the specified period.

The fee shall be $173.00/hour, subject to adjustment as specified in BCC 23.11.113 with a one hour minimum.

113.6.5 Event Fee. When the fire chief determines it is necessary to preserve the public health, safety and welfare, event sponsors may be required to compensate the department for staffing and equipment in an amount calculated according to the Washington State Fire Chiefs Association's fee schedule together with Fire Prevention hourly staffing rate as published in Development Services Fee Ordinance 6263 or as amended.

113.6.6 Confidence Test Report Filing Fee. Effective January 1, 2017 confidence test reports must be filed with "The Compliance Engine" (www.thecomplianceengine.com). A $25.00 filing fee remitted to Brycer L.L.C is required at the time of filing. Brycer L.L.C will retain $10.00 and 6% of the total filing fee and return the balance to the City of Bellevue to partially offset an incremental increase in staffing required to fully implement this program.

106.6.6.1 Late Report Filing Fee. Confidence test reports that are not filed within five business days of the inspection or maintenance completion are subject to an additional $10.00 fee in accordance with BCC 23.11.108.3.1

106.6.7 Insufficient Funds. Any applicant whose payment of fees is returned to the City for Non-Sufficient Funds, or whose credit card payment is denied, will be charged the City standard insufficient funds fee. The original fees and the returned check fee are due and payable within five (5) working days of notification.

113.6.7 Late Fee. All balances 30 days or greater past the invoice date are assessed a late charge of 1%, with a minimum charge of $25 per month.

113.6.8 Inspection fee. The fire chief, or their designee, is authorized to assess a fire inspection fee for inspections made of commercial and multifamily buildings under International Fire Code Chapter 1, Section 104. The fire inspection fee shall be assessed at the time the inspection is made. The fire chief or their designee shall calculate the inspection fee based on the following formula for each building or occupancy:

(Square Foot Factor)* multiplied by (Occupancy Factor)** multiplied by (Base Rate)*** = Inspection Fee

The Square Foot Factor and Occupancy Factor shall be determined by the fire chief, or their designee performing the inspection. The Base Rate shall be set by city council.

113.6.8.1 Square Foot Factor. The *Square Foot Factor shall be determined as follows:

#0 = Under 1,000 Sq. Ft.
#1 = 1,000 Sq. Ft. or larger up to;
#2 = 3,000 Sq. Ft. or larger up to;
#3 = 10,000 Sq. Ft. or larger up to;
#4 = 40,000 Sq. Ft. or larger up to;
#5 = 80,000 Sq. Ft. or larger up to;
#6 = 100,000 Sq. Ft. or larger.

113.6.8.1.1 Covered Mall Buildings. The square footage for *Covered Mall Buildings* shall not include *anchor buildings,* which will be assessed separately*. For Covered Mall Building* 500,000 sq. ft or larger the square footage factor shall be as follows:

#7= 500,000 Sq. Ft. or larger up to;
#8 = 750,000 Sq. Ft. or larger up to;
#9 = 1,000,000 Sq. Ft. or larger.

113.6.8.2 Occupancy Factor. The ** Occupancy Factor shall be determined as follows:

.1 *Group R* Townhomes & single-story *Group S* self-storage warehouses.

.3 Group R Buildings not exceeding 3 stories in height; Group S Self-storage warehouses not exceeding 3 stories in height; Group S stand-alone parking garages and covered boat moorage.

1.0 All buildings or portions of buildings classified as Group A Division 3, B, M, R (not to include Group R Division 3) and U occupancies.

2.0 All buildings or portions of buildings classified as Group A Division 1, 2 and 4, E, S or LC occupancies.

3.0 All buildings classified as high-rise buildings; all covered mall buildings not to include anchor buildings; all buildings or portions of buildings classified as Group F, H or I occupancies.

113.6.8.2.1 High-Rise Buildings with common podiums. When multiple High-Rise buildings are located above a common podium, the associated parking garage and podium areas shall be assigned an occupancy factor of 2 and treated as one building.

113.8.2.2 Mixed Occupancy Buildings. All occupancy classifications are in accordance with the International Building Code (IBC) as amended by Chapter 51-50 WAC. Mixed occupancy buildings shall be classified for the purpose of the occupancy factor based upon the predominate occupancy of the building by square footage.

113.6.8.3 Base Rate. *** Base Rate = $180.00 commencing January 1, 2020.

113.6.9 Maximum Fee. Where multiple buildings have a single owner and comprise a single complex, the maximum fee for a single complex containing *Group E or R occupancies* that do not exceed 4 stories in height shall be $3,240.00

113.6.10 Exemptions from inspection fee. Buildings owned by nonprofit organizations exempt from federal income tax under Section 501(c)(3) of the Internal Revenue Code, buildings owned by the federal government, and buildings less than 1,000 square feet are exempt from the fire inspection fees established in BCC 23.11.113.6.8. This exemption does not apply to nonprofit organizations when a majority of the building is occupied by tenants not exempt from federal income tax under Section 501 (c)(3).

113.6.11 Reinspection and special inspections. The fire inspection fee shall cover the initial inspection and one follow-up visit, if necessary, to determine correction of any violations. Any additional follow-up inspections necessitated by noncompliance or inspections for which no fee is specifically indicated, shall be assessed a fee at the time of the inspection and at the rates established in BCC 23.11.113.6.4.

113.6.12 Adjustment to base rate. The base rate used in BCC 23.11.113.6.8.3 shall be set by city council and reviewed in 2020 and every two years thereafter, or as otherwise necessary, to accomplish cost recovery for the fire inspection program. The base rate shall be adjusted to account for inflation, additional commercial and multifamily square footage subject to fire inspection which has been added within the

city, and additional fire inspection resources or personnel necessary to perform fire inspections on a regular basis.

113.6.13 Inspection fee – Payment obligation. The obligation to pay the fee assessed pursuant to BCC 23.11.113.6.8 or 23.11.113.6.11 shall be the responsibility of the building or complex owner.

113.6.14 Inspection fee – Collection procedure. The fees established in BCC 23.11.113.6.9 and 23.11.113.6.12 shall be billed to the party responsible. All balances 30 days or greater past the date of original assessment shall incur late charges pursuant to BCC 23.11.113.6.8.The director of finance and asset management, or their designee, may use any lawful means to collect the balance or write off the obligation.

SECTION 2. Bellevue City Code section 23.11.510 of Ordinance 6292 is hereby repealed and replaced to hereafter read as follows:

23.11.510 International Fire Code Section 510 amended – Emergency Responder Radio Coverage.

Section 510 of the International Fire Code is hereby amended to read as follows:

510.1 Emergency responder radio coverage in new buildings. *Approved* radio coverage for emergency responders shall be provided within buildings that meet any one of the following conditions:

1. High rise buildings;
2. The total building area is 50,000 square feet or more;
3. The total basement area is 10,000 square feet or more;
4. There are floors used for human occupancy more than 30 feet below the finished floor of the lowest level of exit discharge; or
5. Buildings or structures where the Fire or Police Chief determines that in-building radio coverage is critical because of its unique design, location, use or occupancy.

The radio coverage system shall be installed in accordance with Sections 510.4 through 510.5.5 of this code and with the provisions of NFPA 1221 (2019). This section shall not require improvement of the existing public safety communication systems.

Point of Information

When determining if the minimum signal strength referenced 510.4.1.1 exists at a subject building, the signal strength shall be measured at any point on the exterior of the building up to the highest point on the roof.

Exceptions:

1. Buildings and areas of buildings that have minimum radio coverage signal strength levels of the King County Regional 800 MHz Radio System within the building in accordance with Section 510.4.1 without the use of a radio coverage system.

2. In facilities where emergency responder radio coverage is required and such systems, components or equipment required could have a negative impact on the normal operations of that facility, the *fire code official* shall have the authority to accept an automatically activated emergency responder radio coverage system.

3. One- and two-family dwellings and townhouses.

4. Subject to the approval of the fire code official, buildings other than high-rise buildings, colleges, universities and buildings primarily occupied by Group E or I occupancies that have completed a Mobile Emergency Responder Radio Coverage application and submitted payment as outlined in the application.

510.1.1 Occupancy**.** It shall be unlawful to occupy any portion of a building or structure until Emergency Responder Radio Coverage have been tested and *approved* in accordance with the provisions of Section 510.

510.2 Emergency responder radio coverage in existing buildings. Existing buildings shall have *approved* radio coverage for emergency responders as required in Chapter 11.

510.3 Permit required. A construction permit for the installation of or modification to emergency responder radio coverage systems and related equipment is required as specified in Section 105.7.6. Maintenance performed in accordance with this code is not considered a modification and does not require a permit.

Point of Information

Prior coordination and approval from the Public Safety Radio System Operator is required before installation of an Emergency Responder Radio System. Until 2023, such approval is required from EPSCA, King County, Seattle or ValleyCom depending on the location of the installation. In 2023 PSERN will be the single operator of a county wide system.

In order to be forward compatible, designers and contractors should be aware of PSERN's requirements for Distributed Antenna Systems which can be found via https://psern.org/requirements/

510.4 Technical requirements. Systems, components and equipment required to provide the emergency responder radio coverage system shall comply with Sections 510.4.1 through 510.4.2.8.

510.4.1 Emergency responder communication enhancement system signal strength. The building shall be considered to have acceptable emergency responder communications enhancement system coverage when signal strength measurements in 95 percent of all areas on each floor of the building meet the signal strength requirements in Sections 510.4.1.1 through 510.4.1.3.

Exception: Critical areas, such as the fire command center(s), the fire pump room(s), interior exit stairways, exit passageways, elevator lobbies, standpipe cabinets, sprinkler sectional valve locations, and other areas required by the *fire code official*, shall be provided with 99 percent floor area radio coverage.

[WS]510.4.1.1 Minimum signal strength into the building. The minimum inbound signal strength shall be sufficient to provide usable voice communications throughout the coverage area as specified by the *fire code official*. The inbound signal level shall be a minimum of -95dBm in 95% of the coverage area and 99% in critical areas and sufficient to provide not less than a Delivered Audio Quality (DAQ) of 3.0 or an equivalent Signal-to-Interference-Plus-Noise Ratio (SINR) applicable to the technology for either analog or digital signals.

510.4.1.2 Minimum signal strength out of the building. The minimum outbound signal strength shall be sufficient to provide usable voice communications throughout the coverage area as specified by the *fire code official*. The outbound signal level shall be sufficient to provide not less than a DAQ of 3.0 or an equivalent SINR applicable to the technology for either analog or digital signals. A minimum signal strength of -95 dBm shall be received by the King County Regional 800 MHz Radio System when transmitted from within the building.

510.4.1.3 System performance. Signal strength shall be sufficient to meet the requirements of the applications being utilized by public safety for emergency

operations through the coverage area as specified by the *Public Safety Radio System Operator* in Section 510.4.2.2.

510.4.2 System design. The emergency responder radio coverage system shall be designed in accordance with Sections 510.4.2.1 through 510.4.2.8 and NFPA 1221 (2019).

510.4.2.1 Amplification systems and components. Buildings and structures that cannot support the required level of radio coverage shall be equipped with systems and components to enhance the public safety radio signals and achieve the required level of radio coverage specified in Sections 510.4.1 through 510.4.1.3. Public safety communications enhancement systems utilizing radio-frequency-emitting devices and cabling shall be allowed by the *Public Safety Radio System Operator*. Prior to installation, all RF-emitting devices shall have the certification of the radio licensing authority and be suitable for public safety use.

510.4.2.2 Technical criteria. The *Public Safety Radio System Operator* shall provide the various frequencies required, the location of radio sites, the effective radiated power of radio sites, the maximum propagation delay in microseconds, the applications being used and other supporting technical information necessary for system design upon request by the building owner or owner's representative.

510.4.2.3 Power supply sources. Emergency responder radio coverage systems shall be provided with dedicated standby batteries or provided with 2-hour standby batteries and connected to the facility generator power system in accordance with Section 1203. The standby power supply shall be capable of operating the emergency responder radio coverage system at 100-percent system capacity for a duration of not less than 12 hours.

[WS]510.4.2.4 Signal booster requirements. If used, signal boosters shall meet the following requirements:

1. All signal booster components shall be contained in a National Electrical Manufacturer's Association (NEMA) 4, IP66-type waterproof cabinet or equivalent.

   Exception: Listed battery systems that are contained in integrated battery cabinets.

2. Battery systems used for the emergency power source shall be contained in a NEMA 3R or higher-rated cabinet, IP65-type waterproof cabinet or equivalent.

3. Equipment shall have FCC or other radio licensing authority certification and be suitable for public safety use prior to installation.

4. Where a donor antenna exists, isolation shall be maintained between the donor antenna and all inside antennas to not less than 20dB greater than the system gain under all operating conditions.
5. Bi-Directional Amplifiers (BDAs) used in emergency responder radio coverage systems shall be fitted with anti-oscillation circuitry and per-channel AGC.
6. The installation of amplification systems or systems that operate on or provide the means to cause interference on any emergency responder radio coverage networks shall be coordinated and *approved* by the *Public Safety Radio System Operator*.
7. Unless otherwise *approved* by the *Public Safety Radio System Operator*, only channelized signal boosters shall be permitted.

Exception: Broadband BDA's may be utilized when specifically authorized in writing by the Public Safety Radio System Operator.

Point of Information

BDA's must also comply with PSERN's (www.psern.org/requirements) detailed requirements, which include channelized, minimum of 28 channels, supporting analog, P25 Phase I (FDMA), and P25 Phase II (TDMA).

510.4.2.5 System monitoring. The emergency responder radio enhancement system shall include automatic supervisory and trouble signals that are monitored by a supervisory service and are annunciated by the fire alarm system in accordance with NFPA 72. The following conditions shall be separately annunciated by the fire alarm system, or, if the status of each of the following conditions is individually displayed on a dedicated panel on the radio enhancement system, a single automatic supervisory signal may be annunciated on the fire alarm system indicating deficiencies of the radio enhancement system:

1. Loss of normal AC power supply.
2. System battery charger(s) failure.
3. Malfunction of the donor antenna(s).
4. Failure of active RF-emitting device(s).
5. Low-battery capacity at 70-percent reduction of operating capacity.
6. Active system component malfunction.
7. Malfunction of the communications link between the fire alarm system and the emergency responder radio enhancement system.

510.4.2.6 Additional frequencies and change of frequencies. The emergency responder radio coverage system shall be capable of modification or expansion in the event frequency changes are required by the FCC or other radio licensing authority, or additional frequencies are made available by the FCC or other radio licensing authority.

510.4.2.7 Design documents. The *fire code official* shall have the authority to require “as-built” design documents and specifications for emergency responder communications coverage systems. The documents shall be in a format acceptable to the *fire code official*.

510.4.2.8 Radio communication antenna density. Systems shall be engineered to minimize the near-far effect. Radio enhancement system designs shall include sufficient antenna density to address reduced gain conditions.

Exceptions:

1. Class A narrow band signal booster devices with independent AGC/ALC circuits per channel.
2. Systems where all portable devices within the same band use active power control

[WS]510.5 Installation requirements. The installation of the public safety radio coverage system shall be in accordance with NFPA 1221 (2019) and Sections 510.5.1 through 510.5.7.

510.5.1 Approval prior to installation. Amplification systems capable of operating on frequencies licensed to any public safety agency by the FCC or other radio licensing authority shall not be installed without prior coordination and approval of the *Public Safety Radio System Operator.*

510.5.2 Minimum qualifications of personnel. The minimum qualifications of the system designer and lead installation personnel shall include both of the following:

1. A valid FCC-issued general radio telephone operators license.
2. Certification of in-building system training issued by an *approved* organization or *approved* school, or a certificate issued by the manufacturer of the equipment being installed.

510.5.3 Acceptance test procedure. Where an emergency responder radio coverage system is required, and upon completion of installation, the building owner shall have the radio system tested to verify that two-way coverage on each floor of the building is in accordance with Section 510.4.1. The test procedure shall be conducted as follows:

1. Each floor of the building shall be divided into a grid of 20 approximately equal test areas, with a maximum test area size of 6,400 square feet. Where the floor area exceeds 128,000 square feet, the floor shall be divided into as many approximately equal test areas as needed, such that no test area exceeds the maximum square footage allowed for a test area.

2. Coverage testing of signal strength shall be conducted using a calibrated spectrum analyzer for each of the test grids. A diagram of this testing shall be created for each floor where coverage is provided, indicating the testing grid used for the test in Section 510.5.3(1), and including signal strengths and frequencies for each test area. Indicate all critical areas.

3. Functional talk-back testing shall be conducted using two calibrated portable radios of the latest brand and model used by the agency's radio communications system or other equipment *approved* by the *fire code official*. Testing shall use Digital Audible Quality (DAQ) metrics, where a passing result is a DAQ of 3 or higher. Communications between handsets shall be tested and recorded in the grid square diagram required by section 510.5.3(2): each grid square on each floor; between each critical area and a radio outside the building; between each critical area and the fire command center or fire alarm control panel; between each landing in each stairwell and the fire command center or fire alarm control panel.

4. Failure of more than 5% of the test areas on any floor shall result in failure of the test.

   Exception: Critical areas shall be provided with 99 percent floor area coverage.

5. In the event that two of the test areas fail the test, in order to be more statistically accurate, the floor shall be permitted to be divided into 40 equal test areas. Failure of not more than two nonadjacent test areas shall not result in failure of the test. If the system fails the 40-area test, the system shall be altered to meet the 95-percent coverage requirement.

6. A test location approximately in the center of each test area shall be selected for the test, with the radio enabled to verify two-way communications to and from the outside of the building through the public agency's radio communications system. Once the test location has been selected, that location shall represent the entire test area. Failure in the selected test location shall be considered to be a failure of that test area. Additional test locations shall not be permitted.

7. The gain values of all amplifiers shall be measured, and the test measurement results shall be kept on file with the building owner so that the measurements can be verified during annual tests. In the event that the measurement results become lost, the building owner shall be required to rerun the acceptance test to reestablish the gain values.

8. As part of the installation, a spectrum analyzer or other suitable test equipment shall be utilized to ensure spurious oscillations are not being generated by the subject signal booster. This test shall be conducted at the time of installation and at subsequent annual inspections.

9. Systems incorporating Class B signal booster devices or Class B broadband fiber remote devices shall be tested using two portable radios simultaneously conducting subjective voice quality checks. One portable radio shall be positioned not greater than 10 feet (3048 mm) from the indoor antenna. The second portable radio shall be positioned at a distance that represents the farthest distance from any indoor antenna. With both portable radios simultaneously keyed up on different frequencies within the same band, subjective audio testing shall be conducted and comply with DAQ levels as specified in Sections 510.4.1.1 and 510.4.1.2.

10. Documentation maintained on premises. At the conclusion of the testing, and prior to issuance of the building Certificate of Occupancy, the building owner or owner's representative shall place a copy of the following records in the DAS enclosure or the building engineer's office. The records shall be available to the *fire code official* and maintained by the building owner for the life of the system:

    a. A certification letter stating that the emergency responder radio coverage system has been installed and tested in accordance with this code, and that the system is complete and fully functional.
    b. The grid square diagram created as part of testing in Sections 510.5.3(2) and 510.5.3(3).
    c. Data sheets and/or manufacturer specifications for the emergency responder radio coverage system equipment; back up battery; and charging system (if utilized).
    d. A diagram showing device locations and wiring schematic,
    e. A copy of the electrical permit.

11. Acceptance test reporting to *fire code official*. At the conclusion of the testing, and prior to issuance of the building Certificate of Occupancy, the building owner or owner's representative shall submit to the *fire code official* a report of the acceptance test by way of the department's third-party vendor thecomplianceengine.com.

510.5.4 FCC compliance. The emergency responder radio coverage system installation and components shall comply with all applicable federal regulations including, but not limited to, FCC 47 CFR Part 90.219.

[WS] 510.5.5 Mounting of the donor antenna (s). To maintain proper alignment with the system designed donor site, donor antennas shall be permanently affixed on the highest possible position on the building or where *approved* by the *fire code official*. A clearly visible sign shall be placed near the antenna stating, "movement or repositioning of this antenna is prohibited without approval from the *fire code official*." The antenna installation shall be in accordance with the applicable requirements in the International Building Code for weather protection of the building envelope.

510.5.6 Wiring. The backbone, antenna distribution, radiating, or any fiber-optic cables shall be rated as plenum cables. The backbone cables shall be connected to the antenna distribution, radiating, or copper cables using hybrid coupler devices of a value determined by the overall design. Backbone cables shall be routed through an enclosure that matches the building's required fire-resistance rating for shafts or interior exit stairways. The connection between the backbone cable and the antenna cables shall be made within an enclosure that matches the building's fire-resistance rating for shafts or interior exit stairways, and passage of the antenna distribution cable in and out of the enclosure shall be protected as a penetration per the International Building Code.

510.5.7 Identification Signs. Emergency responder radio coverage systems shall be identified by an *approved* sign located on or near the Fire Alarm Control Panel or other *approved* location stating "This building is equipped with an Emergency Responder Radio Coverage System. Control Equipment located in room (insert information provided by owner)".

A sign stating "Emergency Responder Radio Coverage System Equipment" shall be placed on or adjacent to the door of the room containing the main system components.

510.6 Maintenance. The emergency responder radio coverage system shall be maintained operational at all times in accordance with Sections 510.6.1 through 510.6.4.

[WS]510.6.1 Testing and proof of compliance. The owner of the building or owner's authorized agent shall have the emergency responder radio coverage system inspected and tested annually or where structural changes occur including additions or remodels that could materially change the original field performance tests. Testing shall consist of the following items (1) through (7):

1. In-building coverage test as required by the *fire code official* as described in Section 510.5.3 “Acceptance test procedure” or 510.6.1.1 “Alternative in-building coverage test”.

   Exception: Group R Occupancy annual testing is not required within dwelling units.

2. Signal boosters shall be tested to verify that the gain/output level is the same as it was upon initial installation and acceptance or set to optimize the performance of the system.

3. Backup batteries and power supplies shall be tested under load of a period of 2 hours to verify that they will properly operate during an actual power outage. If within the 2-hour test period the battery exhibits symptoms of failure, the test shall be extended for additional 1-hour periods until the integrity of the battery can be determined.

4. If a fire alarm system is present in the building, a test shall be conducted to verify that the fire alarm system is properly supervising the emergency responder communication system as required in Section 510.4.2.5. The test is performed by simulating alarms to the fire alarm control panel. The certifications in Section 510.5.2 are sufficient for the personnel performing this testing.

5. Other active components shall be checked to verify operation within the manufacturer’s specifications.

6. At the conclusion of the testing, a report, which shall verify compliance with Section 510.6.1, shall be submitted to the *fire code official* by way of the department’s third-party vendor thecomplianceengine.com

7. At the conclusion of testing, a record of the inspection and maintenance along with an updated grid diagram of each floor showing tested strengths in each grid square and each critical area shall be added to the documentation maintained on the premises in accordance with Section 510.5.3.

510.6.1.1 Alternative In-building coverage test. When the comprehensive test documentation required by Section 510.5.3 is available, or the most recent full five-year test results are available if the system is older than six years, the in-building coverage test required by the *fire code official* in Section 510.6.1(1), may be conducted as follows:

1. Functional talk-back testing shall be conducted using two calibrated portable radios of the latest brand and model used by the agency’s radio communications system or other equipment *approved* by the *fire code official*. Testing shall use Digital Audible Quality (DAQ) metrics, where a passing result is a DAQ of 3 or higher. Communications between handsets in

the following locations shall be tested: between the fire command center or fire alarm control panel and a location outside the building; between the fire alarm control panel and each landing in each stairwell.

2. Coverage testing of signal strength shall be conducted using a calibrated spectrum analyzer for:

(a) Three grid areas per floor. The three grid areas to be tested on each floor are the three grid areas with poorest performance in the acceptance test or the most recent annual test, whichever is more recent; and

(b) Each of the critical areas identified in acceptance test documentation required by Section 510.5.3, or as modified by the *fire code official*, and

(c) One grid square per serving antenna.

3. The test area boundaries shall not deviate from the areas established at the time of the acceptance test, or as modified by the *fire code official*. The building shall be considered to have acceptable emergency responder radio coverage when the required signal strength requirements in 510.4.1.1 and 510.4.1.2 are located in 95 percent of all areas on each floor of the building and 99 percent in Critical Areas, and any non-functional serving antenna are repaired to function within normal ranges. If the documentation of the acceptance test or most recent previous annual test results are not available or acceptable to the *fire code official*, the radio coverage verification testing described in 510.5.3 shall be conducted.

Point of Information

The alternative in-building coverage test provides an alternative testing protocol for the in-building coverage test in subsection (1) of section 510.6.1. There is no change or alternative to annual testing requirements enumerated in subsections (2) – (7) of Section 510.6.1, which must be performed at the time of each annual test.

510.6.2 Additional frequencies. The building owner shall modify or expand the emergency responder radio coverage system at his or her expense in the event frequency changes are required by the FCC or other radio licensing authority, or additional frequencies are made available by the FCC, *Public Safety Radio System Operator,* or FCC license holder. Prior approval of a public safety radio coverage system on previous frequencies does not exempt this section.

510.6.3 Nonpublic safety system. Where other nonpublic safety amplification systems installed in buildings reduce the performance or cause interference with the emergency responder communications coverage system, the nonpublic safety amplification system shall be corrected or removed.

510.6.4 Field testing. Agency personnel shall have the right to enter onto the property at any reasonable time to conduct field testing to verify the required level of radio coverage or to disable a system that due to malfunction or poor maintenance has the potential to impact the emergency responder radio system in the region.

SECTION 3. Chapter 6 of the International Fire Code is hereby amended by the addition of new Section 23.11.607.9 to the Bellevue City Code regarding Elevator Maintenance to read as follows:

23.11.607.9 International Fire Code Section 607.9 added – Elevator Maintenance

607.9 Duty of building operators to repair elevator and give notice. Any owner or lessor of the entirety of a building subject to this chapter, or any agent thereof with the responsibility for managing such building (hereafter "building operator") shall ensure that the elevator is accessible, usable and in good working order at all times.

607.9.1 Communication. Whenever an elevator is out of service, the building operator shall provide notice to all occupants in the building via text, e-mail, or phone call as well as a written notice posted on or adjacent to the elevator on each floor. The notice shall contain at least the following information:

1. The anticipated date and time that elevator service will resume;
2. Accommodations available for occupants that are dependent on elevator; and
3. Contact information if occupants have any questions.

Exception: Non-residential buildings may limit the notice to a written notice posted with the above information on or adjacent to the elevator on each floor.

607.9.2 Residential Buildings Served by a Single Elevator Level of Service. Buildings served by a single elevator shall maintain a full-service maintenance contract with a Washington State Licensed Elevator Company that provides the industries' highest-level service.

607.9.3 Accommodations for Residential Buildings Served by a Single Elevator. Residential building served by a single elevator shall maintain a plan to address out of service conditions for mobility impaired occupants at no cost to the occupant. Such plan shall include at least the following elements:

1. Transportation in and out of the building. Building operators shall maintain a list of companies qualified to transport mobility impaired individuals in and out of the building up to once per day at no expense to the individual when elevator is out of service for up to 24 hours.
2. Alternate housing. When the elevator is out of service for longer than 72 hours, the building operator shall provide upon request alternative housing for any person residing in the building who needs to use the elevator to gain

access to or egress from his or her unit because of such person's impaired ability to climb stairs as a result of such person's physical disability, medical condition, infirmity, illness or other disability. Such alternative housing shall be decent, safe, sanitary and provide reasonable accommodation for the persons disability. Any alternate housing shall be provided at the building operator's expense. The duty to provide alternative housing shall not arise if the building operator is prevented from repairing the elevator within seventy-two hours or any time thereafter due to a natural disaster or an act of God.

607.9.4 Failure to timely repair--Civil remedies. Where the failure to timely repair an elevator or to provide alternative housing, as required by Section 607.9 results in any person residing in the building having substantially restricted access to or egress from his or her unit because of such person's impaired ability to climb stairs as a result of such person's physical disability, medical condition, infirmity, illness or other similar circumstance, the person whose access to or egress from such building has been substantially restricted as set forth in this subsection may request the City of Bellevue initiate a code compliance investigation. If upon investigation the City of Bellevue determines a building operator has violated a provision of BCC 11.23.607 it may issue a civil violation pursuant to BCC 1.18 and also pursue such other legal remedies as may be appropriate.

607.9.5 Prohibition on retaliation and discrimination in renting.

A. No landlord or building operator may bring or threaten to bring an action to recover possession, cause a tenant to quit the unit involuntarily, serve any notice to quit or notice of termination of tenancy, decrease any services or increase the rent where the landlord's intention is retaliation against the tenant for the tenant's assertion or exercise of rights under this chapter by reason of their disability. Such retaliation shall be a defense to an action to recover possession, or it may serve as a basis for an affirmative suit by the tenant for actual and punitive damages and injunctive relief as may be available through the Human Rights Commission pursuant to RCW 49.60, or other legal remedy.

B. It shall be illegal for any landlord to refuse to rent to any persons on the grounds that they may assert their rights under this chapter because they require an elevator for access to or egress from the building. Any such claim may be made to the Human Rights Commission pursuant to RCW 49.60.

607.9.6 Remedies cumulative. The remedies provided by this chapter are in addition to all other remedies available to any party with respect to ensuring accessibility and usability of elevators.

SECTION 4. Bellevue City Code section 23.11.917 is hereby repealed in its entirety.

SECTION 5. Chapter 9 of the International Fire Code is hereby amended by the addition of new section 23.11.919 to the Bellevue City Code regarding Firefighter Replenishment Air Systems to read as follows:

23.11.919 International Fire Code Section 919 added – Firefighter Replenishment Air System.

SECTION 919
FIREFIGHTER AIR REPLENSHMENT SYSTEMS

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

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.

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*.

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, and final locations shall be *approved* by the *fire code official*.

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.

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

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.

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.

919.4.5 Contractor qualifications. The firefighter air replenishment system shall be installed by a Washington State licensed 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.

919.5 Performance and design criteria.

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 70^0F with a 4:1 safety factor.

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.

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.

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.

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.

919.6 Permits, plans and fees.

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

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.

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.

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.

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, *approved* and a permit issued by the *fire code official*.

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

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 IFC. 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.

919.7 System components. All pressurized breathing air components of the firefighter air replenishment system shall be listed by a nationally recognized testing laboratory or agency and *approved* by the *fire code official*. 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; and
6. Interconnected piping distribution system
7. Associated wiring

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;
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.

919.7.2. Electrical power. The following features serving the firefighter air replenishment system shall be supplied by both the 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

919.7.3 Materials of construction. All breathing air components used in the construction of the firefighter air **r**eplenishment 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 70^0F with a minimum 4:1 safety factor.

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.

919.8 Exterior fire department connection panel and enclosure.

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

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.

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.

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.

919.8.5 Enclosure marking. The front of the enclosures shall be marked FIREFIGHTER AIR REPLENSHMENT 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.

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.

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.

919.9 Interior air fill station and air fill panel.

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

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.*

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.

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.

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.

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 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.*

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 6 feet clear distance that provides a 180-degree clear unobstructed access to the front of the panels. The enclosure shall have emergency illumination and at least one 120-volt AC duplex grounded receptacle supplied from the building *emergency power system*.

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*.

919.10 Markings.

919.10.1 Enclosure. Each air fill station enclosure shall be marked FIREFIGHTER AIR REPLENSHMENT 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.

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.

919.10.3 Air fill station marking. The front of each air fill station shall be marked FIREFIGHTER AIR REPLENSHMENT 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.

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.

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.

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.*

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.

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*.

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.

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.*

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.

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.

919.12 Air storage system.

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

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.

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.

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 40^0F or more than 80^0F 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*.

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*.

919.12.6 Enclosure marking. The air storage enclosure shall be marked FIREFIGHTER AIR REPLENSHMENT 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.

919.12.7 Air storage system marking. The air storage system shall be marked FIREFIGHTER AIR REPLENSHMENT 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.

919.13 Piping, distribution materials and methods.

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.

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 with a minimum 4:1 safety factor. The internal surfaces of all pressurized material shall be free of contamination.

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 Grade 316 fully annealed seamless. Stainless steel tubing shall be at least Grade 316 and shall 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.

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.

919.13.5 Marking. All tubing shall be clearly marked FIREFIGHTER AIR REPLENSHMENT 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.

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.

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 72^{o}F. 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 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.

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.

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.

919.15 Final testing, inspection and commissioning.

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.

919.15.2 Testing procedures.

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*.

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.

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.

919.15.2.4 Air Fill Station Inlets Secured During Testing. During the period of air quality analysis, the air fill stations 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.

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.

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.

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.

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.

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.

919.15.3 System acceptance and final commissioning.

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*.

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*.

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.

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 70^0F 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

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.

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 6. 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 7. This ordinance shall take effect and be in force on October 29, 2020.

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Passed by the City Council this _____ day of____, 2020 and signed in authentication of its passage this _____ day of____ , 2020.

(SEAL)

_____
Lynne Robinson, Mayor

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

_____
Chad Barnes, Assistant City Attorney

Attest:

_____
Charmaine Arredondo, City Clerk

Published _____.