Commercial Plan Review and Correction List

City of Brentwood – Planning & Codes Dept – (615) 371-2204

(Revised July 31, 2013)

Project Reviewed by: _____

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Permit No. _____ 1st Review Date:_____ 2nd Review Date:_____

Name of Project: _____

Project Address: _____

☐ New Construction ☐ Addition ☐ Remodeling ☐ Tenant Build-Out Zoning_____

☐ Mixed Occupancy Primary _____

IBC Occupancy

☐ Assembly A	☐ A-1 ☐ A-2 ☐ A-3 ☐ A-4 ☐A-5
☐ Business B	
☐ Educational E	
☐ Factory F	☐ F-1 ☐ F-2
☐ High Hazard H	☐ H-1 ☐ H-2 ☐ H-3 ☐ H-4 ☐ H-5
☐ Institutional I	☐ I-1 ☐ I-2 ☐ I-3 ☐ I-4
☐ Mercantile M	
☐ Residential R	☐ R-1 ☐ R-2 ☐ R-3 ☐ R-4
☐ Storage	☐ S-1 ☐ S-2

NFPA Occupancy

☐ Assembly	Chapters 12 & 13
☐ Educational	Chapters 14 & 15
☐ Day Care	Chapters 16 & 17
☐ Healthcare	Chapters 18 & 19
☐ Ambulatory Care	Chapters 20 & 21
☐ Correctional	Chapters 22 & 23
☐ 1&2-Family Dwelling	Chapters 24 & 25
☐ Lodging/ Rooming	Chapter 26
☐ Hotel & Dormitories	Chapters 28 & 29
☐ Apt Buildings	Chapters 30 & 31
☐ Resid. Bed & Care	Chapters 32 & 33
☐ Mercantile	Chapters 36 & 37
Mercantile Class	☐ M-A ☐ M-B ☐ M-C
☐ Business	Chapters 38 & 39
☐ Industrial	Chapter 40
☐ Storage	Chapter 42
☐ Other	

Building Area between Fire Walls

Basement	_____	_____
First	_____	_____
Second	_____	_____
Third	_____	_____
Fourth	_____	_____
Total	_____	_____

IBC Allowable Area Table 503 _____

IBC Maximum Allowable Area per Floor IBC 503, 506, 507 _____

IBC Allowable Number of Floors Table 503 _____

Tenant Area _____ **SF**

IBC Construction Type Table 601

☐ Type IA	☐ Type IB
☐ Type IIA	☐ Type IIB
☐ Type IIIA	☐ Type IIIB
☐ Type IVA	☐ Type IVB
☐ Type VA	☐ Type VB

☐ **Sprinklers** Yes ☐ No ☐

Occupancy Separation: Yes ☐ No ☐ NA ☐

_____ Hours

Brentwood, TN - Exterior Design Conditions IECC 302

Winter, Design:	Dry-bulb (F) **9 F**		**Interior MAX 72 F**	**NOTE: One method of meeting the Energy Compliance Statements is to use DOE's Comcheck EZ software and submit its report.**
Summer, Design:	Dry-bulb (F) **97 F**	Wet-bulb 78 **F**	**Interior MAX 75 F**	
Degree days:	Heating **3609**	Cooling **1552**		
Climate zone:	**4A**			

**** Plans have been reviewed for compliance with the 2012 International Building Code (IBC), 2012 International Mechanical Code (IMC), 2012 International Plumbing Code (IPC), 2012 International Fuel Gas Code (IFGC), 2009 International Energy Conservation Code (IECC), 2008 National Electrical Code (NEC NFPA 70), 2009 Life Safety Code (NFPA 101), 2009 Uniform Fire Code (NFPA 1), 2010 ADA Standards for Accessible Design & 2009 ICC/ANSI A117.1. The following list does not necessarily include all deficiencies. See additional items on the cover sheet.**

A.) PROCEDURES

Provide complete sets of plans covering improvements proposed. (civil, landscaping, life safety, structural, architectural, mechanical, plumbing, electrical and one copy of specifications)

- New commercial buildings, additions, foundation, exterior renovations or change of Occupancy Use requires plans completed by a design professional. (3 complete sets of plans; one set of specifications)
- Tenant finish, demolition, interior renovation, roof replacement, additional plumbing fixtures/improvements, new/additional mechanical equipment/ improvements and electrical fixture change-out/improvements requires plans to be completed by a design professional. (2 sets of drawings)

NOTE: The construction documents shall show in sufficient detail the location, construction, size and character of all portions of the means of egress including the path of the exit discharge.

State of Tennessee-Rule 0120-02-.08(8) allows the use of rubber-stamp, embossed, self-adhesive or electronically generated seals. The registrant may also affix an electronically generated signature and date of signature to documents, **provided that the registrant uses a secure method of affixation and does not authorize any other person to so affix the signature and date**.

- Only design professionals holding active Tennessee registration may submit plans and specifications for review to building departments and local planning and engineering offices.
- A Tennessee registrant may only apply his professional seal, signature and date of signature to those plans and specifications that were prepared by him or under his responsible charge.
- "Responsible charge" is defined in rule 0120-02-.08(6). The rules of the Board are available at http://www.tn.gov/sos/rules/0120/0120.htm. Provide two copies of plans and one copy of specifications, wet sealed (with signature and date) by a registrant in accordance with the Architects and Engineers Licensing Law Rules.

1. Pedestrians shall be protected during construction, remodeling and demolition activities. Signs shall be provided to direct pedestrian traffic. **[IBC 3306.1]** Required means of egress shall be maintained at all times during construction. **[IBC 3310.2]**

2. An approved water supply for fire protection, either temporary or permanent, shall be made available as soon as combustible material arrives on the site. **[IBC 3313]**

3. Prior to issuance of building permit approval the following shall be submitted:
3.1. Submit a copy of Notice of Coverage (NOC) for TDEC Storm Water Pollution Prevention to the City of Brentwood Engineering Department.
3.2. Submit a copy of the Tennessee State Fire Marshall's approval letter with any stipulations.
3.3. Submit a copy of the Tennessee Department of Health Division of Health Care Facilities' approval letter with any stipulations.

4. At the end of construction to obtain a ***Certificate of Occupancy*** or ***Certificate of Completion***, please provide the following:

4.1. Submit a copy of the initial backflow prevention tests for all devices installed meeting City of Brentwood standards.
4.2. IBC/106.1 Live loads posted. Where the live loads for which each floor or portion thereof of a commercial or industrial building is or has been designed to exceed 50 psf (2.40 kN/m2), such design live loads shall be conspicuously posted by the owner in that part of each story in which they apply, using durable signs. It shall be unlawful to remove or deface such notices.
4.3. Submit a copy of the Alarm System Inspection and Testing Report meeting the requirements of NFPA 72.
4.4. Submit a copy of the Contractor's Material and Test Certificate for Underground Piping meeting the requirements of NFPA 13.
4.5. Submit a copy of the Contractor's Material and Test Certificate for Aboveground Piping meeting the requirements of NFPA 13.
4.6. Submit a copy of the Contractor's Material and Test Certificate for Aboveground Piping for Standpipes meeting the requirements of NFPA 14.
4.7. Submit a copy of the Contractor's Material and Test Certificate for Private Fire Service Mains meeting the requirements of NFPA 24.
4.8. Submit a copy of the Pump Acceptance Test Data for a fire Pump meeting the requirements of NFPA 20.
4.9. Submit a copy of the Tennessee State Elevator Inspector's Approval.
4.10. Submit a copy of the Tennessee State Fire Marshall's Use and Occupancy permit.
4.11. Submit a copy of the Tennessee Department of Health Division of Health Care Facilities' release for licensure and occupancy.
4.12. Submit a final special inspection report documenting required special inspections and correction of any discrepancies noted in the inspections.

5. During construction provide to the building official the following special inspection reports: **[IBC 1704.2.4]**
5.1. The special inspector shall furnish inspection reports to the building official and licensed responsible design professional. Reports shall indicate that work inspected was done in conformance with the approved construction documents. Discrepancies shall be brought to the attention of the contractor and if the discrepancies are not corrected then the building official and licensed responsible design professional shall be notified.

6. Provide a statement of special inspections in accordance with **[IBC 1705 & 1704]**
6.1. Required Verification and Inspection of Steel Construction. **[IBC 1705.2, IBC Table 1705.2.2, Chapter 22]**
6.2. Required Verification and Inspection of Concrete Construction. **[IBC 1705.3, IBC Table 1705.3, Chapter 19]**
6.3. Required Verification and Inspection of Level 1 or 2 Masonry Construction. **[IBC 1705.4, Chapter 21]**
6.4. Required Verification and Inspection of Soils. **[IBC 1705.6,IBC Table 1705.6, Chapter 18]**
6.5. Required Verification and Inspection of Pile Foundations. **[IBC 1705.9]**
6.6. Required Verification and Inspection of Driven Deep Foundations.**[IBC 1705.7,Table 1705.7]**
6.7. Required Verification and Inspection of Cast-in-place Deep Foundations**.[1705.8, Table 1705.8]**
6.8. Required Verification and Inspection of Sprayed Fire Resistive Materials. **[IBC 1705.13]**
6.9. Required Verification and Inspection of Mastic & Intumescent Fire-resistant Coating**. [IBC 1705.14]**
6.10. Required Verification and Inspection of Seismic Resistance**. [IBC 1705.12]**

7. Provide a statement of require structural observations by a registered design professional in accordance with **IBC Section 1704**.

8. Provide on cover sheet of the plans for new and existing buildings:
8.1. List of Codes with edition dates.
8.2. Construction type, (un) protected, (un) sprinklered.
8.3. Occupancy type per **NFPA 101**.
8.4. Number of stories and height of building.
8.5. Area of building per **IBC Table 503** (new and existing). Calculate areas within IBC firewalls separately.
8.6. Show area increase calculations per **IBC 506**.
8.7. Include code references with edition dates.

8.8. Indicate occupant load of spaces.

8.9. Indicate mixed occupancy, or separated uses with separation requirement or non-separated uses with construction meeting the most stringent requirements**. [IBC 508.3.1, IBC 508.3.3, and NFPA 101 Table 6.1.14.4.1(a) & (b)].**

9. Information on the plan cover or data sheet is incorrect as follows:

_____

_____

_____

_____

10. For mercantile occupancies provide sub classifications:

10.1 Class A - All mercantile with aggregate gross area greater than 30,000 square feet or more than 3 stories for sales purposes. **[NFPA 101 36.1.4.2.1(1)]**

10.2 Class B - All mercantile with aggregate gross area greater than 3,000 square feet but less than 30,000 square feet, or less than 3 stories for sales purposes. All mercantile occupancies of not more than 3000 square feet gross area and occupying two or three stories for sales purposes. **[NFPA 101 36.1.4.2.1(2) (a) (b)]**

10.3 Class C - All mercantile with aggregate gross area less than 3,000 square feet occupying one story only**. [NFPA 101 36.1.4.2.1(3)]**

11. 2009 IECC/101.4.3 Additions, alterations, renovations or repairs:

Additions, alterations, renovations or repairs to an existing building, building system or portion thereof shall conform to the provisions of this code as they relate to new construction without requiring the unaltered portion(s) of the existing building or building system to comply with this code. Additions, alterations, renovations or repairs shall not create an unsafe or hazardous condition or overload existing building systems. An addition shall be deemed to comply with this code if the addition alone complies or if the existing building and addition comply with this code as a single building.

Exception: The following need not comply provided the energy use of the building is not increased:

1. Storm windows installed over existing fenestration.

2. Glass only replacements in an existing sash and frame.

3. Existing ceiling, wall or floor cavities exposed during construction provided that these cavities are filled with insulation.

4. Construction where the existing roof, wall or floor cavity is not exposed.

5. Reroofing for roofs where neither the sheathing nor the insulation is exposed. Roofs without insulation in the cavity and where the sheathing or insulation is exposed during reroofing shall be insulated either above or below the sheathing.

6. Replacement of existing doors that separate conditioned space from the exterior shall not require the installation of a vestibule or revolving door, provided, however, that an existing vestibule that separates a conditioned space from the exterior shall not be removed,

7. Alterations that replace less than 50 percent of the luminaires in a space provided that such alterations do not increase the installed interior lighting power.

8. Alterations that replace only the bulb and ballast within the existing luminaires in a space provided that the alteration does not increase the installed interior lighting power.

12. Construction documents for all buildings shall describe the exterior wall envelope in sufficient detail to determine compliance with this code.

11.2 Provide a Building Envelope Requirements with climate zone, insulation and fenestration

requirements noted. **[IECC Table 402.1.1]**

11.4 Provide Exterior and Interior HVAC Design Conditions**. [IECC 302]**

11.5 Provide required efficiency on equipment lists for mechanical and plumbing equipment. **[IECC IECC 403 and 404]**

11.6 Provide an Interior Lighting Power Allowance table for building occupancy. **[IECC Table 405.5.2]**

11.7 Provide a Lighting Power Density Table for Building Exterior. **[IECC Table 405.6.2]**

11.9 Provide Statement of Compliance for:

- Building Envelope. **[IECC 402]**
- Statement of Compliance for the Building Mechanical and Plumbing Systems**. [IECC 403 &IECC 404]**
- Statement of Compliance for the Lighting System. **[IECC 405]**
- **Building Envelope Requirements [IECC Section 402]**

13. Provide toilet fixture calculations per **IBC Table 2902.1 and IPC Table 403.1.**

14. Provide sprinkler design intent information as part of the code submittal package.

15. Complete sprinkler shop drawings and calculations shall be submitted for review and approval prior to installation. They shall be signed by a responsible managing employee, and submitted by a registered fire protection sprinkler contractor. Shop drawing information is generally a stipulation on the plans approval.

16. All piping from the "point of service" including underground used for sprinkler or standpipe system shall be installed by a registered sprinkler contractor. If there is an existing sprinkler system in the building a registered sprinkler contractor shall inspect, test, and provide a letter of acceptance for the existing system.

17. Provide complete fire alarm shop drawings and calculations shall be submitted for review and approval prior to installation. The alarm and detection shop drawings shall provide the information as outlined in **907.1.2 of the IBC.** The fire alarm contractor shall be certified in accordance with the Tennessee Alarm Contractors Licensing Act of 1991, TCA Title 62, and Chapter 32. Shop drawing information is generally a stipulation on the plans approval.

15.1 Horn/strobe devices shall be wired so that the strobe(s) continue to flash when the system is silenced. [City of Brentwood Fire Marshall's Office Policy based on NFPA 72 4.4.3.7]

15.2 If the fire alarm is only required to monitor the automatic sprinkler system place the required horn/strobe and manual pull station in a functional location. [City of Brentwood Fire Marshal's Office Policy]

18. Prior to installation provide two copies of structural shop drawings for pre-manufactured buildings to include manufacturer's name and model number or other designation. Send two (2) copies of structural drawings, stamped by a structural engineer, registered by the State of Tennessee. Show loading including seismic information per **IBC 1603.**

19. Provide the following flow test data on the plans for hydrant(s) used to meet the 500 feet or less hose lay requirement in accordance with the local authority having jurisdiction. <u>Show flow test data next to the hydrant tested</u>. Flow test shall have been conducted within the last six months.

- Flow and Pressure
- Static pressure _____ psi
- Residual pressure _____ psi (20 psi minimum)
- Flow _____ gpm **(1000 gpm minimum Brentwood local ordinance)**
- Party responsible for taking test (name and address)
- Date test taken: _____& Time test taken: _____ a.m. /p.m.
- Elevation of test hydrant:_____

20. Approval of tenant spaces will require submittal of the interior layouts and details for mechanical, plumbing, sprinkler layouts, and electrical systems, and information on fireplaces and chimney installation.

B.) GENERAL

1. **Provide design live load values (IBC Chapter 16) on plans (IBC Table 1607.1) for snow (IBC 1608), wind (IBC 1609), roof (IBC 1607.12), floor (IBC Table 1607.1), stairs (IBC Table 1607.1), guard and hand railings (IBC 1607.8), Rain Loads (IBC 1611), Seismic (IBC 1613), Seismic Use Group (IBC 1613), Seismic Design Category (IBC 1613.3.5) and Building Risk Category. (1604.5)**
   1.1. **Section 1603** Construction Documents
   1.1.1.1603.1.1 Floor Live Load (Indicate any reduction in accordance with **IBC 1607.10)**
   1.1.2.1603.1.2 Roof Live Load **[IBC 1607.12]**
   1.1.3.1603.1.3 Roof Snow Load P_g **[IBC 1608 & IBC Table 1608.2]** if P_g > 10 lb/sf then provide the following additional information.
   1.1.3.1. Flat-roof snow load, P_f.
   1.1.3.2. Snow exposure factor, C_e.
   1.1.3.3. Snow load importance factor, I_s.
   1.1.3.4. Thermal factor, C_t.
   1603.1.4 Wind design data. **[IBC 1609]**
   1.1.3.5. Basic wind speed (3-sec gust), MPH.
   1.1.3.6. Wind importance factor, I_w, and building occupancy category.
   1.1.3.7. Wind exposure.
   1.1.3.8. Applicable internal pressure coefficient.
   1.1.3.9. Components and cladding. Design wind pressure psf.
   1603.1.5 Earthquake design data.
   1.1.3.10. Seismic importance factor, I_E, and building occupancy category.
   1.1.3.11. Mapped spectral response accelerations S_s and S_1.
   1.1.3.12. Site class.
   1.1.3.13. Spectral response coefficients S_{DS}, and S_{D1}.
   1.1.3.14. Seismic design category.
   1.1.3.15. Basic seismic-force-resisting system(s).
   1.1.3.16. Design base shear.
   1.1.3.17. Seismic response coefficient(s), C_s.
   1.1.3.18. Response modification factor(s), R.
   1.1.3.19. Analysis procedure used.
   1603.1.7 Flood Design Data- Per City of Brentwood Flood Ordinance
   1603.1.8 Special Loads
   1603.1.9 Systems and components requiring special inspections for seismic resistance.
   1604 General Design Requirements.
   1603.3 **Live loads posted when design load exceeds 50 psf [2012 IBC/Section 106.1]**
   1607.8 Handrail, Guardrail, Grab Bar loading requirements

2. Provide two copies of structural shop drawings for pre-manufactured buildings to include manufacturer's name and model number or other designation. Send two copies of structural drawings, stamped by a structural engineer, registered by the State of Tennessee. Show loading including seismic information per **IBC 1603.1.5.**

3. Fire resistance-rated floor and roof assemblies shall be classified as restrained or unrestrained and identified as such on the plans. **[IBC 703.2.3 and NFPA 101 8.2.3.2]**

4. Identify use of rooms and spaces.

5. Provide door and door hardware schedule.

6. Provide glazing schedule. Specify size and type of glazing.

7. Provide interior finish schedule.

8. Provide a complete legend for _____.

9. Provide legend for all rated wall enclosures to identify specific ratings and their limits (i.e., Fire Wall **IBC 706**, Fire Barrier **IBC 707** and NFPA 101 8.3, Shaft Enclosures **IBC 713**, Fire Partitions **IBC 708**, Smoke Barriers **IBC 709** and **NFPA 101 8.5**, Smoke Partitions **IBC 710** and **NFPA 101 8.4** and, Horizontal Assemblies **IBC 711**, 0 minute smoke partition, 0.5- hour, one-, two-, three-, and four-hour ratings.

10. Show wall ratings on architectural, structural, mechanical, plumbing, electrical, and fire protection drawings.

11. Specify test number, hourly rating, and detail to include application instructions in their entirety on plans of firestop systems tested by a nationally recognized testing laboratory for each metallic and nonmetallic electrical, plumbing, HVAC piping and ductwork or conduit through fire resistive assemblies (e.g., U L Fire Resistance Directory, Section XHEZ, Factory Mutual, etc. tested in accordance with ASTM E-814 or ANSI/UL 1479) **or as acceptable to IBC 711, IBC 712, IBC 713, 714 and NFPA 101 8.3.5.1.**

C.) SITE

1. New and existing buildings shall be provided with approved address numbers or letters. **IBC 501.2**

2. Show location and footprint of all existing structures, property lines, grade elevations, water mains and other utilities, hydrants, fire department access, and all ingress/egress to public way. Include size and location of LP-Gas storage tanks (NFPA 58) and Flammable and Combustible Liquid Code (NFPA 30) [International Fuel Gas Code]

3. Site Accessibility

3.1. Each required means of egress must be continuous and accessible through to the public way including sidewalks, ramps, exit stairs, horizontal exits, etc. **[NFPA 101 7.5.4.3 and IBC 1007]**

3.2. Accessibility for existing buildings other than change of occupancy shall have no less than one accessible route. **[IBC 3411& ADA 206]**

3.3. Provide accessible routes within the site from public transportation stops, accessible parking and accessible passenger loading zones and public streets or sidewalks to the accessible building entrance**.[IBC 1104.1 & ADA 206.2.1]**

3.4. At least one accessible route shall connect accessible buildings, facilities, elements, spaces on the same site**.[IBC 1104.2 & ADA 206.2.2]**

3.5. At least one accessible route shall connect each accessible level including mezzanines, in multilevel buildings and facilities**.[IBC 1104.4& ADA 206.2.3]**

3.6. At least **60%** of all public entrances shall be accessible and the number of accessible entrances shall equal the number of required exits.**[IBC 1105.1]**

3.7. Exterior Ramps and Walks

3.7.1. The clear width of walks shall be 36 inches; straight run- between handrails. **[ADA 405.5]**

3.7.2. The slope of a walk may not exceed 5% (1 in 20 feet). If handrails are provided, the slope may be 8.33% (1 in 12 feet). The walk must have a continuous common surface not interrupted by steps or abrupt changes in grade level greater than ¼ inch. **[ADA 405]**

3.7.3. Walking surfaces may not have a cross slope greater than a 1:48 **[ADA 405.3]**

4. Parking **(Must comply to the City of Brentwood's parking requirements per Code of Ordinances)**

5. A supra lock box with a master key shall be provided at the main entrance of the building. **[NFPA 1 18.2.2.1]** More than one may be required.

6. Fire Department Access

6.1. Fire department access road shall be within 50 feet of at least one exterior door. **[NFPA 18.2.3.2]**

6.2. Fire department access roads shall be within 150 feet of when unsprinklered and 450 feet when sprinklered of any portion of the building. **[NFPA 1 18.2.3.2.2]**

6.3. Fire department access road shall be 20 feet wide with a 13 feet 6 inches minimum vertical clearance and a dead end cannot exceed 150 feet unless 50-foot turnaround is provided. **[NFPA 1 18.2.3.4.1]**

6.4. The building and/or the building monument sign shall have approved address numbers in a location that is plainly visible and legible from the street on which the building fronts. The numbers shall contrast with the background of the building or sign**. [NFPA 1 10.12.1**]

7. Fire Lines and Fire Hydrants

7.1. Fire hydrants shall be provided so that any portion of the building's exterior is within 500 feet hose lay of a hydrant measured along vehicle access route**. [State Fire Marshall Office Policy based on NFPA 1 ANNEX I Table I.3 and NFPA 24 4.2.2]**

7.2. Hydrants shall have at least a six-inch connection with the main. [NFPA 24 7.1.1]

7.3. Hydrants shall be properly supported. **[NFPA 24 10.8]**

7.4. **Private hydrants shall be painted yellow in accordance with the City of Brentwood Fire Marshal's Office.**

7.5. Fire hydrant locations for average conditions shall be installed at least 40-feet from the building to be protected. **[NFPA 24 7.2.3]**

6.6 In the Town Center district (C-4) underground fire hydrants with a 4 inch Stortz insert must be installed. Contact Brentwood water department for more information.

8. Provide the following information for fire service sprinkler protection on a site plan. **[NFPA 13 Chapter 10 and NFPA 24 Chapter 10]**

8.1. Identify the location and size of the city main at the sprinkler system tap. Show the location of the domestic water tap. Work from the Point of Service must be performed by a registered sprinkler contractor. Show the Point of Service on the plans. [TSFM Rule 0780-2-7-.08]

8.2. Provide details of the underground piping from the city main to the building identifying: line size and type (6" min., unless the requirements of **NFPA 13 23.1.3),** depth of bury (3 ft. min.), sectional valve locations, valve pit, and thrust block size and location, etc. [NFPA 24 Chapter 4 &10 and NFPA 13 Chapter 10]

8.3. Identify whether a reduced pressure backflow preventer or meter are present. If used, specify that this equipment must be listed for fire protection use. **[NFPA 13 8.16.1.1 and NFPA 24 5.3]**

8.4. The fire department connection must be on the street side of the building and be located and arranged so that a hose can be attached without interference from any objects, fences, posts, buildings, etc. [NFPA 24 5.9.5.2 and NFPA 13 17.2.1] See reference for exceptions.

8.5. In most situations, there must be a fire hydrant within 100 feet of the fire department connection. **[Brentwood Fire Marshal's Office Policy]**

8.6. Show existing fire hydrants and the distance to the proposed fire department connection. A fire hydrant may be required if the distance to the fire department connection is excessive or there is not an existing fire hydrant along the vehicle access route. **[Brentwood Fire Marshal's Office Policy]**

8.7. Show the fire pump and/or tank location and, if needed, the backup power source. Additional information must be provided, see the attached Fire Pump and/or Tank check list. **[NFPA 13 23.2.2, NFPA 23.2.3]**

8.8. A post indicator valve is required for fire protection supply lines. [NFPA 24 6.3] The PIV must be electronically supervised and should be located not less than 40 feet from the building. [IBC 903.4 and **NFPA 13 8.16.1.1.1]** See reference for exceptions.

8.9. In the Town Center district (C-4) underground pit valves can be utilized as the main shut off valve. Floor valves should be provided. Outside access to a dedicated riser room is preferred where possible. **[City of Brentwood Policy]**

8.10. Provide tamper switches at all underground valves installed in the pit. **[IBC 903.4]**

9. Fire Service mains must not run under buildings unless special precautions are taken. Provide details showing the method utilized (i.e., arched foundation walls, covered trenching, and isolation valves). [NFPA 24 10.6.2]

10. Provide a lead-in detail where the underground piping passes through the foundation and attaches to the riser. Provide clearance to prevent breakage of the piping due to building settlement. **[NFPA 13 10.6]**

11. Water supply for fire protection, either temporary or permanent shall be made available as soon as combustible materials accumulate. **[IBC 3313 and NFPA 1 16.4.3.1.1]**

12. Where underground water mains and hydrants are to be provided, they shall be installed, completed and in service prior to construction work**. [IBC 3313 and NFPA 1 16.4.3.1.3]**

13. Provide for testing and acceptance of underground fire piping in accordance with **NFPA 24 10.10.**

14. Dumpsters and containers with 1.5 cubic yards of capacity or more shall not be stored in buildings or placed within 10 feet of combustible walls, openings, or combustible roof eave lines. **[NFPA 1 19.2.1.4 & 19.2.1.4.2]**

15. Structures of Types I and II fire resistive construction used for dumpster storage shall be located not less than 10 feet from openings or other buildings**. [NFPA 1 19.2.1.4 & 19.2.1.4.2]**

D.) CONSTRUCTION

1. Building exceeds allowable area/number of stories/height for this type of construction and open space. **[IBC Table 503]** Show area increase calculations per **IBC 506.**

2. Show assumed property line between buildings and provide protection of facing walls and openings as per **IBC Table 602** and **IBC 704**, **Table 705.8**]

3. Columns, floors, roofs, exterior and interior (bearing and non-bearing) walls, and girders shall be protected in accordance with **IBC Table 601** for **Type I, II, III, IV, and V** Construction. (circle one)

4. Show what UL, other assembly number, or method is being used for the roof/ceiling and, floor/ceiling classified as restrained or unrestrained. **[IBC 703.2.3, NFPA 101 8.2.3.]** Specify that all component parts comply with tested assemblies.

5. Show what UL, other assembly number, or method is being used for the column protection. **[IBC 703, NFPA 101 8.2.3.]** Specify that all component parts comply with tested assemblies.

6. Walls and Partitions:

6.1. Fire Wall shall be two, three, or four-hour rated and shall be constructed in such a way that the wall will remain standing after the collapse of the structure on either side. **[IBC Table 503, IBC 706, IBC Table 706.4]** Wall shall extend minimum three feet above combustible roof. The fire wall shall extend not less than 18 inches past any combustible projection or extension.

6.2. Fire walls shall have sufficient structural stability under fire conditions to allow collapse of construction on either side without collapse of the wall for the duration of time indicated. [**IBC Table 706.4]** Project's structural engineer shall state **on the drawings that. . .** "**This wall is a two, three, or four hour rated fire resistant wall which extends continuously from the foundation to noncombustible) or through (combustible) the roof, with sufficient structural stability under fire conditions to allow collapse of the construction on either side without collapse of the wall.**" Provide details showing how wall is structurally independent at roof.

6.3. Show what UL, other assembly number, or method is being used for wall assemblies. **[IBC 703]** Specify that all component parts comply with tested assemblies.

6.4. Provide test number and test assembly detail for rated wall to fluted deck connections (head-of-wall joints). Or provide a detail of material tested (compliance report) for this application, or a design system detail proving the fire rating and smoke tightness. Provide certification letter from contractor after installation verifying compliance.

6.5. Show _____ hour fire resistance rating based upon fire separation distance. **[IBC Table 602]**

6.6. Show _____ hour separation between _____ and _____. **[IBC 508, and Table 508.4, Table 509, Table 706.4, Table 707.3.10, and 713]**

6.7. Rated walls shall extend tight against the underside of a roof or floor deck or to the underside of a rated smoke tight ceiling which has the same rating as the wall (e.g., two layers of 5/8 inch rated gypsum panels at the ceiling for one hour storage or janitor spaces and one or two hour rated walls turned horizontally and anchored to the walls for corridors, elevator and stair shaft ceilings [**IBC 706.6, IBC 707.5, NFPA 101 8.2.2.3, NFPA 101 8.4.2]** Provide appropriate details.

6.8. Fire walls , fire barriers, fire partitions, smoke barriers and smoke partitions or any other wall required to have protected openings or penetrations shall be effectively and permanently identified with signs or stenciling. **IBC 703.7**

6.9. Equipment recessed in a rated wall shall not decrease the rating of that wall. **[IBC 714.3.2]**

6.10 Construction in Type I and II building shall have partitions constructed of noncombustible or fire treated wood materials**. [IBC 603.]**

6.11 Exterior and interior walls with combustible construction shall be fire blocked at each floor, ceiling, and roof. **[IBC 718 and NFPA 101 8.6.10]**

6.12 Openings in exterior walls that are within 15 feet and above a neighboring combustible roof shall be equipped with approved opening protective. **[IBC 705.8.6]**

6.13 Projections extending beyond the exterior wall shall conform to the requirements of IBC 705 & Table 705.2.

7. Combustibles shall not be permitted in concealed spaces of Type I or Type II construction. **[IBC 718.5]**

8. Separation Requirements:

8.1. Every floor that separates stories shall be constructed as a smoke barrier or treated as an opening. **[IBC 711.3 and NFPA 101 8.6.1]**

8.2. Openings through floor ceiling assembly shall be enclosed with barrier walls. **[IBC 713.1 and NFPA 101 8.6.2]**

8.3. Garage/covered parking shall be separated from the office area by one-hour construction. [NFPA 88A 4.2]

8.4. Accessory use areas need not be separated if accessory use area does not exceed 10 percent of the story area. **[IBC 508.2]**

8.5. Assembly uses less than 50 persons shall be classified as Group B Occupancy or as an accessory to occupancy. **[IBC 303.1.1 and IBC 303.1.2, NFPA 101.6.1.2.1, NFPA 101 14.1.1.2]**

8.6. Accessory assembly areas are not considered as separate occupancies if 750 square feet or less. **[IBC 303.1.2(2) and NFPA 101 6.1.2.2]**

8.7. Garage/covered parking shall be separated from other areas by two hour construction with 90 minute doors or one-hour construction and automatic fire-extinguishing system with 45 minute doors**. [IBC 406, IBC Table 508.4 and Table 509]**

8.8. Protection from Hazards **[IBC Table 508.4]**

8.8.1. Electrical rooms in buildings with automatic sprinkler systems shall be sprinklered unless the room is dedicated to dry electrical equipment only with 2-hour fire barrier around the room and no combustible storage. **[NFPA 13 8.15.10.1]**

8.8.2. Electrical rooms with dry-type transformers rated larger than 112-1/2 KVA shall be installed in a 1-hour rated room with 45 min door. **[NEC 450.21]**

8.8.3. Electrical rooms with Dry transformers over 35,000 volts must be in a 3-hour rated vault with 3-hour door or 1-hour rated with a 45-minute door with a fixed extinguishing system of automatic sprinklers or gaseous agent extinguishers. **[NEC 450.42]**

8.8.4. Electrical rooms with oil-insulated transformers 35,000 volts or less may be installed indoors in NFPA Type I or II construction or protected with an automatic sprinkler system. **[NEC 450.26]**

8.8.5. In Education or Day Care facilities, provide 1-hour partitions or automatic sprinkler at Janitor's closet, boiler, furnace room, or hazardous storage**. [NFPA 14.3.2.1(1)]**

8.8.6. In Education or Day Care facilities, provide 1-hour partitions and automatic sprinkler at laundries, maintenance shops, and rooms processing hazardous or flammable materials**. [NFPA 4.3.2.1(2) and NFPA 16.3.2.1(2)]**

8.8.7. Storage rooms over 100 square feet shall be enclosed with one hour rated construction with 45-minute doors or provide automatic sprinkler system and smoke partitions. **[IBC Table 508.4 and NFPA 101 8.7.1, NFPA 101 36.3.2.2 & NFPA 101 38.3.2.2]**

8.8.8. Stationary lead-acid battery system over 100 gallons shall be enclosed with one-hour fire barriers and floor ceiling assemblies with 45-minute doors for Group B, F, M, S, and U and with two-hour fire barrier with 90-minute doors for Group A, E, I, and R. **[NFPA 1 52.3.3.3]**

8.8.9. Furnace room with any piece of fuel fired equipment shall be enclosed with one-hour rated construction with 45 minute doors or provide automatic sprinkler system smoke partition. **[IBC Table 508.4 and NFPA 101 8.7.1 & NFPA 101 12.3.2.1.2, NFPA 14.3.2.1.2, NFPA 101 16.3.2.1.2, NFPA 101 38.3.2.2]**

8.8.10. In I-2 Healthcare Occupancy boiler or furnace room with any piece of fuel fired equipment over 100 SQ FT shall be enclosed with one-hour rated construction with 45-minute doors and provide automatic sprinkler system**. [IBC Table 508.4, NFPA 101 8.7.1 & NFPA 101 Table 18.3.2.1]**

8.8.11. In R- or Lodging or Rooming Houses hazardous **[IBC Table 508.4, NFPA 101 8.7.1, & NFPA 101 26]**

8.8.12. In R- or Hotel & Dormitories hazardous [**IBC Table 508.4**, **NFPA 101 8.7.1**, & **NFPA 101 Table**

28.3.2.2.2]

8.8.13. In R- or Apartment Building hazardous [**IBC Table 508.4**, **NFPA 101 8.7.1**, & **NFPA 101 Table 30.3.2.1.1]**

8.8.14. In R- or Residential Board and Care hazardous [**IBC Table 508.4**, **NFPA 101 8.7.1,** & **NFPA 101 32.2.3.2]**

8.8.15. In M- or Mercantile and Care hazardous [**IBC Table 508.4**, **NFPA 101 8.7.1, & NFPA 101 36.3.2]**

8.8.16. Boiler over 15 psi and 10-horsepower shall be enclosed with one-hour rated construction with 45-minute doors or provide automatic sprinkler system with smoke partition. [**IBC Table 508.4** and **NFPA 101 8.7.1 & NFPA 101 38.3.2.2**]

8.8.17 Provide rated shaft where air ducts pass through floors that require protection of vertical openings. [**IBC 717.5.3** and NFPA 80 5.3.4.1]

8.8.18 A shaft that does not extend to or through the underside of the roof deck of the building shall be enclosed at the top with construction of the same fire resistance as the top most floor protected by the shaft, but not less than the rating required for the shaft enclosure. **[IBC 713.12]**

9. Roofing:

9.1. Provide minimum roof slope of ¼" per foot. **[IBC 1507.10, .11, .12, .13, .14, and .15]**

9.2. Foam plastic roof insulation shall be separated from the interior of the building by a thermal barrier **[IBC 2603.4.1.5] unless it complies with FM 4450 or UL 1256.**

10. Provide crawl space access (minimum 18 inches by 24 inches). [**IBC 1209.1]**

11. Attic Space:

11.1 Show draft stopping of attic area in combustible construction not to exceed 3000 sq ft unless equipped with an automatic sprinkler system**. [IBC 718.4.3, and NFPA 101 8.6.10.1(2), an NFPA 101 8.6.10.2(1)] Specify material to be used. [IBC 718.3.1]**

11.2 Provide attic access openings (minimum 20 inches by 30 inches) where clearance is a minimum of 30 inches. **[IBC 1209.2]**

11.3 Provide attic ventilation within each draft stop area. **[IBC 1203]**

12. Provide access to mechanical appliances installed under-floor areas, in attic spaces and of roofs or elevated structures in accordance with the International Mechanical Code **[IMC 3056 & IBC 1209.3]**

13. Glazing:

13.1 Glazing and openings in fire barriers shall be limited to 25% of the wall area, no larger than 120 square feet with unless tested to match wall rating. [**IBC 707.7, IBC 716.5.8.1, NFPA 101 8.3.3.9,** and NFPA 80 Chapter 13]

13.2 Glazing in rated doors shall be wired glass or other tested glazing material, and shall be limited in size according to door rating. [**IBC 716.2, IBC 716.5, IBC 716.6, and IBC Table 716.6**, **NFPA 101 8.3.3.7** and NFPA 80]

13.3 Fire-protection-rated glazing shall bear the following four-part identification: "W or D – H or NH – T or NT – XXX. Where W = Wall, D = Door, H = Hose stream, NH = not rated for hose stream, T = temperature requirements, NT = does not meet temperature rise, and XXX = rating in minutes. **[IBC 716.3, NFPA 101 8.3.2.1.2, and 8.3.3.10.1]**

13.4 Glazing in non-rated doors, sliding doors, storm doors, within **24 inches of doors, 18 inches above finished floor, and exceeding 9 square feet within 36** inches of walking surface shall be safety glazed, tempered, and pass the test requirements of CPSC 16 - CFR, part 1201 and comply with ANSI Z97.1. **[IBC 2406.1 & IBC 2406.3]**

13.5 A chair rail or other visual barrier is required at glass panels that may be mistaken for door. **[NFPA 101 7.2.1.1.2]**

14. Skylights and Glazed Roof:

14.1. Skylights or glazing at an angle less than 15 degrees from the vertical shall be glazed in compliance with **IBC 2404.**

14.2. Skylights or glazing at an angle greater than 15 degrees from the vertical shall be glazed in compliance with **IBC 2405.**

14.3. Light transmitting plastic skylights shall not be within six feet of rated exterior walls. **[IBC 2609.]**

14.4. Light transmitting plastic roof panels shall not be within six feet of rated exterior walls. **[IBC2610.7]**

15. Doors:

15.1. Provide smoke and draft control doors with fire and S label where a minimum fire protection door rating of 20 minutes or more, located in corridor walls or smoke barrier walls**. [IBC 716, NFPA 101 8.3.4.2, NFPA 101 Table 8.3.4.2, NFPA 101 8.4.3 and, NFPA 80]**

15.2. Specify that rated doors shall have rated frames, hardware, closers and other rated accessories**. [IBC 716., NFPA 101 8.3.3.2 and NFPA 80 1-4 Definition of "Fire Door", NFPA 80 1.6.1, 4.7,]**

15.3. Closers and positive latching are required on fire rated doors and doors in smoke tight partitions or barrier. **[IBC 716.5.8.3 & 716.5.9, NFPA 101 8.3.3.3, NFPA 80 2.4.1.2 and NFPA 80 2.4.4.3]**

16. Elevators [IBC Chapter 30, NFPA 101, NCAC Chapter 15 & ANSI/ASME A17.1]

16.1. An accessible route is required for this building **by TCA 68-120-204 (a) (1) and/or ADA 206.2.3 and/or 1104 of the 2012 IBC**

16.2. Review **IBC 1007.2.1** for building 4 stories or more requiring an elevator as part of the accessible means of egress meeting **IBC 1007** requirements.

16.3. Limited Use/Limited Application (LULA) elevators may not be used. [TCA 68-120-204, Rule 0620-2-3-.02, and Rule 0780-2-2-.01(1) (b) - -- ASME A117.17b is NOT a referenced Standard in Chapter 2 of the 2003 NFPA 1] (Also review ADA 408)

16.4. Elevators must comply with ADA 407 and with ASME A17.1. Contact State of Tennessee-Elevator & Boiler Division for guidance.

16.5. **Wheelchair platforms must conform to ADA 410**.

16.6. Elevators, shafts, and elevator machine rooms shall be enclosed with (one/two) hour fire barrier construction as per **IBC 707 & IBC 713 [IBC 713.4, IBC 713.14, IBC 3006.4 NFPA 101 8.6.5, NFPA 101 Chapter 11 to 40 .3.1 and Elevator Code ASME/ANSI A17.1**

16.7. Elevators and dumbwaiter hoist way doors and frames shall be labeled**. [IBC 713.7, IBC 713, NFPA 80 Chapter 8]**

16.8. Show venting of elevator and dumbwaiter hoist ways penetrating more than three floors unless sprinklered without overnight sleeping**. [IBC 3004.1]**

16.9. Where four or more elevators cars serve the same portion of a building shall be located in two separate hoist ways. Not more than four elevator cars shall be located in any single hoist way. **[IBC 3002.2, NFPA 101 8.6.8.3, and NFPA 101 9.4.4]**

17. Show detail of (one/two) hour construction where HVAC venting duct and metal chimneys pass through rated floors and/or roofs. **[IBC 713 and IMC]**

18. Atriums shall meet requirements of **IBC 404, IBC 909, NFPA 101 3.3.21, and NFPA 101 8.6.7.** Entire building shall be sprinklered with smoke control in atrium except connecting only 2 floors.

19. REQUIREMENTS for MOTOR VEHICLE RELATED OCCUPANCIES IBC 406

19.1 Fuel storage and dispensing shall meet the requirements of **IBC 406.8 and NFPA 1 Chapter 42.**

19.2 Provide mechanical ventilation at the repair garage area with ventilation control at the garage entrance. **[IBC 406.6.3 and IMC Table 403.3 and IBC]**

19.3 Repair garages shall have a flammable gas detection system for vehicles fueled by non-odorized gasses in accordance with **IBC Section 406.8.5 & 908.5.**

E.) MEANS OF EGRESS [IBC Chapter 10 and NFPA 101 Chapter 7]

1. Each required means of egress must be continuous and accessible through to the public way including sidewalks, ramps, exit stairs, horizontal exits, etc**. [IBC 1007.2 and NFPA 101 7.5.4.3]**

2. Provide accessible means of egress incorporating areas of refuge per [**IBC 1007.6 and NFPA 101 7.5.4]**

3. Areas accessible to people with severe mobility impairments other than existing buildings shall not have less than two accessible means of egress**. [NFPA 101 7.5.4.1 and IBC 1007.1]** One accessible means of egress will be permitted for where a single means of egress is permitted for the general occupancy load. **[IBC 1007.1, and NFPA 101 7.5.4.1.2]**

4. Travel distance **[IBC 1016 and IBC Table 1016.2,** NFPA 101 Chapters 12-43 x..2.6]

4.1. Occupancies IBC & NFPA A, E, F-1, I-1, R, & S-1 shall be 200 feet without sprinklers and 250 feet with sprinklers. **[IBC 1016.2, IBC Table 1016.2**, & NFPA 101 12.2.6, xx]

4.2. Occupancies IBC M & NFPA Mercantile shall be 150 feet without sprinklers and 250 feet with sprinklers. [**IBC 1016.2, IBC Table 1016.2,** & NFPA 101 36.2.6]

4.3. Occupancies IBC & NFPA B 200 feet without sprinklers and 300 feet with sprinklers. **[IBC 1016.2 and IBC Table 1016.2**, & NFPA 101 38.2.6]

4.4. IBC Occupancies F-2, S-2, & U shall be 75 feet with sprinklers. [**IBC 1016.2 and IBC Table 1016.2, & NFPA 101]**

4.5. IBC Occupancies H-1 shall be 75 feet with sprinklers. [**IBC 1016.2 and IBC Table 1016.2,** & NFPA 101]

4.6. IBC Occupancies H-2 shall be 100 feet with sprinklers. **[IBC 1016.2 and IBC Table 1016.2,** & NFPA 101]

4.7. IBC Occupancies H-3 shall be 150 feet with sprinklers**. [IBC 1016.2 and IBC Table 1016.2**, & NFPA 101]

4.8. IBC Occupancies H-4 shall be 175 feet with sprinklers. [**IBC 1016.2 and IBC Table 1016.2,** & NFPA 101]

4.9. IBC Occupancies H-5 shall be 200 feet with sprinklers. [**IBC 1016.2 and IBC Table 1016.2**, & NFPA 101]

4.10 Occupancies IBC I-2, I-3 & I-4 & NFPA 101 Healthcare shall be150 feet without sprinklers and 200 feet with sprinklers. **[IBC 1016.2 and IBC Table 1016.2]**

4.11 At least one accessible exit or area of refuge must exist within the travel distance providing an accessible route to an exit discharge. [**IBC 1007**, **and NFPA 101 7.5.4.1.1]**

5. Provide tactile exit signs centered 60 inches above finished floor stating "EXIT" complying with **2010 ADA** at each door to an egress stairway, an exit passageway, and exit discharge. [**IBC 1011.4,NFPA 101 7.10.1.3, NFPA 101 7.10.1.4, and 2010 ADA 216 & 703**] Where exit sign illumination is required by section 1011.3, the signs shall be illuminated. Additionally, raised character and Braille signage complying with ICC A117.1 shall be located at each door to an area of refuge and exterior area for assisted rescue in accordance with section 1011.4.

6. Number of Exits

6.1. Two exits required except for Single Exits from spaces **IBC Table 1015.1**, & NFPA XXXXX

6.1.1. Rooms with occupancies IBC A, B, E, F, M, & U of 50 or less may have 1 exit. **[IBC Table 1015.1**, NFPA101]

6.1.2. Rooms with occupancies IBC H-1, H-2, & H-3 of 3 or less may have 1 exit. **[IBC Table 1015.1**, NFPA101]

6.1.3. Rooms with occupancies IBC H-4, H-5, I-1, I-3, I-4, & R of 10 or less may have 1 exit. **[IBC Table 1015.1**, NFPA101]

6.1.4. Rooms with occupancies IBC S of 29 or less may have 1 exit. **[IBC Table 1015.1**, NFPA101]

6.2. Spaces or rooms with a common path of egress travel exceeding 75 feet shall have two separate and distinct means of egress**. [IBC Table 1014.3 and NFPA 101 38.2.4.2]**

6.3. In a single story building two exits or more are required when occupant load exceeds 50 or, common path of egress travel exceeds 75 feet. **[IBC 1021]**

6.4. In a two story building two exits or more are required when occupant load exceeds 30 or, common path of egress travel exceeds 75 feet. **[IBC 1021 & NFPA101 38.2.4]**

6.5. Two exits or more are required when occupant load of a room or space exceeds 50 or, common path of egress travel exceeds 75 feet. [IBC 1015.1, IBC Table 1015.1 and, NFPA 101 38.2.4]

6.6. The number of exits shall comply with **IBC Table 1018.1, NFPA 101 7.4, and NFPA 101 38.2.4. and 7.4.**

6.7. When two exits are required from a building or area they shall be separated by (one-half/one-third if sprinklered throughout) the diagonal dimension of the building or area served. **[IBC 1015.2.1 and NFPA 101 7.5.1.3.2]**

6.7.1. Where two exits or exit access doors are required the exits serving such means of egress must be separated by 1/2 the maximum diagonal dimension of the building. **[IBC 1015.2.1, & NFPA 101 7.5.4.2]** Where exit enclosures are provided as the required exit and interconnected by a 1-hour rated corridor, exit separation is permitted to be along the rated corridor. **[IBC 1015.2.1 & NFPA 101 7.5.4.2.1]**

6.7.2. When accessible exits are required to be placed 1/2 the diagonal dimension apart **by NFPA 101 7.5.4.2 and/or IBC 1015.2**. Separation must be provided to reduce the possibility that both can be blocked by a single fire or emergency event. **[NFPA 101 7.5.4.3.2 and IBC 1015.2]**

6.8. Two exits or exit access doors of egress shall be provided from boiler, incinerator, or furnace rooms which exceed 500 square feet and any fuel fired equipment exceeding 400,000 BTU input capacity. One exit is permitted to be a fixed ladder or alternating tread device. Exit access doorways shall be separated by a horizontal distance equal to one-half the maximum horizontal dimension of room. **[IBC 1015.3]** Mechanical rooms shall comply with the travel distance requirements of **NFPA 101 7.12.** (Maximum distance of travel is 50 feet if unsprinklered and 100 feet if sprinklered.)

6.9. Two exits or exit access tight fitting and self-closing doors of egress swinging in direction of travel shall be provided from refrigeration machinery rooms which exceed 1000 square feet. One exit is permitted to be a fixed ladder or alternating tread device. Exit access doorways shall be separated by a horizontal distance equal to one-half the maximum horizontal dimension of room. Mechanical rooms

shall comply with the travel distance requirements of **NFPA 101 7.12.** (Maximum distance of travel is 50 feet if unsprinklered and 100 feet if sprinklered.)

6.10. In electrical room two exits or exit access doors of egress swinging in direction of travel with latching doors which open under simple pressure shall be provided from electrical rooms with equipment rated 1200 amperes or more. **[NEC NFPA 70 110 26(c)].**

7. Grade Changes:

7.1. Changes in elevation of 12 inches to less than 21 inches in the means of egress shall be by ramp or stair complying with **NFPA 101 7.2.2 & 7.2.5**. This includes handrails, 13-inch treads, and readily visible treads. **[IBC 1009 , 1010 and NFPA 101 7.1.7]**

7.2. Floors on a given story must be on a common level throughout or be connected by a ramp in accordance with **[2010 ADA 206.2.3**]

7.3. Abrupt changes in elevation shall not exceed ¼ inch, shall be beveled 1 to 2 if between ¼ inch and ½ inch and if greater shall be a change in level and treated as a ramp or stair **[IBC 1008.1.5 & 1008.1.6, NFPA 101 7.1.6.2, and 2010 ADA Chapter 3]**

8. Ramps: **IBC 1010, NFPA 101 7.2.5 , 2010 ADA-405**

8.1. Ramps greater than 1 in 20 or 5 percent with a rise greater than 6” shall have handrails on both sides.

8.2. The maximum slope of a ramp may not exceed 1 in 12.

8.3. Interior ramps or ramps in renovation projects must have a minimum clear width of 36 inches.

8.4. Ramps may not rise more than 30 inches without an intermediate landing.

8.5. Landings at top and bottom of ramps must be as wide as the ramp (minimum) by 60 inches

8.6. Ramps at changes of directions must be a minimum of 60” by 60”

8.7. Ramp handrails :

8.7.1. Slopes steeper than 1 to 20 are ramps and must have handrails along both sides of a ramp with a rise in excess of 6”.

8.7.2. Ramp handrails must be mounted 34” (min.) and 38” (max.) for new handrails and 30” (min.) to 38” (max) for existing handrails above walking surface with a 12-inch horizontal extension at the top and bottom landings.

8.7.3. Ramp handrails that end at corridors, hallways, etc. must not extend more than 3 ½ inches into the passageway.

8.7.4. Ramp handrails must be 1-1/4 to 1-½ inches in diameter.

9. Stairs: **IBC 1009, NFPA 101 7.2.2, & 2010 ADA-504**

9.1. Stair enclosure shall be one-hour rated for three floors or less and two-hour rated for 4 or more floors.

9.2. Exterior stairs shall be separated from the interior of the building with the same rating required for interior stairs.

9.3. An exit enclosure shall provide a continuous protected path of travel to an exit discharge.

9.4. Exit stairwell doors shall be labeled 1-hour for 1-hour rated walls and 1 ½-hour for 2-hour rated walls and shall be rated so that the unexposed side does not exceed 450° F

9.5. Prohibited Penetrations: Penetrations other than those necessary for the purpose of the exit access stairway enclosure shall not be permitted in exit access stairway enclosures. **IBC 1009.3.1.5.1 & 1022.5]**

9.6. **Stairway identification signs required at each floor landing [IBC 1022.9]**

9.7. Width of stairs

9.7.1. Minimum of 36” wide stairs when total occupant load is less than 50 Minimum of 44” wide stairs when total occupant load is greater than 50 and less than 2000.

9.7.2. Minimum of 56” wide stairs when total occupant load is equal to or greater than 2000.

9.7.3. Stair exits as part of an accessible means of egress from an area of refuge shall have a minimum of 48” wide stairs between handrails unless sprinklered

9.7.4. Enclosed Stair exits shall have an area of refuge (2 30” x 48” spaces) within the stair even when

the building has an automatic sprinkler system unless the area of refuge requirement is met by a horizontal exit or open parking structures.

9.8. Minimum headroom clearance in stair enclosures shall be 6'-8

9.9. Stair treads and risers **[IBC 1009.7.2]**

9.9.1. Stair treads shall be minimum 11 inches and risers shall be maximum 7-inches but not less than 4-inches (without square nosing) and shall be designed in accordance with **IBC 1009** and **NFPA 101 Table 7.2.2.2.1(a)**

9.9.2. Treads and risers shall be solid in all occupancies except where not used as an exit stair (but must not permit a 4" sphere to pass) or I-3.

9.9.3 Where the bottom riser adjoins a sloping public way, walk, or driveway having an established grade and serving as a landing the bottom riser may be less than 4" with a slope not to exceed 1" in 12" with a 1" to 2" wide distinctive marking strip at the nosing of the non-uniform riser.

9.9.4 Square edged stair nosing is not permitted.

9.10. Rise may not exceed 12 feet between floors or landings. [**IBC 1009.10, NFPA 101 Table 7.2.2.2.1.1(a)]**

9.11. In Type I & II buildings stair construction shall be non-combustible. **[IBC 1009.9]**

9.12. Stairs serving upper floors shall be separated by a barrier to prevent travel beyond the level of exit discharge. **[IBC 1022.8 & NFPA 7.7.3]**

9.13. One stair shall extend to the roof for buildings four stories and greater in height**. [IBC 1009.16]**

9.14. Normally unoccupied spaces and hazardous areas may not open into an exit stairwell or exit passageway**. [IBC 1009.3.1.4, and NFPA 101 7.1.3.2.1(5)]**

9.15. Not more than 50% of the exits may discharge through areas on the level of discharge unless all of the exceptions are met**. [IBC 1027 and NFPA 101 7.7.2]**

9.16. Door swing may not reduce landing to less than one-half its required width. **[IBC 1009.4, IBC 1005.1 & NFPA 101 7.2.1.4.3]**

9.17. Doors, windows, and openings within ten feet horizontal projection shall be protected as required for stairway enclosures**. [IBC 1020.1.4 and NFPA 101 7.2.2.5.2]**

9.18. Provide stairway floor number sign at each landing in interior exit enclosures connecting more than 3 stories located 60 inches above finished floor, positioned to be viewed with the doors are either open or closed, and stating "level, level of discharge and availability of roof access". **[IBC 1020.1.6 & NFPA 101 7.10.1.3]**

10. Handrails and Guardrails**:[IBC 1009.10, IBC 1012, IBC 1013, NFPA 101 7.2.2.4,NFPA 101 7.2.5.4, 2010 ADA 505]**

10.1. Handrails and guard rails shall be in accordance with **IBC 1009.10, IBC 1012, IBC 1013, NFPA 101 7.2.2.4, and 2010 ADA 505** (i.e., 34" and 42" mounting height for hand and guard rails, respectively; hand railing on both sides of stairs; 12" minimum handrail extension on wall side at top of stair; 23" minimum handrail extension on wall side at bottom of stair; four-inch diameter sphere maximum; etc.).

10.2. Mounted 34" (min.) and 38" (max.) [for new handrails] and 30" (min.) to 38" (max) [for existing handrails] above the nosing with a 12-inch horizontal extension at the top landing and continue sloping down one tread's width at the bottom landing and then continue for an additional 12"

horizontally. **[IBC 1012.2, NFPA 101 7.2.2.4.4.2, NFPA 101 7.2.2.4.4.10, and NFPA 101 fig. A.7.2.2.4.4 "Elevation View"] [2010 ADA 505]**

10.3. Handrail extension, at the top or bottom, must not create a hazard and must be made on the side of a continuing wall or partition**. [IBC 1012.5, NFPA 7.2.2.4.4.1 and 2010 ADA 505]**

10.4. Handrails are to be continuously graspable along their length and not interrupted by newel posts. **[IBC 1012.3, NFPA 101 7.2.2.4.4.6 (2), NFPA 101 7.2.2.4.4.7 and 2010 ADA 505]**

10.5. Guardrails (min of 42" high) are required on open side of walking surfaces, mezzanines, industrial equipment, platforms, stairways, and landings 30 inches above floor or grade surface. **[IBC 1013.1, IBC 1013.2, and NFPA 101 7.2.2.4.5]**

10.6. Handrails in a stair shall be within 30 in of all portions of the required egress width. **[IBC 1012.8 &NFPA 101 7.2.2.4.1.2(1)]**

10.7. Provide guardrail protection at roof hatch openings where opening is within 10-feet of the roof opening. **[IBC 1009.11.2]**

11. Corridors:

11.1. Corridor Widths [IBC 1018.2, & NFPA Chapters 12-43 2.3]

11.1.1. Minimum 36-inches with a required occupancy capacity of less than 50**. [IBC Table 1018.2 NFPA 101 7.3.2, & NFPA 101 30.2.3.4]**

11.1.2. Minimum corridor width of 44 inches is required when the occupant load is 50 or greater. **[IBC Table1018.2, NFPA 101 12.2.3.8,(non-patient areas NFPA 101 18.2.3.4 & NFPA 101 18.2.3.5), NFPA 101 20.2.3.2, NFPA 101 28.2.3.3, NFPA 101 30.2.3.3, NFPA 101 38.2.3.2]**

11.1.3. Minimum 24-inches for access to electrical, mechanical, or plumbing systems or equipment. **[IBC Table 1018.2]**

11.1.4. Minimum 36 in. or 3 ft within a dwelling unit. **[IBC Table 1018.2 & NFPA 101 24.2.6.1]**

11.1.5. Minimum 48 in. or 4 ft corridor in I-3 Detention & Correction facilities [**NFPA 101 22.2.3.2]**

11.1.6. Minimum 60 in. or 5 ft aisles in Class A M. **[NFPA 101 36.2.5.6]**

11.1.7. Minimum 72 in. or 6 ft in Group E with a required occupancy capacity of more than 100**. [IBC Table 1018.2 & NFPA 101 14.2.3.2]**

11.1.8. Minimum 72 in. or 6 ft in Group B, I, or healthcare for ambulatory patients receiving outpatient care which causes the patient to not be capable of self-preservation**. [IBC Table 1018.2 NFPA 101 20.2.3.4]**

11.1.9. Minimum 96 in. or 6 ft in Group I-2 or Healthcare where required for bed movement. **[IBC Table 1018.2 & NFPA 101 18.2.3.4]**

11.2. Occupancies A, B, E, F, M, S, & U Corridors walls serving 30 people or more shall be one hour rated fire partition with 20-minute door and hardware assemblies or unrated 0-hour rated with automatic sprinkler system. **[IBC 708, IBC 1018, IBC Table 1018.1, NFPA 101 7.1.3.1, NFPA 101 Table 8.3.4.2, NFPA 101 12.3.6(5), NFPA 101 14.3.6(2), NFPA 101 36.3.6.1 and NFPA 101 38.3.6(3)]**

11.2.1. Education group E corridor walls are not required to be rated when doors to the exterior are provided from each instructional space and 50% of the assembly spaces. **[IBC 1018.1 Exception 1 and NFPA 14.2.5.5(1)]**

11.3. Group I-2 Healthcare Occupancy Corridors walls are required to have unrated IBC Smoke Partition (IBC 1017) serving unrated latching doors without draft control or closers. **[IBC 407.3, IBC 710, IBC 1018, IBC Table 1018.1, NFPA 101 7.1.3.1, NFPA 101 Table 8.3.4.2, NFPA 101 18.3.6.2]**

11.4. Residential corridor walls where building is sprinklered shall be ½ hour rated with 20-min. doors with smoke and draft control label. **[IBC Table 1018.1]**

11.5. Dead End Corridors

11.5.1. In Group A- Assembly, Group E Education, Group I-4 Day Care Facilities, Group I-2 Healthcare, occupancies dead ends in exits and exit access may not exceed 20 feet. **[IBC 1017.3, & NFPA 101 12.2.5.1.3, NFPA 101 14.2.5.2, NFPA 101 16.2.5.2, NFPA 16.6.2.5.3, NFPA 18.2.5.2, NFPA]**

11.5.2. Dead ends in exits and exit access may not exceed 20 feet or 50 feet if building has automatic sprinklers in Occupancy B & F. **[IBC 1017.3, NFPA 101 36.2.5.2, NFPA 101 36.2.5.2.1, NFPA 101 36.2.5.2.2, NFPA 101 38.2.5.2.1 and, NFPA 101 38.2.5.2.2]**

11.5.3. In Group I-3 Detention & Correctional Facilities, occupancies dead ends in exits and exit access may not exceed 50 feet Occupancy A. **[IBC 1017.3 Exception 1, &NFPA 101 22.2.5.2]**

12. When there are multiple tenants each tenant shall be provided with access to the required without passing through adjacent tenant spaces. **[IBC 1014.2.1]**

13. Common path of travel:

13.1. Common path of travel may not exceed 75 feet. **[IBC 1014.3 and NFPA 101 38.2.5.3.5]**

13.2. Common path of travel may not exceed 100 feet when sprinklered**. [IBC 1014.3 exception 1 and NFPA 101 38.2.5.3.1]**

13.3. Common path of travel may not exceed 100 feet when there is a single group B tenant not exceeding 30 persons. **[IBC 1014.3 exception 2 and NFPA 101 38.2.5.3.2]**

14. Doors and Doorways:

14.1. The floor on both sides of any door shall be substantially level except for exterior landings which may have a slope of 0.25 units vertical in 12 units horizontal (2-percent slope) plus 0.5 inch due to finish material **[IBC 1008.1.5 and NFPA 101 7.2.1.3]**

14.2. Thresholds at doors shall not exceed ½ inch in height. **[IBC 1008.1.7, NFPA 101 7.2.1.3.3 and 2010 ADA 404]**

14.3. Doors opening onto a corridor of minimum required width shall swing 180 degrees, and not reduce the required corridor width to less than one half during its swing. **[IBC 1005.7 and, NFPA 101 7.2.1.4.4]**

14.4. Each leaf of door in the means of egress shall provide 32 inches clear opening (door open 90 degrees) and a minimum height of 6'-8", but in no case shall any single door leaf exceed 48 inches**. [IBC 1008.1.1, NFPA 101 7.2.1.2.4& 2010 ADA 404]**

14.5. Have an out-swinging door which provides a minimum clear opening of 32 inches when the door is in the full open position (door open 90°) or for in-swinging doors configured such that a partition or wall located adjacent to the strike jamb on the pull side of an interior or exterior door must not be less than 12 inches (for doors swinging away from the person) or 18 inches (if the door needs to be pulled in towards the person) from the jamb, respectively**. [2010 ADA 404]**

14.6. The distance between two consecutive doors that swing in the same direction must be at least 48 inches plus the width of the widest door swinging into the space. **[2010 ADA 404.2.6]**

14.7. Passage doors with latching hardware must be equipped with operating hardware devices that

does not require twisting, tight grasps or any wrist action such lever handle and push/pull latch. **[2010 ADA 404.2.7 to 404.3.7 and 309.4]**

14.8. Textured surface is required on door handles leading to areas hazardous to people visually challenged or blind (boiler rooms, electrical equipment room, etc.)

14.9. Projections within the door required clear width shall not be greater than 3½ inches when between 34 inches and 80 inches (6'-8") above finished floor. **[IBC 1008.1.1.1 and NFPA 7.2.1.2.1]**

14.10. Doors serving 50 or more people and stairway doors shall swing with the direction of exit travel. **[IBC 1008.1.2 and NFPA 101 7.2.1.4.2]**

14.11. Provide a door in the folding partition**. [NFPA 101 7.2.1.12]**

14.12. Show that power operated doors are capable of being manually opened to permit exit travel in the event of a power failure. **[IBC 1008.1.4.2 and NFPA 101 7.2.1.9.1]**

14.13. Door assemblies in the means of egress shall be permitted to be electrically locked if equipped with approved, listed hardware that incorporates a built-in switch, provided that certain conditions are met. **[NFPA 101 7.2.1.5.5]**

14.14. Astragals and coordinators are required with pairs of doors where the fire resistance rating is 1½-hours or more. [NFPA 80 4.7.1 and NFPA 80]

14.15. Door opening force to open:

14.15.1. Exterior doors if air pressures require stronger closers may be as great as 8.5 pounds **[2010 ADA 404]**

14.15.2. Fire doors minimum allowed by the authority having jurisdiction to ensure proper function **[2010 ADA 404.2.4.7]**

14.15.3. Interior doors may be no more than 5 pounds**. [2010 ADA 404.2.4.9]**

14.16. Framed glass doors are required to have a 7-½ inch bottom rail or kick-plate which cannot transfer any force to the glass. **[……..]**

14.17. Vision panels in corridor doors must have the lower edge no higher than 40 inches above the finished floor**. [2010 ADA 703.5.5]**

14.18. Smoke and draft control labels

15. Every assembly area shall have the occupant load posted in a conspicuous place near the main exit of the roo**m. [IBC 1004.3 and NFPA 101 12.7.9.3]**

F.) <u>INTERIOR</u>

1. Finishes:

1.1. In vertical exits and exit passageways, interior wall and ceiling finish shall have Class A in unsprinklered buildings or Class B rating in sprinklered buildings. **[IBC Table 803.9 and NFPA 38.3.3.2.1] See NFPA 101 10.2 and IBC 803.1.2 for classification definitions.**

1.2. In office areas, interior wall and ceiling finish shall have Class A, B, or C in sprinklered or unsprinklered buildings. **[IBC Table 803.9 and NFPA 101 38.3.] See NFPA 101 10.2 and IBC 803.1.2 for classification definitions.**

1.3. In vertical exits, exit passageways and, exit access corridors carpet flooring shall be Class II 0.22 watts/cm^2 in unsprinklered buildings or greater or DOC FF-1 "pill test" (CPSC 16 CFR, Part 1630) with automatic sprinklers. **[IBC 804.4, NFPA 101 38.3.3.3 and NFPA 101 10.2.7.2]**

1.4. Textiles and carpet on ceilings shall be Class A (ASTM E 84) and be protected by automatic sprinklers or meet Method A test protocol IBC 803.6.1.1, or Method B test protocol **IBC 803.1.4. [IBC 803.6. & NFPA 101 10.2.4.1]**

1.5. Textiles and carpet on ceilings shall be Class A (ASTM E 84) and be protected by automatic sprinklers. **[IBC 803.5]**

1.6. Folding partitions shall comply with interior finish requirements. **[IBC 803 & NFPA 101 7.2.1.12.1]**

2. Toilets

2.1. Floors of toilets shall have a smooth, hard, nonabsorbent surface that extends a minimum of **4-inches** up the wall. **[IBC 1210.2.1]**

2.2. Walls of toilets within 2 feet of urinals or water closets shall have a smooth, hard, nonabsorbent surface, to a height of 4 feet above finished floor in materials except for structure that is not adversely affected by moisture**. [IBC 1210.2.2]**

2.2.1. Toilet rooms shall not open directly into room used for food preparation service to the public. **[IBC 1210.4]**

2.2.2. Public toilet facilities cannot be accessed through kitchens and storage space. **[IPC 403.3.1]**

2.2.3. Provide urinal partitions between urinals except in single occupant toilet rooms. **[IPC 1210.3]**

2.2.4. Provide urinal partitions between urinals except in single occupant toilet rooms or daycare or childcare facilities. **[IPC 1210.3]**

2.3. Accessible Toilets General

2.3.1. Wheel chair accessible compartments shall be 60” wide minimum measured perpendicular to the side wall, and 56” deep minimum for wall hung water closets and 59” deep minimum for floor mounted water closets measured perpendicular to the rear wall. **[ADA 213.1, 603 and 604.2 through 604.8]**

2.3.2. The swing of a toilet room entry door may overlap the minimum clear floor area by a maximum of 12 inches. **[ADA 404 & 604.8.1.2]**

2.3.3. **Clear floor space requirements for lavatories and sinks. [ADA 606.2, 305 and 306]**

2.3.4. **Stairways [ADA 504]**

2.3.5. Handrails [ADA 505]

2.3.6. Drinking Fountains [ADA 602]

2.3.7. Toilet and Bathing Rooms [ADA 605]

2.3.8. Water Closets and Toilet Compartments [ADA 604]

2.3.9. **Urinals [ADA 605]**

2.3.10. **Lavatories and Sinks [ADA 606]**

2.3.11. **Bathtubs [ADA 607]**

2.3.12. **Shower Compartments [ADA 608]**

2.3.13. **Grab Bars [ADA 609]**

2.3.14. **Bath and Shower Seats [ADA 610]**

2.3.15. **Dressing, Fitting and Locker Rooms [ADA 222]**

2.3.16. **Assembly Seating [ADA 221 & 808]**

G.) MECHANICAL

1. 2012 International Energy Conservation Code Requirements:

1.1. Provide Exterior and Interior HVAC Design Conditions.**[IECC 302]**

1.2. Provide required efficiency on equipment lists for mechanical and plumbing equipment. **[IECC Chapter 403 and Chapter 404.**

1.3. Provide a Statements of Compliance for the following: **[IECC 101.5.]**

1.3.1. Statement of Compliance for the Building Mechanical and Plumbing Systems. **[IECC 403 & IECC 404]**

1.4. Provide HVAC controls in accordance with **IECC Section 403.2.4.**

1.5. Outdoor air intakes and exhaust openings shall be equipped with not less than a Class 1 motorized, leakage rated damper with a maximum leakage rate of 4 cfm per sf at 1.0" water gauge as per AMCA 500D. Note gravity dampers are permitted in building less than 3 stories. **[IECC 402.4.4]**

2. Provide independent ventilation or air conditioning in elevator equipment rooms to maintain temperature within elevator equipment requirements. **[IBC 3006.2 & NFPA 101 9.4.5]**

3. Mechanical systems shall not be located in an elevator shaft. **[IBC 3004.4]**

4. Penetrations of exit passageway such as steam lines, gas lines, water lines, electrical conduit, and duct are prohibited. Only sprinkler piping, standpipes, electrical conduit serving the stairwell and ductwork and other equipment necessary for smoke control are permitted. **[IBC 1021.4, IMC 607.5.5, and NFPA 101 7.1.3.2.1]**

5. Penetrations of stairwells such as steam lines, gas lines, water lines, electrical conduit, and duct are prohibited. Only sprinkler piping, standpipes, electrical conduit serving the stairwell and ductwork and other equipment necessary for stair pressurization are permitted. **[IBC 714, IMC 607.5.5, and NFPA 101 7.1.3.2.1]**

6. Dampers

6.1. Fire dampers are required where air ducts penetrate or terminate at fire barriers with fire resistance ratings of 2-hours or more. **[IBC 717.5.2, IMC 607.5.2, NFPA 101 8.3.5.7, NFPA 101 9.2.1**, NFPA 90A 5.3.1]

6.2. Where air ducts pass through 1-hour rated fire barrier without fire dampers the entire duct system shall be a minimum of 26 gage thick continuous from equipment to air outlet. **[IBC 717.1.1, IMC 607.5.2, NFPA 101 8.3.5.7, NFPA 101 9.2.1,** and NFPA 90A 5.3.1]

6.3. Fire dampers are required at 1-hour rated fire partitions where air ducts are greater than 100 square inches and a minimum 26 gage. **[IBC 717.5.4, IMC 607.5.3, NFPA 101 8.3.5.7, NFPA 101 9.2.1,** NFPA 90A 5.3.1] **REVIEW IMC EXCEPTIONS**

6.4. Fire dampers are required where ductwork penetrates a rated floor unless it is enclosed in a rated shaft. **[IBC 717.6, IMC 607.5** and NFPA 90A 5.3.2.1] Show specific location.

6.5. Provide fire dampers where air ducts penetrate rated shafts**. [IBC 717.5.3.1, IMC 607.5.5.1, NFPA 101 8.6.5** and, NFPA 90A 5.3.4.1]

6.6. Provide fire/smoke combination dampers in transfer air grille openings through fire rated walls. A smoke damper is required at these openings for unrated walls with automatic sprinkler protection that shall resist the passage of smoke. [NFPA 101 8.7.1.2]

6.7. Smoke dampers are required in air duct penetrations of smoke walls or barriers, unless the duct is a part of a smoke removal system**. [IBC 717.5.5, IMC 607.5.4, NFPA 101 8.5.5.2**, and NFPA 90A 5.3.5.1 and, NFPA 90A 5.4.3] Show specific locations.

6.8. Smoke dampers are required in air duct penetrations 1 hour fire rated fire partition corridor requiring smoke and draft control. **[IBC 717.5.4.1, IMC 607.5.4, NFPA 101 8.5.4.2,** NFPA 90A 5.4.3 and, NFPA 90A 5.3.5.1] Show specific locations.

6.9. Combination smoke and fire dampers shall be required where a fire and smoke barrier or wall is required. [**IBC 717.3, IMC 607.3, NFPA 101.8.5.5.3**, NFPA 90A 5.4.5]

6.10 When IBC smoke partitions occur, provide smoke dampers as required to prevent smoke within corridors**. [IBC 710.8]**

7. Diffusers in rated ceilings shall have heat shields in accordance with tested assembly design. **[IMC 607.6.2**, NFPA 90A 5.3.3.1 and, NFPA 90A 5.4.4.2]

8. Show how the one-hour floor/ceiling integrity is maintained where duct connectors are used. [NFPA 90A 3.3.4 and .5]

9. Smoke Detectors

9.1. Systems greater than 2,000 CFM shall have duct mounted smoke detectors mounted in the supply duct downstream of all filters. [NFPA 90A 6.4.2.1]

9.2. Systems greater than 2,000 CFM shall have duct mounted smoke detectors mounted in the return duct or plenum upstream of all filters, exhaust, fresh air or decontamination equipment. **[IMC 606.2.1]**

9.3. Systems greater than 15,000 CFM which have return air risers serving two or more floors shall have duct smoke detectors at each floor. **[IMC 606.2.3** and NFPA 90 6.4.2.1(2)]

9.4. Provide a smoke detector in duct or plenum within 5 feet of the smoke damper. **[IMC 607.5.4.1.1, IMC 607.5.4.1.3,** NFPA 101 8.4.6.4, & NFPA 72]

9.5. Provide a smoke detector on the ceiling on each side of a smoke control door to activate smoke damper above. **[IMC 607.5.4.1.2** and, NFPA 101 8.5.5.2, & NFPA 72]

9.6. Smoke detectors in duct work shall be wired to a central control panel, which is constantly monitored, or be wired to a general building alarm. **[IMC 606.4.1** and NFPA 90A 6.4.4.3]

10. An exit access corridor cannot be used for return or exhaust from adjoining air conditioned spaces through louvers or other devices mounted in corridor doors, partitions, or ceilings unless the corridor is designed to comply with **IBC 1018.5, Exceptions**.

11. Combustible material may not be used within a return air plenum unless it is tested for that application**. [IMC 602** and NFPA 90A 4.3.10]

12. Provide information showing how combustion air and ventilation are provided for the room that contains fuel fired equipment. **[IMC 202, IMC 701-manufacturer's installation instructions, IFGC 304**, and NFPA 54 5.3] Show size, free area, location of vents (within 12" above finished floor and 12" below ceiling), and 1/4" corrosion resistant exterior screen. **[IFGC 304]**

13. [outside air 304.6]

14. In an Ambulatory healthcare facility a fuel fired heating system shall have combustion air from the outside, with the combustion system separated from the atmosphere of the occupied area. **[NFPA 101 20.5.2.2]**

15. Corridor ceiling plenum return is only permitted when one or more conditions of **IBC 1018.5.1** are met.

16. Commercial Kitchen Hood

16.1. Provide a Type I commercial kitchen hood meeting the requirements of IMC or UL 710 or UL 197, with fire suppression UL 300 and make up air where cooking appliance including domestic cooking appliances produce grease or smoke such as occurs with griddles, fryers, ovens, ranges and work ranges. Provide hood and duct design intent information. **[IBC 904.2.1, IBC 904.11, IMC 506, IMC 507, IMC 508, IMC 509, NFPA 101 9.2.3** and NFPA 96]

16.2. The exhaust outlet ducts and ducts serving a Type I commercial cooking and processing equipment shall terminate outside the building and shall be located ten feet from any adjacent building, parking area, adjacent property line, window, door or air intake opening and shall be minimum ten feet above adjoining grade level and shall terminate 40 inches above roof surface when there is a roof termination. **[IMC 506.3.12]**

16.3. Provide a manual fire suppression actuation device at or near a means of egress from the cooking area a minimum of 10 feet but no more than 20 feet from the kitchen exhaust system (Type I hood). **[IBC 904.2.1, IBC 904.11, IBC 904.11.1,** NFPA 96]

16.4. The actuation of the commercial kitchen hood (Type I hood) shall automatically shut down the fuel or electrical power supply to the cooking equipment with a manual reset. **[IBC 904.11.2,** NFPA 96]

16.5. Provide a Type I or Type II hood where cooking or dishwashing appliances produce heat or steam and do not produce grease or smoke. **[IMC 507**, NFPA 96 if Type I]

17. Mechanical exhaust is required for bathrooms, locker rooms, smoking lounges and toilet rooms**. [IBC 1203.4.2, IMC Table 403.3 and IMC 502.18]**

18. Each room or space that contains flammable or combustible vapors, noxious gases, flammable dusts, or that serves incompatible materials shall be equipped with a separate and individual exhaust system. **[IMC 502.1]**

19. Provide mechanical ventilation in repair and garage parking area with control at entrance to garage. (**IBC 406.3.12,IBC 406.6.3 IMC Table 403.3 and IMC 404)**

20. Chimney, vent or sanitary sewer exhaust outlets within ten feet of fresh air intakes shall be at least two feet lower than the contaminate. **[IMC 401.4.]**

21. Machinery room equipment and appliances shall have a remote control except where the machinery refrigerant is nonflammable. **[IMC 1106.5]**

22. Machinery room with refrigeration equipment shall have a refrigerant detector**. [IMC 1105.3]**

23. Provide primary condensate drain for evaporators and cooling coils disposed in an approved location without causing a nuisance**. [IPC 307.2, IPC 307.2.1, IMC 307.2 & IMC 307.2.1]**

24. Provide secondary condensate drain for evaporators and cooling coils disposed of where the drain can indicate usage and the clogging of the primary drain. [**IPC 307.2 & IMC 307.2.3]**

H.) <u>PLUMBING</u>

1. 2012 IEEC-Energy Code Compliance:
1.1. Provide required efficiency on equipment lists for plumbing equipment. **[IECC 404]**

1.2. Provide a Statements of Compliance for the following: **[IECC 101.5.1**]
1.2.1. Statement of Compliance for the Building Mechanical and Plumbing Systems**. [IECC 403 & IECC 404]**

2. Provide toilet fixture calculations per **IBC Table 2902.1 and IPC Table 403.1.**

3. Provide tempered water at bidet (=< 110 F), lavatory (> 85 F &< 110 F), and tube/showers (=< 110 F) meeting the requirements of ASSE. **[IPC 416.5 & IECC 504.3]**

4. Public toilet facilities cannot be accessed through kitchens and storage space. **[IPC 403.3]**

5. Provide urinal partitions between urinals except in single occupant toilet rooms. **[IPC 405]**

6. Plumbing systems shall not be located in an elevator shaft. **[IBC 3006.6]**

7. Provide primary condensate drain for evaporators and cooling coils disposed in an approved location without causing a nuisance. **[IPC 314.2 & IMC 307]**

8. Provide secondary condensate drain for evaporators and cooling coils disposed of where the drain can indicate usage and the clogging of the primary drain. **[IPC 314 & IMC 307]**

9. **Discharge of stormwater, etc., to sanitary sewer prohibited.**

   (a) No person shall discharge or cause to be discharged any stormwater, surface water, groundwater, roof runoff, subsurface drainage, uncontaminated cooling water or unpolluted industrial process waters to any sanitary sewer.
   (b) Stormwater and all other unpolluted drainage shall be discharged to such sewers as are specifically designated as combined sewers or storm sewers, or to a natural outlet approved by the city's engineering department. Industrial cooling water or unpolluted process waters may be discharged, on approval of the engineering department, to a storm sewer or natural outlet.

10. Provide roof drainage calculations. **[IPC 1107]**

11. Provide secondary roof drainage with either emergency drains or scuppers. **[IPC 1108 & IBC 1503.4**]

12. Provide secondary roof drainage as a separate system with discharge above grade**. [IPC 1108.2]**

13. Provide horizontal cleanouts not more than 100 feet apart within buildings. **[IPC 708]**

14. Provide cleanouts where changes in direction greater than 45 degrees occur. **[IPC 708.3.3]**

15. Provide cleanouts where drain and building sewer intersect. **[IPC 708.3.5]**

16. Manholes serving a building drain shall have secured gas tight cover. **[IPC 708.3.6]**

17. Building sewers less than 8 inches shall have cleanouts not more than 100 feet apart**. [IPC 708.3.2]**

18. Building sewers 8 inches and larger shall have manholes not more than 200 feet apart. **[IPC 708.3.2]**

19. Each plumbing fixture trap seal subject to loss by evaporation shall have a trap seal primer valve. **[IPC 1002.4]**

20. **Interceptors & Separators IPC 1003**

I.) GAS PIPING

1. For other than steel pipe, exposed piping shall be identified by a yellow label marked “gas” in black letters **[IFGC 401.5]** and each length of pipe or tubing and each pipe fitting utilized in a fuel gas system shall bear identification of the manufacturer**. [IFGC 401.9]**

2. Gas piping shall not be installed in or through a circulating air duct, clothes chute, chimney or gas vent, ventilating duct, dumbwaiter, or elevator shaft. **[IFGC 404.3]**

3. Gas piping shall not penetrate building foundation walls at any point below grade. **[IFGC 404.6]** See **IFGC 404.14** regarding piping underground beneath building.

4. Gas appliance shut-off requirements/location **[IFGC 409]**

5. Provide shut trip for fuel gas equipment under a Class I Kitchen Hood [**IBC 904.3.3** & NFPA 96 10.4]

6. Gas piping is permitted to be installed in accessible above-ceiling spaces, whether or not such spaces are used as a plenum. Valves shall not be located in such spaces (unless they serve gas appliances in such spaces). [NFPA 54 .3.3.4]

7. Gas lines may not penetrate firewall(s) designed/constructed to separate buildings**.[IBC 706]**

8. Furnaces and boilers installed in closets and alcoves shall be listed for such installation. **[IFGC 303.5]**

J.) FIRE SUPPRESSION

1. Penetrations of exit passageway such as steam lines, gas lines, water lines, electrical conduit, and duct are prohibited. Only sprinkler piping, standpipes, electrical conduit serving the stairwell and ductwork and other equipment necessary for smoke control are permitted. **[IBC 1022.5, IMC 607.5.5, and NFPA 101 7.1.3.2.1]**

2. Sprinkler Design Intent [NFPA 13]

2.1 For sprinkler design intent, provide engineer designed fire protection plans with preliminary hydraulic calculations. Show the general layout of sprinkler system and show main risers, related electrical connections, available water supply and design water demand. [NFPA 13]

2.2. **Tennessee licensed architect/engineer must include directly in plans that water supplies and** environmental conditions have been evaluated for the existence of microbes that contribute to microbiologically influenced corrosion (MIC). [TCA 62-2-102 and NFPA 13 23.1.5.1] The registrant of record must include an actual copy of the approved third party testing lab report (must include organic and inorganic test data). The registrant of record must include a copy of his/her report based on objective and subjective data with the rationale supporting the professional recommendation that is implemented in the design.

2.3. Identify the occupancy classification: Light, Ordinary (Groups 1 and 2), Extra (Groups 1 and 2), Special, or Mixed Commodity. [NFPA 13 5.1 through .6] Commercial kitchens must be Ordinary Group 1. Large stack rooms in Libraries must be Ordinary Group 2. Stage area must be Ordinary Group 2. Laboratories using chemicals must be Ordinary Group 1 or 2. [NFPA 45 4.2.1.1]

2.4. Provide the following information:

2.4.1. Identify the hydraulically most demanding area.

2.4.2. Provide preliminary flow and pressure demand calculations including required sprinkler pressure, elevation loss and friction losses (including device losses such as backflow preventers, etc.). [NFPA 13 11.2.3.2.1 and 14.4.4] Include hose demand.

2.4.3. Provide a water supply/system demand graph.

2.4.4. Identify the type of sprinkler system used:

2.4.4.1. Wet Pipe System [NFPA 13 7.1]
2.4.4.2. Dry Pipe System [NFPA 13 7.2]
2.4.4.3. Pre-action or Deluge System [NFPA 13 7.3]
2.4.4.4. NFPA 13 R System
2.4.4.5. Combined Sprinkler Standpipe System
2.4.4.6. Anti-Freeze System [NFPA 13 7.6]
2.4.4.7. Combined Dry Pipe, Pre-action System [NFPA 13 7.4]
2.4.4.8. NFPA 13 D System

2.4.5.Specify all areas to be sprinklered:

2.4.5.1. Elevator shafts must be sprinklered at the top and bottom of the shaft. See reference for exceptions. [NFPA 13 8.15.5.]
2.4.5.2. Provide sprinkler protection under an accessible first landing of a noncombustible stair and at the top of the stair shaft. [NFPA 13 8.15.3.2.1]

2.4.5.3. Provide sprinklers under all combustible ground floors, exterior docks, and platforms. See reference for exceptions. [NFPA 13 8.15.6]

2.4.5.4. Provide sprinklers under exterior roofs or canopies exceeding 4 ft. in width. See reference for exceptions. [NFPA 13 8.15.7] [NFPA 13 8.15.7.2,and .3 and .4]

2.4.5.5. Provide sprinklers in every aisle and tier for library stack rooms. See reference f or exceptions. [NFPA 13 8.15.9]

2.4.5.6. Provide sprinklers for electrical equipment rooms. See reference for exceptions. [NFPA 13 8.15.10]

2.4.5.7. Provide sprinklers at stages, under the stage (if combustible construction or used for storage), and at all adjacent stage areas. [NFPA 13 8.15.16.1] Where proscenium opening protection is required provide a deluge system with open heads no more than 3-feet from the stage side of the opening, and at a maximum of 6-feet on center. [NFPA 13 8.15.16.2]

2.4.5.8. Concealed spaces must be sprinklered per NFPA 13 8.15.1. This includes floor-ceilings made with composite wood joists, except where the ceiling is installed directly to the joist or with channels (max. 1”), the joist channels are firestopped into 160 cu.ft. with materials equivalent to the joist construction, and where channels are used, at least 3½” of batt insulation is installed at the joist channel. [NFPA 13 8.15.1.2.6]

2.4.5.9. For dwelling units, sprinkler bathrooms, closets, and pantries per NFPA 13 8.15.8.

2.4.6. Provide a sprinkler system riser schematic with control and check valves, supply and system pressure gauges, water flow switches, tamper supervising switches, local waterflow alarm location, and spare sprinkler head cabinet location. [NFPA 13 6.9.2 and NFPA 13 8.16]

2.4.7. Provide the total area protected of each floor for each system riser. The maximum area limitation for the provided number of risers is:

2.4.7.1. Light or ordinary hazard -52,000 sq. ft. per riser

2.4.7.2. Extra hazard -40,000 sq. ft. per riser

2.4.7.3. 25,000 for pipe schedule systems. [NFPA 13 8.2.1]

2.4.8. **Sprinkler lines cannot penetrate a four-hour firewall. These are two separate buildings and must be protected separately; separate sprinkler risers and lead-ins are required for each portion of the building. [IBC Section 705 & 712]**

2.4.9. Provide a heated space for the dry system riser. The dry-pipe valve room must be lighted and heated. The source of heat must be a permanently installed type. [NFPA 13.7.2.5.2.1]

2.4.10. Show that the system is supervised per **IBC 903.4,** NFPA 13 8.16.1.1.2 (1 and 2 only).

2.4.11. Provide tamper switches at all control valves. [**IBC 903.4]**

2.4.12. Provide a flow switch or alarm check valve and specify connection to the general building alarm (must sound within 5 minutes of flow). [NFPA 13 6.9.1] For systems protecting storage in accordance with NFPA 13 12.6, provide alarm service per NFPA 13 8.16.1.7.

2.4.13. Specify seismic restraint for piping in seismic areas required by IBC Chapter 16 Specify flexible couplings at flexure joints per NFPA 13 9.3.2.1 and, where required, clearance around piping passing through floors and walls and foundations per NFPA 13 9.3.4.

2.4.14. Provide flow test data (static psi, residual psi and gpm, who and when test was performed for the existing sprinkler system riser when additions to existing systems are made. Provide this information on the plans (two-inch main drain test). [NFPA 13 14.1.3 (30)]

2.4.15. For protection of special storage and commodities see NFPA 13 Chap. 12.

2.4.16. Specify that all system gauges and valves must be accessible for inspection and maintenance. [NFPA 13 8.1.2]

2.4.17. Where the potential exists for water pressures exceeding 175 psi, provide a pressure reducing valve meeting the requirements of NFPA 13 8.15.1.2.

2.4.18. The proposed sprinkler system solenoid valve used for elevator hoist-ways and machine rooms would have to be tested and listed for this particular application and be supervised by the fire alarm system to satisfy the code. [NFPA 13 6.1.1 and 8.15.1.1.2] The use of a stand-alone solenoid valve serving a dry system branch line for elevator hoist-ways and machine rooms is not an acceptable alternative to a pre-action sprinkler system.

2.4.19. Where a water curtain is used to protect glass walls and inoperable windows, specify that "specific application window sprinklers" be used. Provide cut sheets for the product to verify that the listing requirements can be met. Unless otherwise listed:
1) The system must be a wet system for interior use or a deluge system for exterior use;
2) The glazing must be non-operable, heat strengthened, tempered, single- or double-paned, min. ¼ inch thick;
3) Intermediate horizontal mullions are not permitted;
4) the frame must be non-combustible with a standard EPDM rubber gasket seal;
5) the maximum height of the window assembly is 13 ft.
6) heads spacing is a maximum of 8 ft. on center or within each mullion glazing segment;
7) some method must be used to keep combustibles a minimum of 2 inches from the glass.
[**State Fire Marshal's Office Policy and IBC 404.5, NFPA 101 8.6.7 (1) (c)] Atriums**

3. Standpipes:

3.1. A standpipe hose connection shall be located at each floor level at every exit stairway on each side of the wall adjacent to the exit opening of a horizontal exit. [**IBC 905.4** and NFPA 14 5.3]

3.2. Buildings in which the highest floor is greater than 30 feet above the lowest level of fire department vehicle access shall have Class III wet standpipes. **[IBC 905.3.1 see exceptions for Class I standpipes]**

3.3. Group A-Occupancy provide Class I standpipe in non-sprinklered Group A buildings with occupant load greater than 1000. **[IBC 905.3.2 see exceptions]**

3.4. Covered mall buildings shall be equipped throughout with standpipe system. See special requirements. **[IBC 905.3.3]**

3.5. Stages over 1000 square feet shall be equipped with a Class III standpipe on each side of stage; also refer to exception. **[IBC 905.3.4]**

3.6. Underground buildings shall be equipped with a Class I standpipe. **[IBC 905.3.5]**

4. Fire Pump:

4.1. Provide a fire pump schematic with all-component parts and alarms per NFPA 20.

4.2. For an electric fire pump provide two or more approved independent power sources. [NFPA 20 9.2.1.1]

5. If automatic sprinkler protection is to be provided the installation shall be placed in service as soon as practicable. **[IBC 3311 & NFPA 1 16.4.3.2.1]**

6. Areas containing dumpsters with individual capacity of 1.5 cubic yards or more shall be protected by an approved automatic sprinkler system and be enclosed with a fire-resistance rating of 1 hour. [NFPA 1 19.2.1.4.1]

7. Portable fire extinguishers **[IBC 906, NFPA 101 9.7.4,** NFPA 101 Chapter 11-43 3.5, NFPA 1 13.6.2, NFPA 1 Table 13.6.1.2, and NFPA 10]

7.1. General

7.1.1. Provide fire extinguisher in each concession stand. [NFPA 1 10.15.5]

7.1.2. Provide a minimum of 2-A: B: C fire extinguisher in each area with an internal combustion power sources. [NFPA 1 10.15.10.4]

7.1.3. K-class extinguishers are required in kitchen areas. Fire extinguishers should be serviceable so that they can be inspected and tagged on an annual basis by individuals trained by the manufacturer.

K.) FIRE DETECTION AND ALARM SYSTEMS

1. Fire safety and evacuation plans shall be provided for all occupancies and buildings where required by the International Fire Code. **[IBC 1001.4]**

2. Fire Alarm Requirements [IBC Section 907, NFPA 101 9.6 and NFPA 72]

2.1. NOTE: The fire alarm contractor shall be certified in accordance with the Tennessee Alarm Contractors Licensing Act of 1991, TCA Title 62, and Chapter 32.

2.2. In **Assembly occupancy Group A,** a fire alarm system is required with Occupancy of 300 or more. **[IBC 907.2.1 and NFPA 12.3.4.1]**

2.2.1. An emergency voice announcement/alarm system shall be provided with an approved emergency power source. **[NFPA 101 12.3.4.3 and 9.6.3.9]**

2.3. In Business occupancy Group B, a fire alarm system is required in buildings three or more stories in height above the level of exit discharge or occupancies subject to 50 or more occupants above or below the level of exit discharge or the occupancy is subject to 300 or more total occupants. **[IBC 907.2.2, NFPA 101 9.6 and, NFPA 101 38.3.4.1]**

2.4. In Educational Group E, a fire alarm system is required with an occupancy load greater than 50. **[IBC 907.2.3 and NFPA 101 14.3.4]**

2.5. In Hazardous Group H, a fire alarm system is required**. [IBC 907.2.5** and NFPA]

2.6. In Institutional Group I, a fire alarm system is required. [**IBC 907.2.6 and NFPA]**

2.6.1. Group I-1 [**IBC 907.2.6.1, IBC 907.2.10.1.2, IBC 907.2.10.1.3**,& NFPA 101]

2.6.2. Group I-2 [**IBC 907.2.6.2**, & NFPA 101]

2.6.3. Group I-3 [**IBC 907.2.6.3**, & NFPA 101]

2.6.3.1. In Day Care Occupancy, provide smoke detector system at front of doors to stairs, in corridors, lounges, recreation areas, and sleeping rooms**. [NFPA 101 16.3.4.5, IBC 907.2.3, and IBC 907.2.6]**

2.7. In Mercantile Group M, a fire alarm system is required when the occupancy exceeds 500 or there is > 100 above or below the lowest level of exit discharge. **[IBC 907.2.7** & NFPA 101]

2.7.1. M-1

2.7.2. M-2

2.7.3. M-3

2.7.4. In Bulk mercantile buildings a fire alarm system is required.[NFPA 101 3.3.27.4., NFPA 101 9.6, and NFPA 101 36.4.5.4.1]

2.8. In Residential Group R, a fire alarm system is required.

2.8.1. Group R-1 **[IBC 907.2.8 & 907.2.10.1.1**, NFPA 101]

2.8.1.1. Smoke detectors with a residential unit shall receive power from the building wiring and have a battery backup. **[IBC 907.2.10.2]**

2.8.1.2. **Carbon monoxide detection systems [IBC 908.7.1]**

2.8.1.3. Where multiple units are installed within a residential unit, they shall be interconnected such that activation of one smoke detector will activate the others within the residential unit. **[IBC 907.2.10.3**, **NFPA 101 9.6.2.10.3]**

2.8.1.4. Smoke alarms shall be installed outside or in each sleeping area and all levels of the dwelling unit including basements. **[NFPA 101 30.3.4.5.1 and 2]**

2.8.1.5. Where multiple units are installed within a residential unit, they shall be interconnected such that activation of one smoke detector will activate the others within the residential unit. **[IBC 907.2.10.3,** & NFPA 101 9.6.2.10.3]

2.8.1.6. In residential occupancies R-2 all dwelling units and sleeping units shall be capable of supporting a visible alarm**. Notification as per 2010 ADA Chapters 7 & 8 and IBC 907.5.2.2)**

2.8.2. Group R-2 **[IBC 907.2.9 7, IBC 907.2.10.1.2**, & NFPA 101]
2.8.3. Group R-3 **[IBC 907.2.9**, & NFPA 101]
2.8.4. Group R-4 **[IBC 907.2.9 7, 907.2.10.1.2**, & NFPA 101]

3. Design document requirements **[IBC 907.1.1]**
3.1. Provide fire alarm zones, sequence of operation, description, and specifications.
3.2. Each floor shall have a separate fire alarm zone not exceeding 22,500 square feet or if sprinklered matching the allowable size of the sprinkler zone with no dimension exceeding 300 feet. **[IBC 907.6 , NFPA 101 9.6.7.4]**
3.3. Floor plan indicating use of rooms
3.4. Locations of alarm-initiating and notification appliances
3.5. Alarm control and trouble signaling equipment
3.5.1. Horn/strobe devices should be wired so that the strobe(s) continue to flash when the system is silenced. [City of Brentwood Fire Marshal's Office Policy based on NFPA 72 4.4.3.7]

3.6. Annunciation
3.6.1. The fire alarm control panel or an annunciating device shall be located in an area where trouble signals can be monitored (audibly and visually). [NFPA 72 1.5.4.6 and 1.5.7.1.1] This is to be distinguished from a general alarm system. A fire alarm zone indicator panel shall be located at grade level at the normal point of fire department access **or** at a constantly attended building security control center**. [IBC 907.6 and NFPA 101 9.6.6]**

3.6.2. If the fire alarm is only required to monitor the automatic sprinkler system place the required horn/strobe and manual pull station in a functional location. [City of Brentwood Fire Marshal's Office Policy]
2.6.3 Power connection
2.6.4 Battery calculations
2.6.5 Conductor type and sizes
2.6.6 Voltage drop calculations
2.6.7 Manufacturers, model numbers and listing information for equipment, devices, and materials.
2.6.8 Details of ceiling height and construction
2.6.9 The interface of fire safety control functions

4. A fire alarm system shall be equipped with an emergency power source. [**IBC 907, IBC 908** and NFPA 72 1.5.2.6]

5. Automatic sprinkler and fire alarm systems shall be monitored by an approved supervising station in accordance with NFPA 72. **[IBC 901.6, NFPA 101 9.6.4.2 and NFPA 101 9.7.2.1]**

6. Provide shunt trip shutdown for the following:
6.1. Fuel gas equipment under a Class I Kitchen Hood **[IBC 904.3.3** and NFPA 96 10.4]
6.2. Electrical equipment under Class I Kitchen Hood **[IBC 904.3.3** and NFPA 96 10.4]
6.3. Where sprinkler systems are used in elevator machine rooms or hoist-ways, provide automatic main line shutdown without automatic reset when sprinklers within these areas are activated in accordance with NFPA 72, Section 3-9.4. **[IBC 3006.5]**

7. Initiation of the required fire alarm system shall be by manual means or by any approved fire detection devices or by any approved automatic sprinkler system installed throughout the building. **[IBC 907.6 & NFPA 101 9.6.2.1.]**

8. Provide manual fire alarm pull station(s) in the natural exit access path near each required exit and such that no location is greater than 200' horizontally_____. **[IBC 907**, **NFPA 101 9.6.2.3, and NFPA 101 9.6.2.4]**

9. All elevators shall be equipped to operate with a standardized fire service elevator key. [IBC 3003.3]

10. Actuation of any building fire alarm-initiating device shall initiate Phase I emergency recall operation on all fire service access elevators. All other elevators shall remain in normal service unless Phase I emergency recall operation is manually initiated….. [IBC 3007.2]

11. Occupant notification shall be by audible and visible signal. **[NFPA 101 9.6.3]**

12. Provide fire alarm notification for rooms/areas _____. **[NFPA 101 9.6.3, 2010 ADA Chapters 7 & 8]**

13. Fire alarm boxes shall be mounted at a maximum of 54" above finished floor for side approach and 48" above finished floor for forward approach. **[NFPA 72 5.12.4 and 2010 ADA Chapters 7 & 8]**

14. Sounding devices shall be of such character and location to alert all occupants of the building. **[NFPA 101 9.6.3]**

15. In areas not continuously occupied that contain controlling equipment, automatic smoke detection shall be provided at each control unit(s) (i.e., fire alarm control panel, etc.). Heat detection is permitted if ambient conditions prohibit installation of smoke detection. [NFPA 72 4.4.5]

16. Smoke detectors controlling hold open devices shall be located in accordance with NFPA 72 5.14]

17. Hold open devices shall release in accordance with **NFPA 101 7.2.1.8**, and shall be tied into the fire alarm system per **NFPA 101 9.6.5.2.**

18. Stairwell or elevator shaft pressurization where provided shall be tied to the fire alarm system and shall activate upon alarm**.[NFPA 101 9.6.5.2]**

19. Emergency light control where provided shall be tied to the fire alarm system and shall activate upon alarm. [**NFPA 101 9.6.5.2**]

20. Unlock electronic locks in egress path where provided shall be tied to the fire alarm system and shall release upon alarm**. [NFPA 101 9.6.5.2]**

L.) <u>ELECTRICAL</u>

1. 2012 IECC-Energy Code Compliance:

1.1. Provide an Interior Lighting Power Allowance table for building occupancy. **[IECC Table 405.5.2]**

1.2. Provide a Lighting Power Density Table for Building Exterior**. [IECC Table 405.6.2]**

1.3. Provide a Statements of Compliance for the following: **[IECC 101.5.1]**
1.3.1. Statement of Compliance for the Lighting System**. [IECC 405]**

1.4. Recessed luminaries shall meet the requirements of **IECC 402.4.8.**
1.5. **All building entrances shall be protected with an enclosed vestibule. [IECC 402.4.7]**

1.6. Lighting Controls **IECC 405.2**
1.6.1. All areas enclosed by walls shall have at least 1 manual control unless as required for security or emergency areas or stairs and corridors that are elements of the means of egress.

[IECC 405.2.1.1]

1.6.2. Provide light reduction controls by up to 50% for all areas with required lighting controls (Refer to options and exception). **[IECC 405.2.1.2]**

1.6.3. Buildings larger than 5000 sf shall be equipped with an automatic control device to shut off lighting overrides as permitted. **[IECC 405.2.2.1 & 405.2.2.2.]**

1.6.4. Exterior lighting controls shall be in place to turn off lighting when there in sufficient daylight and to reduce usage when dawn to dusk lighting is not required except that required for vehicular entrance or exits from buildings required for safety, security, or eye adaptation. **[IECC 405.2.4]**

1.7 Exit signs internally illuminated shall not exceed 5 Watts per side. **[IECC 405.4]**

2. In an ambulatory healthcare where general anesthesia or life support equipment is used Essential Electrical Systems shall be on standby as per NFPA 99 unless on battery backup or life support is used for life-support for emergency purposes only. **[NFPA 101 20.2.9.2]**

3. Emergency lighting for means of egress shall be provided in all buildings. [IBC 1006.1, **IBC 1205.5 and NFPA 101 7.9]**

4. Emergency lighting is required on the exterior of the building immediately adjacent to exit discharge doorways. **[IBC 1006.3 and NFPA 101 7.9.1.2]**

5. Emergency lighting shall have stand-by power source per **NFPA 101 7.9.2** and shall automatically activate within 10 seconds upon the failure or interruption of power that supplies normal lighting to the area. **[IBC 1006.3 and NFPA 101 7.9.2].**

6. The emergency generator shall provide power within ten seconds. **[NFPA 101 7.9.1.3]**

7. Exit signs shall be visible from all directions of travel and no point in corridor is more than 100 ft or the listed viewing distance whichever is less. **[IBC 1011, NFPA 101 7.10.1.5.2 and NFPA 101 Chapter 11 – 42 2.10]**

8. Exit signs shall have an emergency power source or be a listed self-illuminating type sign. **[IBC 1011.5. and NFPA 101 7.10.4]**

9. Recessed light fixtures in rated ceilings shall be protected or be listed for use in a rated assembly. **[IBC 714.4]**

10. A three-foot foot horizontal clearance shall be maintained from floor to ceiling in front of electrical panels of 150 volts or less. Clearance may not be used for storage and may not contain ductwork, piping, etc**. [NEC NFPA 70 110.26 and NFPA 70/NEC Table 110.26(A)(1)]**

11. Provide 3 ft clearance for 151-600 Volts Condition 1 (exposed live parts one side and no live parts or grounded parts on the other side or effectively guarded by suitable wood or other insulating materials. Insulated wire or insulated bus bars not over 300 volts shall not be considered as grounded. Clearance may not be used for storage and may not contain ductwork, piping, etc**. [NEC NFPA 70 110.26 and NEC NFPA 70 Table 110.26(A)(1)]**

12. Provide 3 ½ ft clearance for 151-600 Volts Condition 2 (exposed live parts one side and grounded parts on the other). Concrete, brick, or tile walls shall be considered as grounded. Clearance may not be used for storage and may not contain ductwork, piping, etc. **[NEC NFPA 70 110.26 and NEC NFPA 70 Table 110.26(A)(1)]**

13. Provide 4 ft clearance for 151-600 Volts Condition 3 (exposed live parts on both sides of the work space). Electrical panels, disconnects, and transformers are considered as live parts. Clearance may not be used for storage and may not contain ductwork, piping, etc. **[NEC NFPA 70 110.26 and NEC NFPA 70 Table 110.26(A)(1)]**

14. For equipment rated 1200 amperes or more exits at each end of the equipment is required with one allowed to be 2 ft by 6 ½ ft. unless there is unobstructed exit or the clearance or working space is twice that required by 110.26(A)(1). **[NEC NFPA 70 110.26 (C) (2)]**

15. Exam rooms within doctor's and/or dental offices must comply to NEC/NFPA 70 517.1

16. Electrical outlet boxes located on opposite sides of rated walls shall be separated by a horizontal distance of 24 inches**. [NFPA 70/ NEC 300.21 & IBC 714.3.2]**

17. Provide a 120 volt receptacle within 25 ft horizontally of HVAC units **NFPA-70/NEC 210.63 (weatherproof and GFI as required by NEC 210.8).**

18. Nonmetallic-sheathed cable (types NM, NMC, and NMS) shall be permitted in Type I & II construction when installed within raceways permitted to be installed in Type 1 & II construction **[NFPA-70/NEC Article 334.12]**

19. Provide balanced electrical panel load schedules. **[NFPA 70/NEC 220.3]**

20. Materials located within a plenum, regardless of whether the plenum is constructed of or bounded by combustible or noncombustible materials, must be noncombustible or must have a flame spread index of 25 or less and a smoke-developed index of 50 or less when tested in accordance with ASTM-E-84. **(IMC 602.2.1)**

21. Brentwood Requirement. 230-62 Service Equipment- is amended by adding the following provision: Unenclosed guarded service equipment shall be limited to mandatory disconnects and metering equipment. All other service equipment shall be placed in an enclosed area of a structure. This has been added to limit the electrical equipment attached to the exterior of commercial buildings. (Beautification amendment) The main disconnect and master meter are allowed to be located on the exterior of the building. It would also include individual tenant space disconnects and meters. However, it does not allow for wire-ways and other electrical equipment that is not part of disconnect or metering equipment.

22. Provide shunt trip shutdown for the following:

22.1. Electrical equipment under Class I Kitchen Hood **[IBC 904.3**, and NFPA 96 10.4]

22.2. Where sprinkler systems are used in elevator machine rooms or hoistways, provide automatic main line shutdown without automatic reset when sprinklers within these areas are activated in accordance with NFPA 72, Section 3-9.4. **[IBC 3006.5]**

23. Show the following electrical and fire alarm connections: (Could be by specifications.)

23.1. Location of connections of all air handling shutdowns.

23.2. Location of connections to the kitchen hood fire extinguishing system that activates the fire alarm system. Show other required shutdowns in the event the extinguishing system is activated.

23.3. Location of all connections to shunt trip circuit breakers and gas solenoid valves unless a mechanical gas line shut-off is specified.

23.4. Location of all connections to shunt trip circuit breakers and gas solenoid valves unless a mechanical gas line shut-off is specified.

23.5. Locations of flow switch or alarm check valve connection to the general building alarm and central station or fire department.

23.6. Locations of flow switch or alarm check valve connection to the general building alarm and central station or fire department.