



High-Rise Checklist

2021 International Building Code



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High-Rise Checklist

Use this checklist to prepare for pre-development services meetings and to serve as a design and review aid for high-rise buildings as described in the 2021 International Building Code. This checklist is not intended to address all possible conditions.

Please note that there are several City of Bellevue (COB) amendments to the multifamily provisions in the International Building Code (IBC) and International Fire Code (IFC). The city has provided online read-only documents so the codes can be viewed with Washington State amendments, city amendments, deleted and replaced text, errata and points of information. These documents include both state and city amendments. Where the city replaces the administrative requirements in Chapter 1 of adopted codes, references are specifically made using Bellevue City Code (BCC) sections. These code sections are also found in the online codes. For additional requirements, refer to the Washington Cities Electrical Code (WCEC), the standards of the National Fire Protection Association (NFPA) as specifically referenced in the IFC, the currently adopted edition of the National Electrical Code (NEC), Accessible and Usable Buildings and Facilities ICC A117.1-2017 (ICC) and American Society of Civil Engineers (ASCE) 7-16.

For additional information and resources, please visit the City of Bellevue [Development Services Website](#).

General Building Code Requirements

- **List basic code information** such as number of stories and basements, building address(es), etc.
- **High-rise Building definition** modified in IBC 202 as: A building with an occupied floor or occupied roof located more than 75 feet above the lowest level of fire department vehicle access. For the purposes of this definition, an occupied roof with an occupant load of more is an occupied floor.
- **Standby Power System definition** modified in IBC 202 as: All references to Standby power System shall be considered to indicate Legally Required Standby Power in accordance with the Washington Cities Electrical Code, and NFPA 70 (National Electrical Code), and shall be in accordance with Chapter 27 Legally Required Standby power, as a source of automatic electric power of a required capacity and duration to operate required building, hazardous materials or ventilation systems in the event of a failure of the primary power. Standby power systems are required for electrical loads where interruption of the primary power could create hazards or hamper rescue or fire-fighting operations.

- **Indicate if the building is reducing the fire-resistance rating per IBC 403.2.1.** Where sprinkler-control valves are equipped with supervisory initiating devices and water-flow initiating devices for each floor, reductions in fire-resistive ratings may apply. These devices are required by IFC 914.3.1.3. In some cases, a reduction of the type of construction for specified elements is not permitted.
- **Multiple buildings above Group S-3 parking garages** shall comply with IBC 510.9.
- **Show the distance to property lines** and to the centerline of public ways. Provide fire-resistance ratings of exterior walls per IBC Table 602 and opening protection per IBC Table 705.8.
- **For underground buildings**, refer to IBC 405 for requirements for compartmentation, smoke-control systems, smoke-proof or pressurized enclosures, standby and emergency power, etc. Refer to IBC 12 for requirements at smoke-roof or pressurized enclosures at required stairways serving floor levels more than 30 feet below the finished floor of its level of exit discharge.
- **Accessibility.** Identify accessible routes of travel between buildings on the site and to all amenity spaces within the building per IBC 1104.2. Show locations of accessible entrances per IBC 1105, not less than 60 percent of public entrances shall be accessible. Show locations of all accessible parking spaces, van-accessible parking spaces, passenger-loading zones, and the route of travel from these spaces to building entrances per IBC 1106. Accessible means of egress must be provided per IBC 1009.
- **Deferred submittals.** List all deferred submittals on the drawings per BCC 23.05.105(E); items to be submitted as deferred submittals must be approved. Typical deferred submittals include curtain walls; fire stopping; prefabricated stairs; signage; seismic anchorage of architectural, mechanical, and electrical components and systems (IBC 1613.1 & ASCE, Chapter 13); etc.
- **Construction documents** submitted for review must be complete and bear the seal and signature of the appropriate design professional per BCC 23.05.105(A). Typically, only architectural and structural drawings will be reviewed for the building permit; however, the submitted documents must contain all necessary information to review building code issues such as exit signs, exit lighting, indication of how emergency power is provided, audible/visible alarms, stairway communication systems, smoke detectors, smoke control concept language, smoke zone boundaries, etc. Separate permit applications and associated drawings are required for mechanical, electrical, fire and plumbing work.
- **Fire-resistant joint systems.** Protection needs to be provided at joints between rated walls, floors, and roofs per IBC 715.1 and at the void created at the intersection of a floor/ceiling assembly and an exterior curtain wall assembly per

IBC 715.4 through 715.7. Specific approved assemblies should be referenced on the drawings unless specifically listed as a deferred submittal.

- **Fire blocking.** When combustible construction is allowed by IBC 603.1, consideration should be provided for the fire-blocking requirement at the interconnections between concealed vertical stud wall or partition spaces and concealed horizontal spaces at floors per IBC 718.2.3. Curtain walls should have fire-blocking details.
- **Fire-resistive assemblies** need to be specifically identified on the drawings by type (i.e., fire barrier, fire partition), hourly rating, testing agency and listed assembly number. All materials and components as well as connection information not deviating from the listed assembly needs to be called out on the drawings for each assembly used.
- **Sprayed fire-resistant material (SFRM)** shall comply with IBC 704.13. The bond strength of spray applied fire-resistant materials shall be in accordance with IBC Table 403.2.3.
- **Fire walls/barriers/partitions, smoke barriers/partitions and horizontal assemblies** shall be identified per IBC 706 through 711.
- **Pedestrian protection** must be provided per IBC 3306. A [Right of Way Use Permit](#) may be required if work impacts the public right of way. For more information, review the [Pedestrian Protection Requirements](#).
- **Temporary or phased occupancy** is regulated by BCC 23.05.140(C) and may require a performance bond or other assurance device.
- **Operable windows.** In R-2 occupancies, windowsills of operable windows located more than 72 inches above the finished grade must be a minimum of 36 inches above the finished floor per IBC 1015.8.
- **A clear headroom height of seven feet** must be provided in garages per IBC 406.2.2. This needs to be shown in section on the drawings and clearance at sprinkler piping, drainpipes, mechanical ductwork, exit signs, etc. must be considered. Additional vertical clearance is required at van-accessible parking spaces per ICC 502.6.
- **Code alternates.** Where alternate materials, design and methods of construction and equipment are approved, they must be specifically referenced on the drawings. Preapproved Alternate Materials, Methods, or Modifications Request Forms must be provided on the drawings. Refer to BCC 23.05.080(K).
- **Door and hardware schedule.** A complete door and hardware schedule must be provided to address special egress-control devices, closers, smoke protection, fire-resistance ratings, etc. Special doors or doors with controlled access must be identified and in compliance with the requirements in IBC 1010.2.

- **Energy code compliance.** Specify method of complying with WSEC C401.2. If utilizing total building performance per WSEC C407, all applicable mechanical, electrical, and plumbing permit applications must be submitted with the building permit application.
- **Electric vehicle charging infrastructure** must be specified on the plans and comply with IBC 429.

Egress and Shafts

- **Electric vehicle charging infrastructure** must be specified on the plans and comply with IBC 429.
- **Phased evacuation** is required for buildings more than 10 stories above grade plane in accordance with IBC 907.5.2.2.6. See exceptions.
- **Remoteness of exit stairway enclosures.** Per IBC 403.5.1, required interior exit stairways shall be separated by a distance not less than 30 feet or not less than one-fourth of the length of the maximum overall diagonal dimension of the building or area to be served, whichever is less. The distance shall be measured in a straight line between the nearest points of the enclosure surrounding the interior exit stairways. In buildings with three or more interior exit stairways, no fewer than two of the interior exit stairways shall comply with this section. Interlocking or scissor stairways shall be counted as one interior exit stairway.
- **Additional interior exit stairway may be required** per IBC 403.5.2 for buildings other than Group R-2 and their ancillary spaces that are more than 420 feet in building height. Per the exception, the additional exit stairway is not required where buildings have elevators used for occupant self-evacuation in accordance with IBC 3008.
- **Stairway door operation.** Specify any doors to be locked from the stairway side. These doors must be capable of being unlocked simultaneously without unlatching upon a signal from the fire command center per IBC 403.5.3 and IFC 508.1.6, Item 7. Stairway doors must also unlock automatically upon activation of the fire alarm system when phased evacuation is utilized.
- **Stairway communications system.** A telephone or other two-way communications system connected to an approved constantly attended station is required at not less than every fifth floor in each stairway where the doors to the stairway are locked per IBC 403.5.3.1. Please note that a building radio system does not substitute for this requirement.
- **Stair pressurization or smoke-proof enclosures.** Per IBC 403.5.4 & 405.7.2, every required interior exit stairway serving floors more than 75 feet above the

lowest level of fire department vehicle access or more than 30 feet below the finish floor of its level of exit discharge shall be a smoke-proof enclosure or pressurized stairway in accordance with IBC 909.20. Identify each pressurized stair and the extent of each in the drawings. Refer to IBC 1023.11 for additional requirements on termination, extension and enclosure access. Protection of equipment, control wiring, power wiring and ductwork is required; see [Smoke Control](#) section.

- **Luminous egress path markings** shall be provided in accordance with IBC 403.5.5 & 1025.
- **Means of egress sizing** must be calculated per IBC 1005.1. The maximum anticipated occupant load should be carefully considered to accommodate future tenant uses.
- **Egress convergence.** Where exits from floors above and below converge at an intermediate level, the capacity of the means of egress from the point of convergence must be the sum of the occupant loads of the two floors per IBC 1005.6.
- **Exit signs** must be provided per IBC 1013.1. Raised character and braille exit signs are required to be provided per IBC 1013.4, IBC 1112.1, and ICC 703.
- **The common path of egress travel** needs to be considered per IBC 1006.2. This should be carefully considered for future tenant improvement layouts.
- **Shaft enclosures.** Indicate if applying the provisions in IBC 403.2.1.2 for buildings not greater than 420 feet in building height, where the required fire-resistance rating of the fire barriers enclosing vertical shafts, other than interior exit stairway and elevator hoistway enclosures, is permitted to be reduced to 1 hour where automatic sprinklers are installed within the shafts at the top and at alternate floor levels.
- **Structural integrity of interior exit stairways and elevator hoistway enclosures.** For high-rise buildings of Risk Category III or IV in accordance with IBC 1604.5 and for all buildings that are more than 420 feet in building height, enclosures for interior exit stairways and elevator hoistway enclosures shall comply with IBC 403.2.2.
- **Stairway to roof.** One stairway must extend to the roof per IBC 1011.12. Where a stairway is provided to a roof, a penthouse shall be provided except in buildings without occupied roofs, access is permitted by a hatch not less than 16 square feet in area having a minimum dimension of three feet. Roofs and penthouses containing elevator equipment that must be accessed for maintenance are required to be accessed by a stairway per IBC 1011.12.1.

- **Stairway identification signs.** Stairway identification signage shall be provided as per IBC 1023.9 (See City of Bellevue Public Information Handout Stairwell Identification Signs).
- **Means of egress illumination** level under normal power shall not be less than 10 foot-candle at the walking surface per IBC 1008.2.1.
- **Doors serving electrical rooms and working clearances** must be provided with exits or exit access doors that swing in the direction of egress travel and shall be provided with listed panic hardware or fire exit hardware where such rooms or working spaces contain equipment operating at more than 600 volts or for equipment operating at 600 volts or less and rated at 800 amperes or more where the equipment contains overcurrent devices, switching devices or control devices per IBC 1010.2.9.2. Additionally, NEC 110.26(C)(3) requires doors to be provided with listed panic hardware for equipment rated at 1200 amperes or more and over six feet wide. Panic and fire exit hardware is not required where not less than 25 feet is provided from the electrical equipment. NEC 110.26 (C) #2 states that there shall be one entrance to and egress from the required working space at each end of the working space with some exceptions.
- **Firefighter Air System.** A pressurized air standpipe system with connection at the exterior of the building, running up through the two main stairways shall be designed in accordance with IFC 919.

Atriums

- **Smoke control** is required for atriums per IBC 404.5 except for atriums that connect only two stories in other than Group I-2, and group I-1 Condition 2, occupancies when all of the following are met:
 - 2.1. Only the two lowest stories shall be permitted to be open to the atrium.
 - 2.2. All stories above the lowest two stories shall be separated from the atrium in accordance with the provisions for a shaft in Section 713.4 Standby power is required for smoke control equipment in accordance with IBC 909.11 per IBC 404.7.
- **Enclosure of atriums.** All 1-hour fire barriers required by IBC 404.6, including 3/4-hour glass block assemblies and glass smoke partitions, shall be identified on the plans. Where fire barriers are not provided on any three floors, the volume of such unseparated spaces open to the atrium shall be accounted for in the design of the smoke control system.
- **Interior finish.** Specify the class of the interior finish of walls and ceilings of atriums. IBC 404.8 and 803 indicates that not less than a Class B interior finish is required with no reduction in class for sprinkler protection.

- **Travel distance.** Specify travel distances within the atrium on an egress plan. Per IBC 404.9 where the path of egress travel is not through the atrium or is through the atrium at the level of exit discharge, exit access travel distance shall be per IBC 1017. Where the path of travel is not at the level of exit discharge from the atrium, that portion of the total permitted exit access travel distance that occurs within the atrium shall be not greater than 200 feet.
- **Interior exit stairways** are limited to a maximum of 50 percent that are permitted to egress through an atrium on the level of exit discharge per IBC 404.10 & 1028.

Sprinkler Systems and Standpipes

- **Automatic sprinkler system and secondary water source.** IBC 403.3 requires high-rise buildings to be equipped throughout with an automatic sprinkler system in accordance with IBC 903.3.1.1 and a secondary water source per IBC 403.3.3.
- **Number of sprinkler risers and system design** shall be per IBC 403.3.1. Sprinkler risers shall be located remotely per IBC 403.3.1.1. Combination standpipe/sprinkler risers that are 6-inch pipe minimum are required and shut-off valves and water-flow devices are required on each floor per IBC 403.3.5.
- **Water supply to required fire pumps** in buildings that are more than 450 feet in building height must have fire pumps supplied by connections to no fewer than two water mains located in different streets and shall not serve other buildings per IBC 403.3.2.
- **Specify locations with quick-response sprinkler heads.** Quick-response heads are required per IFC 903.3.2 for typical light-hazard occupancies per NFPA 13. No intermixing of sprinkler heads is permitted in the same area.
- **Seismic restraint and bracing** of sprinkler and standpipe piping shall be detailed on sprinkler shop drawing submittals and shall include seismic restraint or bracing calculations with supporting details and seismic coefficient, as required by IFC 903.3.1.1.3 and NFPA 13.
- **Class I wet standpipes** are required to be provided per IFC 905.3.1 and 905.3.9.
- **Class I standpipe hose connections** are required to be provided on every intermediate floor level landing in every required stairway and elsewhere as required by NFPA 14 and IFC 905.4.
- **Standpipe systems during construction** shall be provided per IBC 3311 and IFC 3313, 3314.

- **Two fire department connections** are required for each high-rise building. Fire department connections shall be installed in accordance with IFC 914.3.1.3.
- **Floor control valves.** An approved supervised indicating control valves shall be provided on each floor, in accordance with IFC 903.4.3, so that an individual floor may be isolated without impairing additional floors.
- **Dry Standpipes** are not permitted per IFC 905.8.
- **Heat tracing.** All proposals for heat tracing must be approved by the fire code official prior to submittal of sprinkler drawings. Sprinkler designs lacking this prior approval or substituting heat tracing for proper routing through conditioned spaces will not be accepted.
- **Fire pump rooms** shall be provided per IBC 403.3.4 and protected in accordance with IBC 913.2.1 and installed in accordance with NFPA 20. Fire pump controllers supplying standpipes greater than 130 psi shall be soft start.
- **Fire pumps** shall comply with NEC 695, IFC 913, and NFPA 20. The fire pumps (primary and secondary) must be sized to meet the sprinkler and hose demand as prescribed in IFC 905.3.9.
- **Fire pump room protection and access.** Per IBC 913.2.1, pumps shall be in rooms that are separated from all other areas of the building by 2-hour fire barriers constructed in accordance with IBC 707 or 2-hour horizontal assemblies constructed in accordance with IBC 711, or both. Fire pump rooms not directly accessible from the outside shall be accessible through an enclosed passageway from an enclosed stairway or exterior exit. The enclosed passageway shall have a fire-resistance rating not less than the fire-resistance rating of the fire pump room (see NFPA 20 Section 4.12.2.1.2).

Fire Alarm and Detection Systems

- **Emergency systems.** The detection, alarm and emergency systems of high-rise buildings shall comply with IBC 403.4.1 through 403.4.8, NEC 700 and 760, and WCEC 700.
- **The location of fire command centers** needs to be shown on the drawings per IBC 403.4.6 and 911, as well as IFC 508. The fire command center location must be approved by the fire department, and it must be separated from the remainder of the building by not less than a two-hour fire barrier or horizontal assembly, or both.
- **Fire alarms** shall be provided per IBC 907 and NFPA 72 for each occupancy type and condition specified. Wiring for the fire alarm systems shall meet the requirements of NFPA 72 regarding survivability and IBC 909.20.6 as relates to shaft pressurization control wiring.

- **Audible and visible alarms.** Indicate the locations on the drawings where audible and visible alarm devices for I-1, R-1 and R-2 dwelling units or sleeping units are provided in accordance with IBC 907.5.2 and ICC 1006.
- **Automatic smoke detection** shall be provided per IBC 907.2.13.1. Area smoke detectors must be connected to the automatic fire alarm system and activate the emergency voice/alarm communication system.
- **A fire department communication system** shall be provided per IBC 907.2.12.3. An approved two-way fire department communication system designed and installed in accordance with NFPA 72 shall be provided for fire department use. This wired communication system is required in addition to the emergency responder radio coverage requirements in IFC 510.
- **An emergency voice/alarm communication system** shall be provided per IBC 907.5.2.2.
- **The occupant notification system** shall be provided per IFC 907.5.
- **Battery (UPS) rooms** must be specifically identified in the drawings. Provide an approved automatic smoke detection system in areas containing stationary lead-acid battery systems having liquid capacity of more than 50 gallons per IFC 907.2.23. Full compliance with IFC 608 is required regarding mechanical ventilation of UPS rooms.
- **Building radio coverage.** IFC 510 details the requirements for emergency responder radio coverage (800 MHz Radio). Field-testing is required per IFC 510.5.3.
- **Fire extinguishers** must be provided per IFC 906.1

Elevators

- **Elevators** shall comply with IBC 403.6 and IBC Chapter 30.
- **Hoistway opening protection** shall be provided per IBC 3006.2, Item 5, and shall be provided by one of the options in IBC 3006.3 including enclosed elevator lobbies, additional doors, or pressurization that complies with IBC 909.21. Protection of equipment, control wiring, power wiring and ductwork is required where pressurized; see Smoke Control section.
- **Standby power** is required for elevators in accordance with IBC Chapter 27; see Standby Power and Emergency Power Systems section.
- **Specify rating of shafts and opening protectives** per IBC 3002.1 & 713. The rating of elevator doors must be per IBC 713.7.
- **Number of elevator cars in a hoistway.** Where four or more elevator cars serve all or the same portion of a building, the elevators shall be in not fewer

than two separate hoistways per IBC 3002.2. Not more than four elevator cars shall be in any single hoistway enclosure.

- **Emergency signs.** Address all emergency signage per IBC 3002.3. Emergency signage is not required for elevators that are part of an accessible means of egress complying with IBC 1009.4 or occupant self-evacuation per IBC 3008.
- **Elevator car to accommodate ambulance stretcher.** At least one elevator shall be provided for fire department emergency access to all floors that can accommodate a stretcher per IBC 3002.4. Identify these elevators for each tower proposed to show that all floors are served.
- **Accessible means of egress.** IBC 1009.2.1 requires at least one elevator to comply with IBC 1009.4 at floors four or more stories above or below a level of exit discharge unless the floor is provided with a horizontal exit or ramp. IBC 1009.4 requires emergency operation, signaling devices, and standby power.
- **Machine Room Venting.** Specify the location of all elevator machine rooms and provide each area with independent ventilation or air-conditioning system to protect against the overheating of the electrical equipment per IBC 3005.2. Ventilation systems must use outdoor makeup air.
- **Pressurized machine rooms** are required where the machine room has openings onto a pressurized elevator hoistway. Activation shall be by heat or smoke detector located in the elevator machine room per IBC 3005.3.
- **Machine rooms and machinery spaces** located outside of but attached to a hoistway that have openings into the hoistway must be enclosed with construction having a fire-resistance rating not less than the required rating of the hoistway enclosure served by the machinery per IBC 3005.4; see also Exception 1. Openings must be protected with assemblies having a fire-resistance rating not less than that required for the hoistway enclosure doors.
- **Elevators** cannot open directly into interior exit stairways and ramps per IBC 1023.4.
- **Fire service access elevators** are required per IBC 403.6.1 in buildings with an occupied floor more than 120 feet above the lowest level of fire department vehicle access; a minimum of two fire service access elevators shall be provided in accordance with Section 3007.

Per IBC 403.6.1.1, each Fire Access Elevator shall be served by a different machine or control room.

- **Design requirements for fire service access elevators** shall comply with IBC 3007. Automatic sprinklers are prohibited in machine rooms and fire service access elevators per IBC 3007.2.1, an approved method to prevent water from infiltrating into the hoistway enclosures shall be provided per IBC 3007.3, a means for elevator shutdown shall not be installed per IBC 3007.4, hoistway

enclosures shall be protected in a shaft enclosure and must have structural integrity and lighting per IBC 3007.5.1, a lobby shall be provided per IBC 3007.6 unless the hoistway is pressurized, a pictorial symbol for the fire service access elevator must comply with IBC 3007.6.5, elevator system monitoring shall be provided per IBC 3007.7, electrical power with protection shall comply with IBC 3007.8, access to the standpipe hose connection shall be per IBC 3007.9, and Phase I emergency recall operations shall comply with IBC 3007.10.

- **Occupant evacuation elevators.** Where installed in accordance with IBC 3008, passenger elevators for public use shall be permitted to be used for occupant self-evacuation per IBC 403.6.2.
- **Design requirements for occupant evacuation elevators** shall comply with IBC 3008. A fire safety evacuation plan must be provided per IBC 3008.1.2, automatic sprinklers are prohibited in elevator machine rooms and hoistways of occupant evacuation elevators per IBC 3008.2.1, an approved method to prevent water from infiltrating into the hoistway enclosures shall be provided per IBC 3008.3, a means for elevator shutdown shall not be installed per IBC 3008.4, hoistway enclosures must have structural integrity per IBC 3008.5.1, lobbies are required per IBC 3008.6, approved signage must be provided per IBC 3008.6.5, a two-way communication system must be provided in each occupant evacuation elevator per IBC 3008.6.6, a lobby status indicator must be provided per IBC 3008.6.7, elevator system monitoring shall comply with IBC 3008.7, electrical power with protection shall comply with IBC 3008.8, an emergency voice/alarm communication system shall be provided per IBC 3008.9, and hazardous materials are restricted per IBC 3008.10.

Elevators

- Legally required standby and emergency power required. Refer to IBC 403.4.8, 2702 & 3003.
- **Elevator standby power.** The operation of elevator standby power must be in accordance with IBC 3003 and NEC 620 & 700.
- **Onsite fuel supply** must be provided per NEC 700.12(B)(1).
- **Stationary generators.** Emergency and standby power generators shall be listed in accordance with UL 2200 per IBC 2702.1.1, NEC 110.3 & 700.3 and IMC 915.
- **Fuel-fired emergency generator sets** and associated fuel storage, including optional standby generator sets, located more than 75 feet above the lowest level of fire department vehicle access or located at a floor level more than 30 feet below the lowest level of exit discharge requires the approval of the fire code official per IBC 2702.1.11.

- **Equipment room.** If the standby system is a generator set inside a building to support a smoke-control system, the generator set shall be in a separate room enclosed with 2-hour fire barriers, horizontal assemblies, or both, to separate it from the remainder of the building, the transfer switches, and from the normal power source including transformers and distribution equipment per IBC 2702.1.9.
- **Automatic transfer switches** shall be in a separate room from the generator enclosed with 2-hour fire barriers, horizontal assemblies, or both, to separate it from the remainder of the building.
- **Two sources of power** shall be provided for equipment and systems requiring legally required standby or emergency power per IBC 2702.1.9.
- **Penetration into equipment rooms** containing a standby or emergency generator set are prohibited except as permitted in IBC 403.4.8.1.1.
- **Protection of fuel line piping** is required per IBC 403.4.8.2.
- **Power distribution** from the emergency source to the emergency transfer switch shall be by an independent route from the normal power source per IBC 2702.1.9.
- **System supervision** with manual start and transfer features shall be provided at the fire command center per IBC 2702.1.9.
- **Equipment room ventilation** shall be provided directly from the exterior for generator combustion air and radiator cooling air per IBC 2702.1.9. Any ducts required for such ventilation shall be fire-resistance rated to the same level of protection as required for the equipment room. Fire dampers, shutters, or other self-closing devices shall not be permitted in ventilation openings or ductwork for supply or return/discharge air to legally required standby power and emergency power equipment rooms. However, motorized dampers are not prohibited per NFPA 110 Section 7.7.2.3. See also IBC 909.11, IMC 915, NFPA 37 and NFPA 110.
- **Equipment clearance.** Per NFPA 110 Section 7.2.6, the emergency power supply equipment shall be installed in a location that permits ready accessibility and a minimum of 36" from the outermost point of skid rails in the direction of access for inspection, repair, maintenance, cleaning, or replacement.
- **Equipment access** is required per IMC 306 and provisions made for replacement of equipment.
- **Other equipment.** NFPA 110 Section 5-2.2 & WCEC 700.6 prohibits the installation of any other electrical, plumbing and mechanical equipment within generator rooms other than those that serve the space.

- **Secondary power for fire alarms.** Refer to NFPA 72 Section 10.6.7 for duration and quantity of secondary power.
- **Time delay.** NEC 700.12(B) (1) requires that the generator have a 15-minute time delay before transferring to normal power after normal power is restored.
- **Power sources for fire pumps.** NFPA 20 Section 9.6.2.1 requires power sources to comply with Section 6.4 and meet the requirements of Level 1, Type 10, Class X systems of NFPA 110, Standard for Emergency and Standby Power Systems. See IBC Table 2702 for generator run times.
- **Load Calculations.** When submitting for the electrical permit, size the generator for sequenced starting loads.

Smoke Control

- **A separate permit** is required for smoke control systems (FH permit).
- **Smoke removal is not required** where smoke-proof enclosures are provided. Contact your fire reviewer for verification of compliance with IBC 403.4.7 Item 3.
- **A smoke control system is required** per IBC 403.7 meeting the requirements in IBC 909 in all areas containing a Group I or R occupancy within high-rise buildings. Such areas shall be separated in accordance with IBC 709 & 909 to create separate smoke zones, or smoke control shall be provided in all such unseparated areas of the building.
- **Protection of equipment, control wiring, power wiring and ductwork** for smoke-proof enclosures and pressurized elevator hoistways shall be in accordance with IBC 909.20.7.1 and 909.21.3. Wiring for stairwell pressurization systems may be included in the same raceway, cable, box, or cabinet with other emergency NEC 700 system feeders only up to the first distribution point after the emergency transfer switch in accordance with Bellevue Fire Department [Smoke Control Guidelines](#). Wiring for the fire alarm systems shall meet the requirements of NFPA 72 on survivability.
- **Smoke control systems** must be designed in accordance with IBC 909 and the Bellevue Fire Department [Smoke Control Guidelines](#), which includes many details, and standard features applicable to the smoke control panel and procedures applicable to the special inspector.
- **Smoke control permit timing.** Permit application and approval timing is as follows:

The [Smoke Control Concept \(Appendix A\)](#) must be approved prior to submittal of the below-grade-garage building permit (Major Building Permit for garage).

The [Smoke Control Detailed Design \(Appendix B\)](#) must be submitted prior to issuance of the below grade garage building permit (Major Building Permit for garage).

The [Smoke Control Permit](#) must be approved before the above-grade building permit (Major Building Permit for podium/building) will be issued.

Work associated with the smoke control permit, except for a slab-only pre-wire, cannot occur until the smoke control permit is issued. An electrical pre-construction meeting is required before a garage slab-only permit is issued.

See [Egress and Shafts](#), [Atriums](#) and [Elevators](#) for additional smoke control requirements.

Hazardous Materials

- **The location, quantity and use of hazardous materials** need to be clearly identified on the drawings for each control area. For example, IBC Table 307.1(1) limits Class II combustibles in storage to 120 gallons. This can be increased to 240 gallons in a sprinklered building then again to 480 gallons if stored in approved storage cabinets or as otherwise noted in this table. If not planned for, significant operational difficulties may be encountered.
- **H-occupancy classifications.** Refer to IBC 307.1.1 for exceptions to H-occupancy classifications.
- **Stationary storage battery systems.** Refer to IBC 307.1.1 Item 9, IBC Table 307.1(2), IFC 608, NEC 700.12(A), IMC 502.4 and IMC 510.2.
- **Areas occupied for storage of hazardous materials** must be provided with a means to control spillage and provide secondary containment of drain-off spillage and fire protection water per IBC 414.5.3 & IFC 5004.2.

Transformer Vaults

Oil-filled Transformers

- **Sprinklers.** Transformer vaults are required to be sprinklered when located within the building per IFC 102.8 and 901.4.4.
- **Location.** Identify the location of all transformer vaults. Per NEC 450.41, vaults must be located where they can be ventilated to the outside air without using flues or ducts wherever such an arrangement is practicable. If not practicable, this must be approved by the Building Official and Fire Code Official.
- **Construction of walls, roofs and floors.** The walls and roofs of vaults shall be constructed of materials that have adequate structural strength for the

conditions with a minimum fire resistance of 3 hours per NEC 450.42. The floors of vaults in contact with the earth must be constructed with a minimum of 4-inch-thick concrete, but where the vault is constructed with a vacant space or other stories below it, the floor shall have adequate structural strength for the load imposed thereon and a minimum fire resistance of 3 hours (6-inch minimum concrete). Where transformers are protected with an automatic sprinkler system and installed five stories or less above finished grade, the fire resistance rating is permitted to be reduced to 1-hour (remember shafts penetrating a 2-hour floor would still require the 2-hour rating per IBC 713.4). Studs and wallboard construction are not acceptable (except at shafts leading away from the vault). Refer to NEC 450.42 and the Washington Cities Electrical Code for additional information.

- **Doorways.** Vault doorways shall be protected in accordance with NEC 450.43(A), (B) and (C). Door assemblies must have a 3-hour rating and locks (1-hour rating would be appropriate if the vault is one hour). IBC 716.2.8 requires an automatic-closing device to be provided when utilizing a rolling fire shutter. Personnel doors must swing out and be equipped with panic bars, pressure plates, or other devices that are normally latched but open under simple pressure.
- **Spill control and secondary containment.** A doorsill or curb that is of an approved height that will confine the oil from the largest transformer within the vault shall be provided, and in no case shall the height be less than 100 mm (4 in.). Vaults containing a transformer(s) larger than 100 kVA capacity shall be provided with a drain or other means that will carry off any accumulation of oil or water in the vault. Where local conditions prevent a drain from being installed, other approved means may be used. The floor shall be pitched to the drain where provided. Indicate capacity of vaults. Areas occupied for storage of hazardous materials must be provided with a means to control spillage and provide secondary containment of drain-off spillage and fire protection water per IBC 414.5.3 & IFC 5004.2.
- **Ventilation openings.** Openings for ventilation shall be provided in accordance with NEC 450.45(A) through (F). Refer to these code sections for requirements for location of ventilation openings, arrangement of openings, and size of ventilation openings, covering limitations over openings, dampers, and ducts. Exhaust ventilation openings are not permitted to be dampered.
- **Water pipes and accessories.** Any pipe or duct system foreign to the electrical installation must not enter or pass through a transformer vault per NEC 450.47. Piping or other facilities provided for vault fire protection or for transformer cooling would not be considered foreign to the electrical installation.
- **Storage in Vaults.** Materials shall not be stored in transformer vaults per NEC 450.48.

Dry Transformers

Dry transformers rated over 112.5 kVA. 1-hour construction and 1-hour doors are required at the transformer room per NEC 450.21(B) unless a Class 155 or higher insulation rating of the transformer is provided in lieu of the 1-hour rated construction.

Structural Requirements

- **Structural Plans.** Drawings should contain information as noted in IBC Section 1603. See WABO/SEAW White Paper #4, Structural Permit Submittal Guidelines, for recommended best practices for submittal of construction documents.
- **Structural Calculations.** See WABO/SEAW White Paper #4, Structural Permit Submittal Guidelines, for suggested guide for the format and content of the structural calculations.
- **Geotechnical Report.** The geotechnical report shall contain information as noted in IBC Section 1803. See City of Bellevue Geotechnical Report & Stability Analysis Requirements.

- **Statement of Special Inspections.** The applicant shall submit a statement of special inspections in accordance with BCC 23.05.105(A) as a condition for permit issuance. This statement shall be in accordance with Section 1704.3. The following information shall be identified in the statement per Section 1704.3.2:

Describe the seismic-force-resisting system (ASCE 7-16 Section 12.2.1)

Describe the designated seismic system (ASCE 7-16 Section 13.1.3). Special seismic certification shall be provided for components noted in ASCE 7-16 Section 13.2.2.

For more information, review the [2018 International Building Code Construction Bulletin](#).

- **Structural Observations.** Structural observations shall be provided per IBC Section 1704.6. The structural observer shall submit to the building official a written statement identifying the frequency and extent of structural observations.
- **Incorporation of Basin Effects.** Consistent with the City of Seattle Department of Construction and Inspections (SDCI) requirements, all building designs utilizing site specific ground motions procedures shall incorporate basin effects. See City of Bellevue Policy Document for Seismic Basin Amplification Factor.
- **Increased Structural Height Limit.** Buildings with structural height exceeding 160 ft shall comply with IBC Section 1613.4 Washington State Building Code Amendments. Effective on July 1, 2019.

- **Structural Height Limit.** The City of Bellevue does not follow the City of Seattle Director's Rule 5-2015 which allows the maximum structural height of a prescriptively designed Special Reinforced Concrete Shear Wall (SRCSW) to increase from 240 feet to 265 feet without engaging a Performance-Based Design Process.
- **Seismic design for nonstructural components.** Provide design for the support and attachment of architectural, mechanical, and electrical components per ASCE Ch. 13. Refer to IBC 1705.12.5 and 1705.12.6 for special inspection requirements. These components must be designed by a registered design professional. Special seismic certification may be required for components that are part of the designated seismic system per ASCE 7-16 Section 13.1.3. If the seismic anchorage design is to be submitted as a deferred submittal, this must be listed on the drawings per BCC 23.05.105(E).
- **Solar Readiness.** Where solar readiness is provided or required per WSEC Section C411, the as-designed dead load and live load for the solar zone shall be clearly marked on the record drawings and shall accommodate future photovoltaic system arrays at an assumed dead load of minimum of 4 pounds per square foot in addition to other required live and dead loads. A location for future inverters shall be designated either within or adjacent to the solar zone, with a minimum area of 2 square feet for each 1000 square feet of solar zone area and shall accommodate an assumed deadload of 175 pounds per square foot. Where photovoltaic systems are installed in the solar zone, structural analysis shall be based upon calculated loads, not upon these assumed loads.
- **Special loads.** Plaza levels may be required to support fire truck outrigger loads when determined to be necessary by the Fire Department. Design loading conditions are required to meet the requirements of the Vehicle, Fire Truck, and Apparatus Loading handout. Contact a structural plans examiner with the building division for additional design information. For more information, review the [Vehicle, Fire Truck, and Apparatus Loading](#) handout.
- **Performance-Based Design.** Buildings with a structural system not covered by or exceeding the structural system limitations of ASCE 7-16 Table 12.2-1 are required to undergo a Performance-Based Design process and will require a peer review.

Mechanical and Electrical

Separate permits are required for electrical, mechanical and plumbing installations.

- **HVAC system.** Describe the building HVAC system. Identify location and number of fans.

- **Pressurization.** Describe the elevator and stair pressurization system, including location of intake, exhaust, and fans. Show the location and extent of each pressurized elevator and stair per IMC 513.
- **Supply air at corridors.** Describe any system that supplies air to or from rated corridors.
- **Hoods.** Describe the exhaust system for any Type I cooking hood anticipated in the project. Include fire separations and termination locations.
- **Electrical vaults.** Describe the mechanical system for any electrical vault including supply and exhaust, fire separations and locations. Describe vault gravity vent to exterior. Show drain required per NEC 450.46.
- **Electrical switchgear rooms** may require a rated room per NEC 450.21(B).
- **Survivability issues.** Describe how the voice messaging circuitry (NFPA 72 requires two-hour protection) and smoke control riser are protected from a general fault during an incident in one zone.