



## 2009 HIGH-RISE CHECKLIST

January 2011

This checklist is intended for use to prepare for pre-development services meetings and to serve as a design and review aid for high-rise buildings as described in 2009 International Building Code (IBC) 403. Please note that there are several City of Bellevue (COB) amendments to the high-rise provisions in the IBC. COB Ordinance 5951 modifies the IBC and Ordinance 5952 modifies the International Fire Code (IFC). This checklist applies to the applicable codes as part of the Washington State Building Code as adopted and amended by the COB; refer to Bellevue City Code (BCC), Title 23. This checklist primarily addresses the 2009 IBC, 2009 IFC, includes the standards of the National Fire Protection Association (NFPA) as specifically referenced in the IFC, 2008 National Electrical Code (NEC), and American Society of Civil Engineers (ASCE) 7-05. This checklist is only a general list and is not intended to address all possible conditions.

### General Building Code Requirements

- List basic code information** such as number of stories & basements, building address (s), etc.
- 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 can apply. These devices are required by IFC and Bellevue Fire Department Development Standards (BFDDS) in all high rises. Refer to modifications to this section in BCC 403.2.1.1. In some cases, a reduction of the type of construction is not permitted.
- Multiple buildings above Group S-2 parking garages** shall comply with IBC 509.9.
- Show the distance to property lines** and to the centerline of public ways per IBC Table 602.
- Emergency escape and rescue openings** required by IBC 1029 are not required per IBC 403.5.6.
- For underground buildings**, refer to BCC 405.1 and standby power requirements in BCC 405.8. Stairways serving floor levels more than 30' below grade must be pressurized in accordance with IBC 405.1, exception 2.
- 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% of public entrances shall be accessible. Show locations of all accessible parking spaces, van 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 1007. The locations of audible and visible alarms should be on the drawings per IBC 907.5.2. Accessibility detailing must meet the standards of ICC/ANSI A117.1-2003.
- 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; firestopping; 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, emergency power, 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, and plumbing work.
- Fire-resistant joint systems.** Protection needs to be provided at joints between rated walls, floors, and roofs per IBC 714.1 and at the void created at the intersection of a floor/ceiling assembly and an exterior curtain wall assembly per IBC 714.4. Specific approved assemblies should be referenced on the drawings unless specifically listed as a deferred submittal.
- Fireblocking.** 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 717.2.3. Curtain walls should have fire blocking details as well. If addressed as a deferred submittal, this needs to be specified on the drawings.

- Fire-resistive assemblies** need to be specifically identified on the drawings by hourly rating, testing agency, and assembly reference number. In addition, all materials and components as well as connection information needs to be called out on the drawings for each assembly used.
- Sprayed fire-resistant material (SFRM)** shall comply with IBC 704.13 and Table 403.2.4.
- Fire walls/barriers/partitions and smoke/barriers/partitions** shall be identified per IBC 703.6
- Pedestrian protection** must be provided per IBC 3306. A Right-of-Way Use Permit may be required if work impacts the public way.
- 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, window sills of operable windows located more than 72" above the finished grade must be a **minimum of 24" above** the finished floor per IBC 1405.13.2.
- Yards.** Yards adjacent to exterior walls that provide natural light and ventilation cannot be less than 3 feet for 1- and 2-story buildings. For taller buildings, yards must be increased at the rate of 1' for each additional story (up to 15' max.) per IBC 1206.2.
- 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 schedule.** A complete door schedule must be provided which includes detailed hardware information to address special egress-control devices, closers, smoke protection, fire-resistance ratings, etc.

## Egress and Shafts

- Provide an egress plan.** Show exits, separation of exits or exit-access doorways per IBC 1015.2, travel distance calculations per IBC 1016, corridors, stair enclosures, floor areas per occupancy per floor, etc.
- Additional exit stairway maybe required.** IBC 403.5.2
- Fire service access elevator.** 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 one fire service access elevator shall be provided in accordance with Section 3007.
- 403.5.5 Luminous egress path markings.** Luminous egress path markings shall be provided in accordance with Section 1024.
- Exit width** must be calculated per IBC 1005.1.
- 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 two floors per IBC 1004.5.
- Exit signs** must be provided per IBC 1011.1. Tactile exit signs are also required to be provided per IBC 1011.3 in conformance with 2003 ICC/ANSI A117.1.
- The common path of egress travel** needs to be considered per IBC 1014.3. This should be carefully considered for future tenant improvement layouts.
- Stair pressurization or smokeproof enclosures.** IBC 1022.9, each exit that serves stories where the floor is more than 75 feet above the lowest level of fire department vehicle access or more than 30 feet below the level of exit discharge shall be a smokeproof enclosure or pressurized stairway in accordance with IBC 909.20. As supported by IFC 901.4.3, additional stair enclosures in parking garages may be required to be pressurized. Identify each pressurized stair and the extent of each on the drawings.
- Elevator Shaft pressurization,** when provided, shall comply with IBC 708.14.2.1 and 909.6.
- 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 508.1.5, 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 required 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.

- **Stairway to roof.** One stairway must extend to the roof per IBC 1009.13. If the other stairway does not continue to the roof, a hatch must be provided unless the required standpipe is extended per IFC 905.4, as amended in BCC 23.11.905.4.
- **Roof hatches** must be a minimum of 16 sq. with a minimum dimension of 3 feet per IBC 1009.13.1 and COB Fire Department development standards.
- **Special doors** or doors with controlled access must be identified. Refer to IBC 1008.1.4.
- **Supply and exhaust shafts in parking garages** that are separated from other building shafts by not less than 2-hour fire-resistance-rated construction are not required to have fire/smoke dampers per IBC 716.5.3, Exception 1, note 1.4.
- **Means of egress illumination.** Egress pathway lighting in parking garages must have an average of 1 foot-candle and a minimum at any point of 0.1 foot-candle at the path of travel at the floor level leading to each exit per IBC 1006.4.
- **Doors serving electrical rooms** with equipment rated 1,200 amperes or more and over 6' wide that contain over-current devices shall swing in the direction of travel and be provided with panic hardware. A second exit or exit access door may be required. See IBC 1008.1.10 and NEC 110.26 (C) #2.

### Atriums

- **Smoke control** is required for atriums per IBC 404.5 except for atriums that connect only 2 stories.
- **Identify all required separations** from adjacent spaces by a 1-hour fire barrier wall per IBC 404.6. Indicate if using the exception for a sprinklered glass wall, 3/4-hour glass block assemblies, or the adjacent spaces of any three floors of the atrium shall not be required to be separated from the atrium where such spaces are 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. In other than the lowest level of the atrium, where the required means of egress is through the atrium space, the portion of exit access travel distance within the atrium space shall not exceed 200 feet. Travel distance requirements for areas of buildings open to the atrium and where access to the exits is not through the atrium, shall comply with the requirements of Section 1016. IBC 404.9.

### Sprinkler System & Standpipes

- **A sprinkler system is required** per BCC/IFC 903.3.1.1.2. The type and extent needs to be noted on the drawings.
- **Secondary water source.** A secondary water supply is required for high rise buildings per BCC/IFC 903.3.5.2, as amended. The definition of water supply includes both the water reservoir and the ability to pump it to the roof. Therefore a separate pump associated with the reservoir is required. The reservoir must be sized in accordance with IFC 903.3.5.2 and must comply with NFPA-22 (Water Tanks) and be equipped with an automatic fill assembly that will refill the tank within 4 hours.
- **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 or 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 as required by the 2010 edition of NFPA-13 per IBC 1613 and ASCE 13.6.8.3.
- **Class I wet standpipes** are required to be provided per IFC 905.3.1, BCC/IFC 905.3.1, and BCC/IFC 905.3.8. 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 BCC/IFC 905.4.
- **Hose reach requirements.** Per IFC 905.4 Item 6, all standpipe connections must be within a protected enclosure (pressurized stair) except when located at a horizontal exit. Standpipes must be located at intermediate landings within pressurized stairs. The maximum hose reach length is 150 feet from the standpipe to all occupiable spaces within the building measured along the actual path of travel.
- **Standpipe systems during construction** shall be provided per IBC 3311 and IFC Chapter 14.

- **Cable trays and bundles in non sprinklered spaces.** Non-combustible ceiling or floor cavities and similar spaces must be sprinklered unless they meet the requirements of NFPA 13-2010 Section 8.15.1.2 Concealed Spaces Not Requiring Sprinkler Protection.
- **Loading docks.** Covered or below grade loading docks shall be protected as Extra Hazard Group 1, having a minimum design of 0.29 gpm/sqft over 3,250 square foot area (dry system area).
- **Two fire department connections** are required for each high-rise building. Fire department connections shall be installed in accordance with NFPA 14- 2010 as adopted by City of Bellevue Ordinance, and shall comply with IFC Sections 903.3.1, 903.3.7, 905, and 912. Fire department connections must be facing the street.
- **Floor control valves.** Approved supervised indicating control valves shall be provided on each floor in accordance with Amended IFC 903.4.3, so that an individual floor may be isolated without impairing additional floors (see 2 exceptions).
- **Garage sprinkler systems.** Where more than two levels of parking are provided, separate dry systems will be required to meet the above noted floor control valve requirement,
- **Dry Standpipes.** 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 Pumps in High-Rise Buildings** shall comply with NEC 695, IFC 913, and NFPA 20- 2010. The fire pumps (primary and secondary) must be sized to meet the sprinkler and hose demand as prescribed in BCC/IFC 905.3.8.

### Fire Alarm and Detection Systems

- **Emergency systems.** The detection, alarm and emergency systems of high-rise buildings shall comply with Sections IBC 403.4.1 through 403.4.8 and NEC article 695 & 700.
- **The location of the fire command center(s)** needs to be shown on the drawings per IBC 403.4.5. The command center must comply with IFC 508 as amended and be approved by the Fire Department. IFC 508 describes the requirements of the fire command center and includes a requirement for a 2-hour fire-resistance-rated fire barrier to separate it from the rest of the building. The fire command center shall have direct exterior access.
- **Fire Alarm systems** shall be provided in accordance with IFC 907, Chapter 8 of the BFDDS, and NFPA 72 – 2010 edition. In particular:
  - Automatic smoke detection shall be provided per IFC 907.2.13, and connected to the Fire Alarm system.
  - Floor control valves must be supervised per BCC/IFC 903.4.3.
  - Wiring for the fire alarm systems shall meet the requirements of NFPA 72 with regards to Survivability, and IBC 909.20.6 as relates to shaft pressurization control wiring.
- **Specific provisions for occupancy types** need to be addressed per IFC 907.
- **Alarms and communication.** High-rise buildings are to be provided with an automatic fire alarm system and emergency voice/alarm communication system per BCC/IFC 907.2.13.2. The emergency voice messaging system shall be provided per Bellevue Fire Department requirements and the type of system specified.
- **Occupant notification system** shall be provided per BCC/IFC 907.6.
- **Automatic fire detection.** Smoke detectors are to be provided per IFC 907.2.13. Smoke detectors must be connected to an automatic fire alarm system. The activation of any detector shall operate the emergency voice/alarm communication system.
- **Fire department communication system.** Per IFC 907.2.13.2, a wired communication system is required in addition to the emergency responder radio system required in BCC/IFC 510.
- **Elevator lobbies,** if provided on garage levels, must have smoke detection for recall.
- **Battery (UPS) rooms.** Identify any locations where there are battery rooms. Provide an approved automatic smoke detection system in areas containing stationary lead-acid battery systems having liquid capacity of more than 50 gallons. The detection system must be supervised per IFC 907.2.23. Full compliance with IFC 608 is required regarding ventilation of UPS rooms. Refer to City of Bellevue handout. (need to identify handout #)
- **Building radio coverage.** BCC/IFC 510 details the requirements for emergency responder radio coverage. Radio coverage must meet the requirements of this section and be field tested. (800 mega Hertz)

- **Fire extinguishers** must be provided per IFC 906.1.

## Elevators

- **Elevator lobbies** shall comply with IBC 403.6 and BCC 708.14.1.
- **Standby power** is required for elevators in accordance with IBC Chapter 27, IBC Section 3003 and shall comply with BCC Table 403(1) & NEC article 620 & 700.
- **Specify rating of shafts and opening protective** per IBC 708. The rating of elevator doors must be per IBC 715.4.3.
- **Number of elevator cars in a hoistway.** Separate hoistways are required where four or more elevator cars serve all or the same portion of a building. Not more than four elevator cars shall be located in any single hoistway enclosure per IBC 3002.2.
- **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 1007.4. If emergency signage is to be a deferred submittal, this needs to be listed on the drawings per BCC 23.05.105(E).
- **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 BCC 3002.4. Identify these elevators for each tower proposed to show that all floors are served.
- **Accessible means of egress.** IBC 1007.2.1 requires at least one elevator to comply with IBC 1007.4 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 1007.4 requires emergency operation, signaling devices, and standby power.
- **Hoistway venting** is required per IBC 3004.1 unless the shaft is pressurized per BCC 708.14.2.1. See also WSBC 708.14.2.12.
- **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. Refer to IBC 3006.2.
- **Machine rooms and machinery spaces.** Per IBC 3006.4, elevator machine rooms and machinery spaces must be enclosed with construction having a fire-resistance rating not less than the required rating of the hoistway enclosure served by the machinery. Openings must be protected with assemblies having a fire-resistance rating not less than that required for the hoistway enclosure doors. Machine rooms cannot open directly onto vertical exit enclosures per IBC 1022.3.

## Standby Power and Emergency Power Systems

- **Where required.** Refer to IBC 403.4.7 and 403.4.8 for a list of the required locations that must be supported by emergency and standby power systems. These must be maintained and tested in accordance with the IFC. Refer to IBC Table 403(1) per BCC 23.10.403 for equipment on standby and emergency power as well as run times.
- **Elevator standby power.** The operation of elevator standby power must be in accordance with IBC 3003.1.1 through 3003.1.4 and NEC 620 & 700.
- **An approved remote fueling station** is required at an approved location per IFC 3404.2.7.5.2.
- **Stationary generators.** Emergency and standby power generators shall be listed in accordance with UL 2200 per IBC 2702.1.1 and NEC 110.3 & 700.3.
- **Fuel-fired emergency generator sets** and associated fuel storage, including optional generator sets, located more than 75 feet above the lowest level of Fire Department vehicle access requires the approval of the Fire Code Official per COB IFC 604.214.1 and BCC 403.4.8.1.
- **Rated separation and Ventilation.** If the standby system is a generator set inside a building to support a smoke-control system, the standby system, including the automatic transfer switch, must be located in a separate room enclosed with 2-hour fire-resistance-rated fire barrier assemblies. Ventilation directly to the outside must be provided from the generator room. Refer to BCC 403.4.7.1 and 909.11.
- **System supervision** with manual start and transfer features must be provided at the fire command center. IFC 509.
- **Other equipment.** NFPA 110 Section 5-2.2 prohibits the installation of any other electrical equipment within generator rooms.

- **Secondary power for fire alarms.** NFPA 72 Section 1-5.2.6 requires 24-hour stand-by power for Central Station type systems with 5-minute ring time left at the end and 60-hour stand-by power for Remote Station systems, again with 5-minute ring time. Both systems require loads sufficient at the end of the time allotment to run Emergency Voice Alarm Communication System (EVACS) for 2 hours in an emergency (operating selective page-call) or 15 minutes at full load (all page zones simultaneously).
- **Generators and UPS.** NFPA 72 Section 1-5.2.7 allows the use of a generator for stand-by power provided a UPS is installed to not allow loss of signals during the start of the generator.
- **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.
- **Onsite fuel supply** must be provided per NEC 700.12(B) (1).
- **Power sources.** 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 BCC Table 403(1) for generator run times.
- **Load Calculations.** When submitting for the electrical permit, size the generator for sequenced starting loads.

### Smoke Control

- A smoke control system that complies with IBC 909 and the BFDDS must be provided. A Smoke Control system is required for high rise buildings (IBC 403.1) and Atriums (IBC 404.4).
- A separate permit is required for a smoke control system. Submittal requirements are detailed in Chapter 11 of the BFDDS and Number Sheet 42. Drawings must include all zones, all required equipment, definitions of fans and dampers, positive indication supervisory switches, wiring in raceways, a listed smoke control panel (SCP), and a smoke control functional matrix. Note that the BFDDS include many details and standard features applicable to the Smoke Control Panel and procedures applicable to the Special Inspector.
- **Permit Timing.** The smoke-control concept (see number sheet 42A) must be approved prior to submittal of the garage building permit (BB for the garage). The smoke control detailed design (see numbered sheet 42B) must be submitted prior to issuance of the garage building permit (BB for the garage). The smoke control permit (FH detailed design see number sheet 42B) must be approved before the above grade building permit (BB for podium/tower) will be issued.
- **Loading docks.** Smoke removal for the loading dock area within a building must have an exhaust volume of 10 air changes per hour. Fans for truck loading bay must be on emergency generator.
- **Fire-resistance rating for protection of smoke-control system.** Shaft pressurization equipment, control wiring, power wiring, and ductwork for stair and elevator shaft pressurization must be separated from the remainder of the building and other equipment with a 2-hour fire barrier per IBC 909.20.6.1, as amended in BCC 23.10.909.20.6.1.
- **Special inspection for smoke control.** Smoke control systems shall be tested by a special inspector per IBC 1704.14 & IFC 909.18. Refer to the COB document entitled Special Inspector Requirements for Smoke Control/Management Systems.
- **Requirements for Electrical Smoke Control Plans** handout should be referred to in preparation for electrical plan review of the smoke-control system.
- Pressurization of all stairways leading into a parking garage that descend more than 30 ft. below grade is required, as well as pressurization of any pressurized stair tower above grade that extends below grade, and the reverse combination.

### 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 combustible liquids 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 for exceptions to H-occupancy classifications.
- **For batteries utilized for facility emergency power,** refer to IBC 307.1, Item 9; IBC Table 307.1(2), IFC 608 and NEC 700.12(A).

## Transformer Vaults

### Oil-filled Transformers:

- Sprinklers.** Transformer vaults are required to be sprinklered when exterior access is not provided per IFC 102.8 and 901.4.3.
- 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" 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" minimum concrete). Studs and wallboard construction is not acceptable (except at shafts leading away from the vault). Refer to NEC 450.42 for additional information and for an option for using a 1-hour rating when sprinklered (remember shafts penetrating a 2-hour floor would still require the 2-hour rating per IBC 707.4).
- Doorways.** Vault doorways shall be protected in accordance with NEC 450.43(A), (B), and (C). Doors must have a 3-hour rating and locks (1 hour rating would be appropriate if the vault is one hour). IBC 715.4.10 requires an automatic-closing device to be provided when utilizing a rolling fire shutter. Unless providing drains and approved by PSE, a sill or curb to confine oil from the largest transformer in the vault (but not less than 4") may be required. 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.** 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 414.5.5 & IFC 2704.2.
- Ventilation openings.** Where required by NEC 450.9, 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. One-hour construction and one-hour doors are required at the transformer room per NEC 450.21(B).

## Structural Requirements

- The Seismic Design Category** must be specified per IBC 1613.5.6 along with the Occupancy Category per IBC Table 1604.5.
- Fire-resistive protection** of structural components must be specified on the drawings.
- Seismic-force-resisting system.** For concrete shear wall buildings, determine if the seismic-force-resisting system is to be considered a bearing wall system or a building frame system. Refer to ASCE 12.2.
- 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 1707.5, 1707.6 and 1707.7 for special inspection requirements. These components must be designed by a structural engineer. 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).
- A statement of special inspection** must be prepared by the registered design professional in responsible charge in accordance with IBC 1705.

- Special inspections** must be provided as required in IBC 1704 and include special materials and systems utilized in the building per IBC 1704.15 and special inspections for seismic resistance as outlined in IBC 1707.
- Structural observation** is required per IBC 1710.1.
- 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 COB handout entitled Vehicle, Fire Truck, and Apparatus Loading (Handout B-1). Contact a structural Plans Examiner with the Building Division for additional design information.
- A clear headroom height of 7 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, drain pipes, etc. must be considered.

#### **Mechanical and Electrical** *(Separate permits are required for MEP 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.
- 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.
- Electrical switchgear rooms** may require a rated room per NEC 450.21(B).
- Survivability issues.** Describe how the voice messaging circuitry (NFPA-72 requires 2-hr protection) and smoke control riser is protected from a general fault during an incident in one zone.

#### **COB Handouts Referenced in the Checklist** *(reference to heading in this document)*

- Alternate Materials, Methods, or Modifications Request Form.** *(Gen. Bldg Code Requirements)*
- Fire Pumps on High Rise Buildings.** *(Sprinkler System & Standpipes)*
- Conceptual Smoke Control Submittal #42A.** *(Smoke Control)*
- Special Inspector Requirements for Smoke Control/Management Systems.** *(Smoke Control)*
- Requirements for Electrical Smoke Control Plans.** *(Smoke Control)*
- Pressurization/Ventilation Equipment Serving Smokeproof Enclosures.** *(Smoke Control)*
- Structural Slab Design Loading** for plaza level designs. *(Structural Requirements)*