GUIDE FOR PLAN SUBMITTALS FOR MULTI-FAMILY DWELLINGS PER THE 2015 IBC AND ANKENY AMENDMENTS

This guideline is designed to address certain aspects of the project that we find will/may generate questions during the plan review. This guideline is not "all encompassing" but rather identifies key points. This is in attempt to make the plan review process go quicker.

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1. ♿ Accessibility

General Note: The City of Ankeny enforces the provisions of Chapter 11 (scoping provisions) of the 2015 IBC. This includes the referenced document ANSI A117.1 – 09 edition (technical provisions).

It is the responsibility of the owner to insure that the State of Iowa provisions are being met. Questions concerning the State of Iowa accessibility requirements should be directed to Emigdio Lopez-Sanders, Design and Construction Specialist, Iowa Civil Rights Commission. Mr. Lopez-Sanders can be reached at 515-281-8046 or at emigdio.lopez-sanders@iowa.gov.

A. Identifying units: Please indicate on the plan set which units are noted as being "Type A" dwelling units as required per section 1107.6.2.2 of the IBC. The technical provisions of section 1003 ANSI A117.1-09 apply.

   In addition please identify which bathroom option type, either option "A" or option "B" is utilized in the design for the "Type B" units as noted per section 1004.11.3 ANSI A117.1-09.

   The City of Ankeny does not perform plan reviews or inspections for the State of Iowa however the City does have standards the meet or exceed those as adopted by the Iowa Civil Rights Commission. In all cases it is the responsibility of the owner to contact the State (as noted above) for any questions regarding State requirements.

B. Common Area accessibility: The public and common areas within the building are required to meet the provisions for Accessibility. This would include any laundry rooms, elevator, mail boxes, entry ways, etc. In addition the accessibility provisions extend beyond the buildings to the site. Structures such as pools, clubhouses and other amenities are required to meet the applicable provisions of Chapter 11 of the IBC and ANSI A117.1-09.

C. Communication Features: All dwelling units shall be provided with the capability to support visible alarm notification appliances in accordance with IBC Section 907.5.2.3 and Section 1006 of ANSI A117.1-09. The capability shall be allowed for the potential to connect the dwelling unit smoke alarms with the buildings fire alarm system, the replacement of audible appliances or future extension of the existing wiring from the units smoke alarm locations to required locations

for visible appliances. **NOTE: This requirement is for all units whether or not they are designated as Type A and/or Type B.**

- Listed single and multiple station smoke alarms complying with UL 217 shall be installed in accordance with the provisions of the 2015 IBC and the household fire warning equipment provisions of NFPA 72. Smoke alarms shall be addressable with sounder bases and tied into the building fire alarm system as a supervisory signal only. Mini horns are not required if notification from a building fire alarm system is through the smoke alarms with sounder bases.

- Two-way communication devices shall be installed at each landing serving the elevator. The system shall provide communication between each required location and either a fire command center or a central control point approved by the Fire Department. If the central control point is not at a constantly attended location then the system shall have a timed automatic telephone dial-out capability to a monitoring location or 911. The system shall include both audible and visible signals. The provisions of IBC section 1009.8 shall be applied. Also please refer to the provisions of Chapter 7 of ANSI A117.1-09.

D. Thresholds/Exterior Decks: If the surface material of an exterior deck, patio or balcony for a Type B unit is of an impervious material then the deck, patio or balcony is allowed to be 4 inches maximum below the floor level of the adjacent interior space. The maximum threshold height of an exterior sliding door **shall not exceed ¾"** otherwise the maximum threshold height is to be ½" for all other doors. The deck, patio or balcony for any other types of units and for permeable surfaces for Type B units shall have its finished elevation at the same elevation as the interior floor.

2. 🔥 Fire Rated Assemblies

General Note: Proposed construction of fire rated assemblies shall meet the provisions of Chapter 7 of the 2015 IBC. Several provisions throughout the code mandate when rooms, assemblies and components are required which either may not be identified in Chapter 7 or refers the designer to the provisions of Chapter 7.

Room/Space/Element*	IBC Section
Separated Occupancies	508.4.4
Incidental Uses	509.4
Special Provisions	510
Type of Construction	Table 601
Fire Separation Distances	Table 602
Fire Command Center	911.1.2

Fire Pumps	913.2.1
Enclosures under interior stairways	1011.7.3
Enclosures under exterior stairways	1011.7.4
Interior exit stairway and ramp exterior walls	1023.7
Machine rooms, control rooms, machinery spaces, and control spaces	3005.4

*All items may not be identified in the table

For the purposes of this handout the following assemblies highlighted herein are those we see with the most issues during review:

A. Roof/ceiling assemblies & Floor/ceiling assemblies: Section 711 contains the requirements for horizontal assemblies. The fire rated assembly must be designed and constructed per one of the following methods:
   1. Prescriptive Method per Section 721, or
   2. Calculated Method per Section 722, or
   3. ASTM E119 – Standard Test Methods for Fire Tests of Building Construction and Materials per section 703.2 or,
   4. ANSI/UL 263 – Standard for Fire Tests of Building Construction and Materials per Section 703.2 or,
   5. Fire-resistance designs such as those found in GA-600-2015, Fire Resistance Design Manual, Gypsum Association per section 703.3 or,
   6. Alternate protection methods as allowed per Section 104.11

   Exception: The construction supporting the horizontal assembly is not required to be fire rated as long as the following criteria is met:
   1. Building construction type is either IIB, IIIB or VB; and
   2. The horizontal assembly separating incidental uses identified in section 509 as long as the fire-resistance rating does not exceed 1 hour, or
   3. The horizontal assembly is only separating dwelling units and sleeping units per section 420.3, or
   4. The horizontal assembly at a smoke barrier constructed per section 709.

   A1. Penetrations: The provisions of section 714.4 must be met. There are 2 types of penetrations:
   - Through penetrations – through meaning a penetration into and out of the assembly such as a plumbing waste or vent stack, fire sprinkler line, a flue from a furnace, etc.
     NOTE: Several through penetrations are required to be enclosed within shafts as required per section 713, see also section 712.

- Membrane penetrations – these penetrations enter the assembly and run within the assembly construction such as a wire from a light switch to a ceiling light, a ceiling light/fan combo in the bathroom or a dryer duct.

  NOTE: Through and membrane penetration details are required to be provided. This can either be on the plans or provided via a separate submittal. Tech data and installation guidelines are required to be provided for inspection staff at time of rough in inspections. Depending on the design category special inspections by a third party may be required for these systems in accordance with IBC Section 1705.17.

A2. Ducts and Air Transfer Openings: The provisions of section 717 must be met. As with penetrations there are two types:

- Through Penetrations – A penetration through a horizontal assembly that connects not more than 2 stories is allowed to be protected with a fire damper listed for that use in the floor line as long as the occupancy is not an I-2 or I-3. Otherwise the through penetration is required to meet the provisions of section 713

  Exception: A 4" maximum diameter duct that is 26 gauge located within the cavity of a wall serving a single dwelling unit or sleeping unit and is continuous from point of origin to the exterior is allowed to penetrate three 3 without a fire damper. The total amount of all ducts shall not exceed 100 sq in per 100 sq ft of floor area and the annular space around the duct is properly protected per section 714. The grilling opening located in a ceiling of a fire rated horizontal assembly shall be protected with a ceiling radiation damper.

  NOTE: A ceiling radiation damper is not required to be installed in a grille opening (such as for a bathroom exhaust fan) if the grille opening is located in a wall cavity as opposed to being located in the floor/ceiling assembly – see also IBC section 717.6.2.1 #2.

- Membrane Penetrations – The penetration of the ceiling membrane of a floor or roof ceiling assembly must be protected with one of the following:
  a. A shaft enclosure in accordance with section 713, or
  b. A listed ceiling radiation damper (UL 555C) installed at the ceiling line where a duct penetrates the ceiling of a fire resistance rated floor or roof ceiling assembly.
  c. A listed ceiling radiation damper (UL 555C) installed at the ceiling line where there is a diffuser with NO duct attached penetrates the ceiling of a floor or roof ceiling assembly.

IMPORTANT: A fire damper is not allowed to take the place of a ceiling radiation damper. A fire damper proposed in a horizontal assembly must be tested and identified for such. The listing must identify the type of floor system that the damper is allowed to be installed in.

Exception: Ceiling Radiation dampers are not required where one of the following applies:

1. Tests in accordance with ASTM E119 or ANSI/UL 263 show that the dampers are not necessary in order to maintain the fire-resistance rating of the assembly.
2. Where exhaust duct penetrations are protected in accordance with Section 714.4.2, are located within the cavity of a wall and do not pass through another dwelling unit or tenant space.
3. Where duct and air transfer openings are protected with a duct outlet protection system tested as part of a fire resistance rated assembly in accordance with ASTM E119 or ANSI/UL 263. For details please refer to UL 263 – BXUV Guide Info: Section III #16. Air Ducts and protection systems. Please see the following link: http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/showpage.html?name=BXUV.GuideInfo&ccnshorttitle=Fire+Resistance+Ratings+-+ANSI/UL+263&objid=1074327030&cfgid=1073741824&version=versionless#SectionIIIitem16

IMPORTANT NOTES: Please review the following notes

1. If installing a floor or roof ceiling assembly per the prescriptive requirements of section 721 or the calculated requirements of section 722 a ceiling radiation damper is **NOT** allowed to be installed within the assembly. The items noted is section 714 is allowed as well as what is defined in the exception to section 717.6.1.
2. Unless specifically noted in the assembly details a ceiling radiation damper is **NOT** allowed to be installed within an assembly that is proposed per GA-600-2015 Fire Resistance Design Manual, Gypsum Association.
   ***The assemblies noted in items #1 and #2 above have not been evaluated to accept ducts and ducting materials within the assembly. Furthermore testing of these assemblies have not been conducted to confirm whether duct penetrations in the protective membrane via air inlets or outlets resists an acceptable amount of radiant heat transfer.**
3. The allowable Ceiling Radiation dampers for use in assemblies tested via ASTM E119 or ANSI/UL 263 are those specifically identified with the tested assembly. The damper manufacturer and model number is identified as part of the assembly construction. **THIS WILL BE VERIFIED DURING THE PLAN REVIEW PROCESS AS WELL AS THE DURING THE INSPECTION PROCESS. THE ARCHITECT/DESIGNER MUST CONSULT WITH THE MECHANICAL DESIGN PROFESSIONAL AS WELL AS THE MECHANICAL CONTRACTOR. COMMUNICATION BETWEEN ALL PARTIES IS CRITICAL IN ENSURING A CODE COMPLIANT ASSEMBLY.**

4. Fire dampers are NOT allowed to be installed in lieu of Ceiling Radiation dampers. Fire dampers have different design criteria.

B. Trash/Laundry chute: A shaft is required for the trash/laundry chute. It has to be constructed as a Fire Barrier per section 707 as well as meet the shaft provisions listed in section 713. The Shaft is required to be fire rated either by 1-hour or 2-hour rating depending on how many stories the shaft penetrates (IBC section 713.4). The actual shaft must open into a chute access room that is 1 hour fire rated and separated by construction as a Fire Barrier per section 707. The opening protection between the shaft and the chute access room will be either 60 minute or 90 minute fire rated depending on the rating of the actual shaft. The opening is required to be self-closing. The opening between the chute access room and the rest of the building (discharge door) is required to be 45-minute fire rated. The discharge door can be either self-closing or automatic closing. If automatic closing then it must be via smoke detector per IBC section 716.5.9.3.

NOTE: A heat activated self-closing device is permitted between the shaft and the discharge room.

The trash/laundry chute must discharge into a chute discharge room. The room is required to be of the same fire rating as that of the shaft. The construction of the room is required to meet the provisions for Fire Barriers per section 707. Any openings are required to have a fire resistance rating equal to that of the shaft. Doors shall be self or automatic closing upon the detection of a smoke detector in accordance with Section 716.5.9.3

C. Pre-rock: During construction the building may be required to have gypsum board applied in certain areas to insure the continuity of a required fire rated assembly. Some areas include but are not limited to:

- Behind tub/shower enclosures, and
- Behind bulkheads or “fake” wall assemblies, and
- Behind electrical panels/electrical/telecom equipment, and
- Within floor/ceiling and roof/ceiling assemblies where abutting a shafts such as stairs, elevator, linen/trash, etc., and
- Within floor/ceiling and roof/ceiling assemblies at draft-stopping locations
- At the ceiling lines where enclosed spaces are constructed for the concealment of plumbing piping systems such as DWV or roof drains.

There may be more areas depending on the design of the building. These areas may or may not be identified during the plan review process. Please be cognizant of these conditions.

3.  Individual Protection – 704.3

A. Protection of the primary structural frame other than columns: If the primary structural framing members, other than columns (see below), are required to achieve a fire resistance rating and supports either;
   - more than 2 floors; or
   - one floor and roof; or
   - supporting a load bearing wall; or
   - supporting a non-load bearing wall more than 2 stories high

   Shall be **individually protected** by encasement on all sides for the full length including connections to other structural members with materials having the required fire resistance rating.

   The primary structural frame consists of:
   - columns;
   - structural members having connections to columns such as beams, girders, trusses and spandrels;
   - Members of the floor or roof construction having direction connection to columns;
   - Bracing members that are essential to the vertical stability of the primary structural frame under gravity loads whether or not the bracing member carries gravity loads.

   The fire resistance rating shall be achieved by tested designs.

B. Protection of secondary members: Horizontal assemblies are permitted to be protected with a membrane or ceiling where the membrane or ceiling provides the fire resistance rating and is installed per IBC section 711.

   NOTE: Any beams located within a horizontal assembly may still be required to be individually encased and protected if the provisions of IBC 704.3 are being met unless the tested design for the horizontal assembly incorporates the beam as part of the testing.

C. Column Protection: Columns that are required to have protection to achieve a fire resistance rating must be individually encased for the full length/height including connections to other structural members. The encasement protection shall encompass each side and be continuous from top of foundation or floor/ceiling assembly below to the top of the column including through ceilings and concealed spaces.

4. Stair shafts

General Note:

A. Fire rated assembly: Required fire rated stair shafts shall meet the provisions of IBC section 1023. If the stair shaft projects beyond the horizontal plan of the building's exterior wall line then either the side walls of the stair shaft will need to be fire rated as per the stair shaft provisions or the exterior wall of the building abutting the stair shaft shall be 1-hour fire rated for a distance of 10 feet measured horizontally from the stair (IBC section 1023.7). Openings within this 10 foot area, that extends the entire height of the shaft to a point 10 feet above the top most landing or up to the roof line, shall be protected with ¾ hour assemblies.

   The walls of the stair shaft, if required to be fire rated, shall be constructed per IBC section 707. The wall shall extend from the foundation or floor below up to the underside of the floor or roof sheathing above. The wall shall be continuous through the concealed spaces such as within a floor/ceiling assembly or roof/ceiling assembly. This is critical in the design especially when the stair shaft wall abuts a dwelling unit. It is important to consider placement of floor/roof trusses or framing members, placement of any beams bearing onto the stair shaft walls and the placement of backers for the gypsum board attaching to the ceiling at the wall/ceiling joint. Please also be cognizant when the shafts are required to be 2 or more hours in fire ratings. Additional installation of gypsum board at the pre-rock/framing stage is key.

B. Storage areas: IBC Section 1011.7.3 does allow for storage underneath an interior stairway. The walls and soffit within the enclosed usable space shall be protected by 1-hour fire resistance rated construction or the fire-resistance rating of the stairway enclosure, whichever is greater. These requirements apply to enclosed and non-enclosed stairs as well as for interior and exterior stairways. **NOTE: Access to the enclosed usable space is not allowed to be from within the actual stair shaft.**

5. Energy provisions

General Note: The provisions of the 2012 International Energy Conservation Code (IECC) is required to be met as amended by the Iowa State Building Code Bureau. This is mandated per Ankeny Ordinance Sections 175.08 and 175.61. For

amendments by the State Building Code Bureau please visit:
http://www.dps.state.ia.us/fm/building/provisions/index.shtml - 661 IAC, Chapter 303.

If the building is 3 stories or less in height the building must meet the RESIDENTIAL provisions of the code. If a large assembly room or other use is that is not residential in nature and is attached must meet the COMMERCIAL provisions of the code (2012 IECC Section C101.4.6/R101.4.6).

NOTE: For this handout any code sections referenced are based on the Residential section only

The building can either meet the prescriptive provisions or the performance based provisions of the code. Any "mandatory" provisions listed within shall apply to both the performance and prescriptive method. The Total UA alternative (R402.1.4) for the building envelope is an acceptable method.

Construction is subject to 3rd Party Inspection. Reports from approved inspection agencies can be accepted as long as the agencies satisfy qualification and reliability requirements of the department.

A. Submittal Documents:
   1. Prescriptive – The plans shall provide for building envelope R-values (roofs and attics, walls, rim joist areas, foundation system, etc), opening U-values for doors and windows, and air barrier/insulation installation criteria as listed in table R402.4.1.1. In addition the provisions listed within sections R403 & R404 shall be provided on the plans.
   2. A REScheck submittal, including mechanical and electrical systems is acceptable. For more information regarding this program please visit: https://www.energycodes.gov/rescheck
   3. Performance – An Energy Analysis using the simulated energy performance method as described in section R405 is acceptable for submittal and review.
   4. Mechanical Equipment/Outside air – Heating and Cooling equipment shall be sized per ACCA Manuals J & S, the duct sizing shall be per ACCA Manual D. Documentation shall be provided indicating such.

      In addition the plans and documentation must indicate the amount of outside air being provided to the occupants per IMC table 403.3.1.1. Please insure that the energy professional and the mechanical designer coordinate the plans and documentation to coincide with one another. Submittals will be reviewed for such.

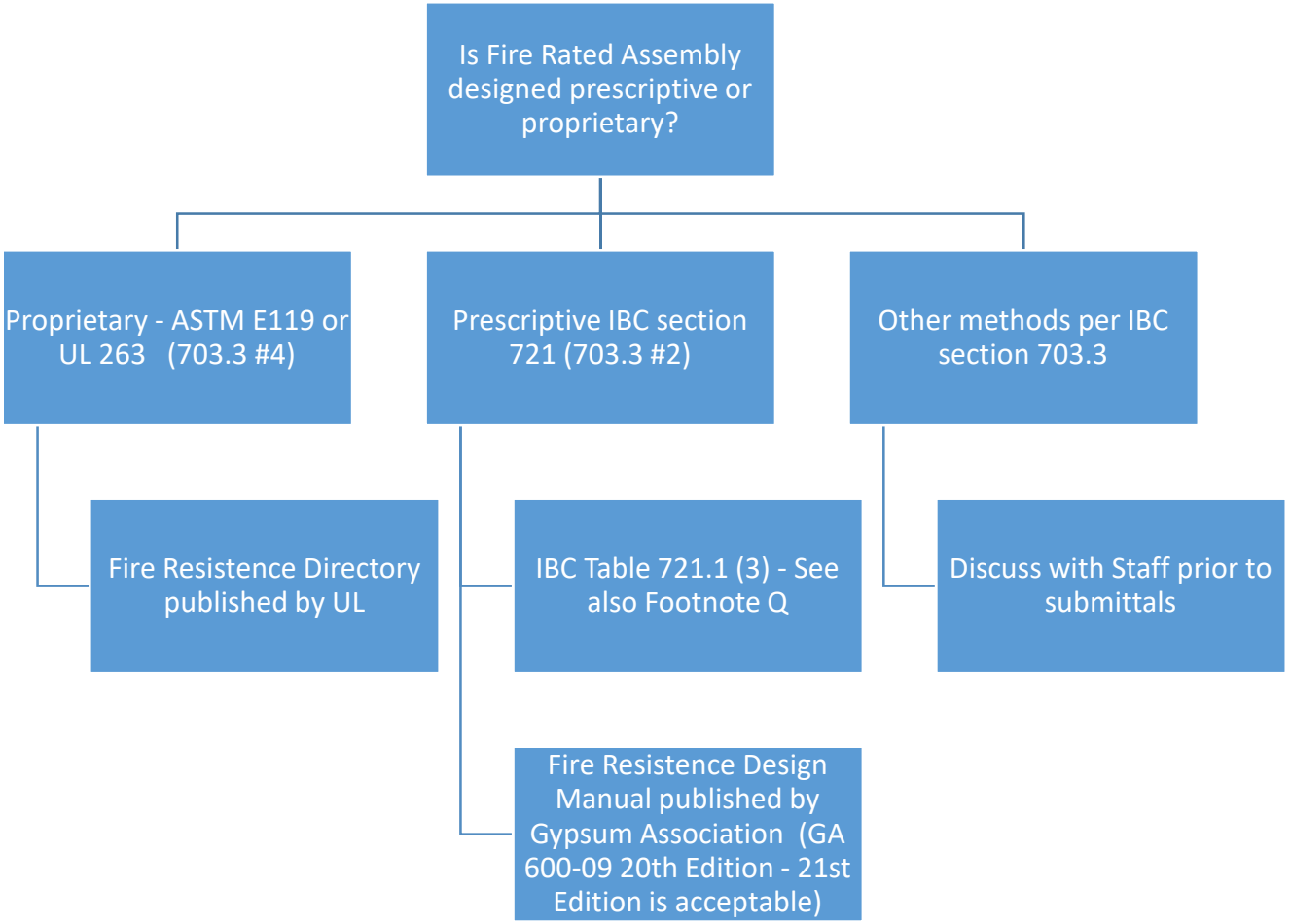
B. Inspections:
   1. 3rd party inspection and verification by energy professionals is required to be conducted during the construction process. **PLEASE NOTE:** This is still required if choosing the prescriptive method

2. Duct tightness shall be verified/tested per section R403.2.2 – STATE HAS AMENDED THIS SECTION – refer to 661-303.2
3. Any items noted as a deficiency by the 3rd party inspection agency shall be corrected and approved prior to concealment or covering.

C. Final Documents:
1. Blower door testing shall be performed. For multi-family dwelling/sleeping units a selective number of units shall be picked for testing. Blower door testing shall be performed by an approved 3rd party inspection agency. STATE HAS AMENDED THIS SECTION – total air changes per hours is 4 in lieu of 3
2. Records of inspections, installations and testing of the building envelope, appliances/mechanical and fixtures/lighting by 3rd party energy professionals

NOTE: ALL FINAL INSPECTION RECORDS SHALL BE PROVIDED TO THE OFFICE PRIOR TO A FINAL INSPECTION BEING SCHEDULED.

FIRE RATED ASSEMBLY FLOW CHART



It is important to Note which system is chosen for the Design. This is critical when deciding what type of Dampers are to be installed.

Ceiling radiation dampers – Must comply with UL555C **OR** shall be tested as part of a fire resistance rated floor/ceiling (or roof/ceiling) assembly in accordance with either ASTM E119 or UL 263. **IBC 717.3.1 #4**

Unless otherwise specified by the design, the ratings were developed based on fire tests employing no air movement. The ratings, therefore, require that air movement be effectively stopped at the start of a fire.