

A large, stylized, light blue Phoenix logo is centered on the left side of the slide. The logo is composed of several overlapping, curved shapes that form the bird's head and tail. The background of the slide is a solid, medium blue color.

# Highlighted Code Considerations for Multi-Family Housing

**City of Phoenix**



# IBC 504/506 – Height/Area Modifications

- **504 Height Modifications.**
  - NFPA 13 Sprinkler
    - +20 ft./+1 story
  - NFPA 13R Sprinkler
    - +20 ft./+1 story (max. 60 ft./4 stories)
- **506 Area Modifications**
  - 506.2 Frontage increase.
    - $I_f$  (max.  $I_f = 0.75$ )
  - 506.3 NFPA 13 sprinkler increase.
    - $I_s$  (max.  $I_s = 3$  for 1 story,  $I_s = 2$  for 2+ stories)
- Exception - Can't use Height/Area Increases **and** Table 601, Note d 1-hour fire-resistance rated construction substitution.



# IBC 506 – Building Areas

- **506.4 Single occupancy buildings**
  - 506.4.1 Area determination
    - $Aa * 2$  for buildings with two stories above grade plane
    - $Aa * 3$  for buildings with three or more stories above grade plane
      - **Exception #2.** NFPA 13R Sprinkler System (Section 903.3.1.2)
        - »  $Aa * \text{number of stories above grade plane (max 4)}$
- **506.5 Mixed occupancy buildings**
  - 506.5.1 Single Story
    - Use Section 508.1 to determine allowable area.
  - 506.5.2 Multiple Stories
    - Use Section 508.1 to determine allowable area for each story
    - Story Area/Allowable Story Area  $\leq 3$ .



# IBC 510 – Special Provisions

- **510.2 “Podium” Buildings**

- 3 hour horizontal assembly between buildings
- Podium is one story Type IA construction
- Podium is protected with NFPA 13 sprinkler
- Podium occupancy uses include S-2, B, M, R and A with occupant load  $\leq 300$  as well as incidental uses.
- Rated Shafts
- Above Podium occupancy uses include S-2, B, M, R and A with occupant load  $\leq 300$
- Maximum building height per Table 503



# Table 601 – Fire-Resistance for Building Elements

**TABLE 601  
FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)**

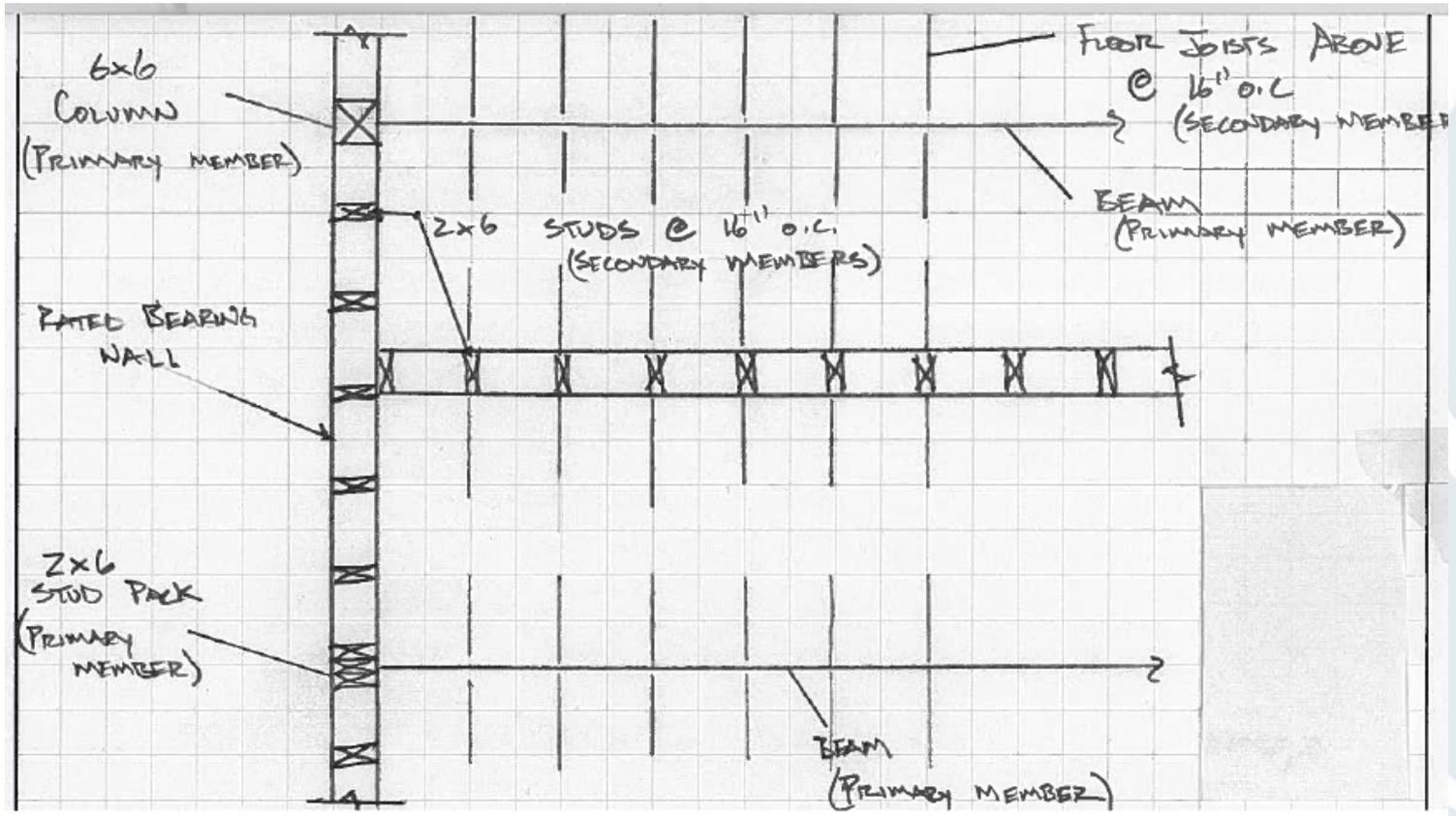
BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
	A	B	A <sup>d</sup>	B	A <sup>d</sup>	B	HT	A <sup>d</sup>	B
Primary structural frame <sup>g</sup> (see Section 202)	3 <sup>a</sup>	2 <sup>a</sup>	1	0	1	0	HT	1	0
Bearing walls									
Exterior <sup>f, g</sup>	3	2	1	0	2	2	2	1	0
Interior	3 <sup>a</sup>	2 <sup>a</sup>	1	0	1	0	1/HT	1	0
Nonbearing walls and partitions	See Table 602								
Exterior									
Nonbearing walls and partitions							See Section 602.4.6		
Interior <sup>e</sup>	0	0	0	0	0	0		0	0
Floor construction and associated secondary members (see Section 202)	2	2	1	0	1	0	HT	1	0
Roof construction and associated secondary members (see Section 202)	1 <sup>1/2</sup> <sup>b</sup>	1 <sup>b,c</sup>	1 <sup>b,c</sup>	0 <sup>c</sup>	1 <sup>b,c</sup>	0	HT	1 <sup>b,c</sup>	0

For SI: 1 foot = 304.8 mm.

- a. Roof supports: Fire-resistance ratings of primary structural frame and bearing walls are permitted to be reduced by 1 hour where supporting a roof only.
- b. Except in Group F-1, H, M and S-1 occupancies, fire protection of structural members shall not be required, including protection of roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below. Fire-retardant-treated wood members shall be allowed to be used for such unprotected members.
- c. In all occupancies, heavy timber shall be allowed where a 1-hour or less fire-resistance rating is required.
- d. An approved automatic sprinkler system in accordance with Section 903.3.1.1 shall be allowed to be substituted for 1-hour fire-resistance-rated construction, provided such system is not otherwise required by other provisions of the code or used for an allowable area increase in accordance with Section 506.3 or an allowable height increase in accordance with Section 504.2. The 1-hour substitution for the fire resistance of exterior walls shall not be permitted.
- e. Not less than the fire-resistance rating required by other sections of this code.
- f. Not less than the fire-resistance rating based on fire separation distance (see Table 602).
- g. Not less than the fire-resistance rating as referenced in Section 704.10



# What is a Column?





# IBC 704 – Fire-Resistance Rating of Structural members

- **704.2 – Column Protection**
  - Individual encasement protection on all sides for the full column length.
- **704.3 – Protection of the primary structural frame other than columns.**
  - Individual protection required when;
    - Supporting 3+ floors of framing
    - Supporting a bearing wall of any height
- **704.4 – Protection of secondary members**
  - Membrane protection permitted
- **704.4.1 – Light-frame construction**
  - Studs and boundary elements integral to the load bearing wall protected by the rated wall membrane.



# Rated Wall Assemblies

- **706 – Fire Walls**
  - Creates Separate buildings
  - Party Walls are Fire Walls
  - Detailing
    - 706.2 Structural Stability
      - Complete collapse of one side without the other
    - 706.5 Horizontal Continuity
    - 706.6 Vertical Continuity
- **707 – Fire Barriers**
  - 707.5 Continuity
    - To underside of deck
- **708 – Fire Partitions**



# IBC Chapter 10 – Means of Egress

- **Egress**
  - Exit Access
    - **EXIT ACCESS.** That portion of a *means of egress* system that leads from any occupied portion of a *building* or *structure* to an *exit*.
  - Exit
    - **EXIT.** That portion of a *means of egress* system between the *exit access* and the *exit discharge* or *public way*. Exit components include exterior exit doors at the *level of exit discharge*, *interior exit stairways*, *interior exit ramps*, *exit passageways*, *exterior exit stairways* and *exterior exit ramps* and *horizontal exits*.
  - Exit Discharge
    - **EXIT DISCHARGE.** That portion of a *means of egress* system between the termination of an *exit* and a *public way*.
- **1009.16 Stairway to roof**



# IBC Chapter 16 – Structural Design

- 2304.3.3 Shrinkage
  - Calculations and details when buildings exceed two floors and a roof
- Woodworks.org
  - Five-story Wood-frame Structure over Podium Slab
  - Wood shrinkage calculator
  - Expansion Details
  - Seismic design examples
  - Sill plate crushing



QUESTIONS ?