





2007 California Mechanical Code Marke dear expense Marke dear Mark 2007 California Plumbing Code Units and a Second Se

NEW CODES & AMENDMENTS OVERVIEW



"The only thing constant in life is change!" Francois de la Rochefoucauld



City of Newport Beach Building Department Presentation

January 29, 2008

Outline

- Presentation scope
- IBC vs. UBC
- What books do I need?
- California Building Code
- Detailed non-structural provisions
- Sample Multi-Family Dwelling Code Analysis Submittal
- Other Significant Residential Provisions
 changes
- Newport Beach Non-Structural Building Code Amendments
- Q and A

Non-Structural Provisions Objective

- Understanding Occupancy Classifications and Types of Construction
- Discussion of new definitions and concepts:
 - Fire Walls
 - Fire Barriers
 - Fire Partitions
 - Smoke Barriers
 - Smoke Partitions
- Height and Area applications
- Fire Separation Distance (setbacks)
- Automatic Fire Sprinklers
- Means of Egress

Scope of IBC

 All occupancies other than 1 and 2-family dwellings

 IRC is intended to address 1 and 2-family dwellings

The IRC is not adopted at this time.

IBC vs. UBC

• <mark>BC</mark>

- Utilize reference standards.
- One volume
- International?

• UBC

- Prescriptive provisions
- Restates standards in the code body
- Reference standards
- Three volumes
- Uniform (regional?)

What books do I need?

REQUIRED
BOOKS

2007 CBC (California Building Code) Part 2 Volume I & II Based upon the 2006 IBC International Building Code

2007 CEC (California Electrical Code) Part 3 Based upon the 2005 NEC National Electric Code

2007 CMC (California Mechanical Code) Part 4 Based upon the 2006 UMC Uniform Mechanical Code

2007 CPC (California Plumbing Code) Part 5 Based upon the 2006 UPC Uniform Plumbing Code

2007 CEC (California Energy Code) Part 6 Based upon the 2005 California Energy Commission Standards RECOMMENDED FOR

General Contractor, Designer, Architect, Engineer, etc.

Electrical Contractor, Electrician, Designer, Architect, Engineer, etc.

Mechanical Contractor, HVAC Installer, Designer, Architect, Engineer, etc.

Plumbing Contractor, Plumber, Designer, Architect, Engineer, etc.

Energy Consultant, Designer, Architect, Engineer, etc.

Be sure to fill out post card that comes with book or register on line with ICC to get updates/errata's and check Building Standards Commission website for any new errata's. 6

2007 California Building Code

- 1997 UBC
- 2001 CBC (1997 UBC w/California amendments)
- 2006 IBC
- 2007 CBC (2006 IBC w/California amendments)
- Effective dates
 - Publication date July 4, 2007
 - Enforcement date January 1, 2008

Referenced Structural Standards

Number of pages in the Structural chapters

	Siz	e of Str	uctural	Chapte	ers in th	e Code	s (pag	es)
Codes	Ch 16	Ch 17	Ch 18	Ch 19	Ch 20	Ch 21	Ch 22	Ch 23
2001 CBC (UBC)	39	4	38	88	18	35	35	106
2007 CBC (IBC)	48	16	30	11	1	30	3	76

Code Chapters and the Standards

- Chapter 16 Loads
- Chapter 19 Concrete
- Chapter 20 Aluminum
- Chapter 21 Masonry
- Chapter 22 Steel
- Chapter 23 Wood

ASCE 7-05 ACI 318-05 AA ADM 1-00 ACI 530-05/ASCE5-05/TMS 402-05 AISC 360 & AISC 341 (free from www.AISC.org) NDS-05



<u>Hint:</u>

All standards are listed alphabetically in chapter 35 and cross referenced to the specific code section.

These are structural standards that designers, architects and engineers will find they will need to have.

Must Have Structural Standards

Description

ASCE 7-05 Minimum Design Loads for Buildings & Structures

NDS 05 Wood Construction & NDS Supplement

ACI 318-05 Building Code Requirements & Commentary for Concrete

ACI 530-05 2005 Building Code Requirements for Masonry Structures

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AISC 325-05 Steel Construction Manual -13th edition

AISC 327-05 Seismic Design Manual

WTCM Wood Frame Construction Manual – 2001edition

ASTM Standards: As Referenced in the 2006 IBC

UL Referenced Standards

California Code of Regulations

- 27 Separate titles
- Title 24 is reserved for Buildings.
 - Title 24 parts are: Part 1- Admin.
 Part 2- CBC
 Part 3- CEC
 Part 4- CMC
 Part 5- CPC
 Part 6- Energy Code

Part 7- Elevator Code Part 8- Historical Code Part 9- CFC Part 10- CCBC Part 11- Reserved Part 12- Cal Ref standards

HOW TO DISTINGUISH BETWEEN MODEL CODE LANGUAGE AND CALIFORNIA AMENDMENTS

To distinguish between model code language and the incorporated California amendments, including exclusive California standards, California amendments will appear in italics.

Due to the nature of the California Building Code's first-time use of the International Building Code as the base document, symbols in the margins, previously used to indicate code changes, will not be used in this edition of the California Building Code. [BSC] This symbol within a section identifies which State agency(s), by its "acronym," has amended a section of the model code.

BSC	California Building Standards Commission
SFM	Office of the State Fire Marshal
HCD	Department of Housing and Community Development
DSA-AC	Division of the State Architect-Access Compliance
DSA-SS	Division of the State Architect-Structural Safety
OSHPD	Office of Statewide Health Planning and Development
CSA	Corrections Standards Authority
DHS	Department of Health Services
AGR	Department of Food and Agriculture
CEC	California Energy Commission
CA	Department of Consumer Affairs: Board of Barbering and Cosmetology Board of Examiners in Veterinary Medicine Board of Pharmacy Acupuncture Board Bureau of Home Furnishings Structural Pest Control Board
SL	State Librarian
SLC	State Lands Commission
DWR	Department of Water Resources

Legend of Acronyms of Adopting State Agencies

Matrix Adoption Table 11B

CALIFORNIA BUILDING CODE—MATRIX ADOPTION TABLE CHAPTER 11B—ACCESSIBILITY TO PUBLIC BUILDINGS, PUBLIC ACCOMMODATIONS, COMMERCIAL BUILDINGS AND PUBLICLY FUNDED HOUSING

Adopting Agency		BSC	SFM		HK	CD	DS	A		C	SHPD)	CSA	DHS	AGR	DWR	CEC	CA	SL	SLC
				1	2	1/AC	AC	SS	1	2	3	4							_	
Adopt Entire California Ch	napter						χ													
Adopt Entire California Ch amended (amended secti below)	napter as ons listed																		5	
Adopt only those sections listed below	that are		х																	
Chapter / Section	Codes		-																	-
1114B.2 - 1114B.2.1	CA		Х																	

In this Matrix the State Fire Marshal's adoption is applicable to HCD as well

CHAPTER 4 – SPECIAL DETAILED REQUIREMENTS BASED ON USE AND OCCUPANCY (Continued)

Adopt Entire Chapter Adopt Entire Chapter as amended (amended sections listed below)	Х	v	1	2	1/AC	AC	ss X	1. X	2	3	4					
Adopt Entire Chapter Adopt Entire Chapter as amended (amended sections listed below)	Х	v					Х	X	Y	v	N	 	 		 	
Adopt Entire Chapter as amended (amended sections listed below)		v							^		X					-
Adopt only those sections		• •	X ♦	X ◆												
that are listed below						x						х			х	
Chapter / Codes Section																
436 CA		Х												1		
439 CA		X													Х	
440 CA		Х										Х				
442 CA		Х														
443 CA		Х														
445 CA	1	Х														

The • designation indicates that the Office of the State Fire Marshal's adoption of this chapter or individual sections is applicable to structures subject to HCD 1 and/or HCD 2 or DSA-SS.

Effective Use of The IBC/CBC

Guideline on how to use the code and how provisions are related to each other.

Two Parts:

- Non-structural Provisions
- Structural Provisions

Chapter 1

- Administration
 - Similar to CBC
 - Referenced Codes & Standards
 - Alternative
 materials/methods
 - Exempt work
 - Permits
 - Plan checks
 - Inspections
- Applicability
 - Adoption by BSC

- Applicability
 - Adoption by BSC
- State Agency Statutory Authority
 - DSA/AC
 - Disabled Access
 - HCD 1
 - Dwellings/Apariments
 - HCD 2
 - Mobile Homes
 - **OSHPD 3**
 - Licensed Clinics
 - SFM
 - A, E, H, I, L, R, high-rise
- Appendices
 - Not applicable unless specifically adopted by a state agency or local jurisdiction (101.4)

Chapter 2

Definitions

- Chapter 2 only contains definitions for a small number of general terms
- Most terms are provided with a reference to the applicable code section within the CBC
- The new CBC format places most definitions within the chapter where the term is most likely to be used

Chapter 3 Use and Occupancy Classification Slightly Different

- 1. Group $A \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow$
- 2. Group $B \rightarrow \rightarrow \rightarrow \rightarrow$
- 3. Group $C \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow$
- 4. Group $E \rightarrow \rightarrow \rightarrow \rightarrow$
- 5. Group $F \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow$
- 6. Group $H \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow$
- 7. Group $I \rightarrow \rightarrow \rightarrow \rightarrow$
- 8. Group $L \rightarrow \rightarrow \rightarrow \rightarrow$
- 9. Group $M \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow$
- 10. Group $R \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow$
- 11. Group $S \rightarrow \rightarrow \rightarrow \rightarrow$
- 12. Group $U \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow$

Assembly

Business

- Organized Camps (SFM)
- Educational
- Factory and Industrial
- High Hazard
- Institutional
- Research Laboratories (SFM)
- Mercantile
- Residential
- Storage
- **Utilities and Miscellaneous**

Assembly Group A

- A-1 Motion Pictures Theaters, Concert Halls, Viewing Performances
- A-2 Restaurants & Bars, Banquet Halls, Night Clubs
- A-3 Places of Worship, Art Galleries, Conference Rooms, Libraries, Museums, Lecture Halls, "Other" Assembly
- A-4 Indoor Sporting Event Viewing, Arenas, Skating Rinks
- A-5 Outdoor Viewing Activities, Bleachers, Grand Stands, Stadiums

Assembly<50 is classified as group B

Residential Group R

- **R-1**
 - Hotels, Motels, Boarding Houses ≤30-days (transient)
- **R-2**
 - Apartments, Condos, Convents, Time Share
 - Hotels, Motels >30days (non-transient)
- **R-3**
 - 1- and 2-family
 - Congregate <17
 - Client care <24-hrs any age
- {Residential care has been added R-3.1 & R-4 (310.1)}
- **R-3.1** (licensed residential care) \mathbf{O}
 - 24-hr care for 6 or fewer clients any age (Group homes, Foster Care etc..)
- R-4
 - (Assisted living)
 - >6 ambulatory clients

Town houses with the property line between each unit are as R3. Townhouses without the property line between them are R-2.

Group U (Utility)

- Utility, Carports, Private garages, Retaining walls, and Fences more than 6 feet
- No more U 1 or U2 occupancy
- Private garages are separated from the dwelling unit and attic by ½ inch gypsum board.
- Habitable space above the garage require 5/8 type X.
- The door between the dwelling and garage is required to be self closing and *self latching*.
- Only carport floors are required to be noncombustible material.

Chapter 4

- Special Detailed Requirements Based on Use and Occupancy
 - Covered Mall Buildings (402)
 - High-Rise Buildings (403)
 - Atriums (404)
 - Underground Buildings (405)
 - Motor-Vehicle-Related Occupancies (406)
 - Group I-2 & I-2.1 (407)
 - Group I-3 (408)
 - Motion Picture Projection Rooms (409)
 - Stages and Platforms (410)
 - Special Amusement Buildings (411)
 - Aircraft-Related Occupancies (412)
 - Combustible Storage (413)
 - Hazardous Materials (414)
 - Groups H-1, H-2, H-3, H-4 and H-5 (415)
 - Application of Flammable Finishes (416)
 - Drying Rooms (417)

Chapter 4 (cont.)

- Organic Coatings (418)
- Group I-1, R-1, R-2, R-3, *R-3.1, R-4*(419)
- Hydrogen Cutoff Rooms (420)
- Group I-1, R-3.1, R-4 (425)
- Group I-4 (426)
- Horse Racing Stables (430)
- Pet Kennels (431)
- Combustion Engines and Gas Turbines (432)
- Fixed Guideway Transit Systems (433)
- Explosives (434)
- Winery Caves (436)
- Public Libraries (439)
- Group C (440)
- Group E (442)
- Group L (443)
- Large Family Day Care Homes (445)

Underground Buildings (405)

- Apply to spaces located >30 feet below the lowest level of exit discharge.
- Does not apply to sprinklered dwellings or parking garages; fixed guide way transit; stadiums; or only one small size story (< 1500 sq ft or less than 10 occupants) qualify the building.
- Must be type I construction
- All basement levels through the highest discharge level must be sprinklered.
- Compartmentation required where a floor is >60 ft below lowest level of exit discharge.
- Smoke control and fire alarm with public address system is required; standpipe; standby and emergency power are required.
- Two exits per floor.
- Stairways to smoke proof enclosures.



Underground building

Group I-1, R-1, R-2, R-3, *R*-3.1, *R*-4 (419)

- Dwelling units and sleeping rooms in other than R-3 shall be separated from each other by 1-hour <u>Fire Partitions</u>.
 - In Type IIB, IIIB and VB fully sprinklered buildings, the fire partitions may be <u>1/2-hour</u> rated (708.2)
- Townhouse units shall be considered separate buildings (419.4)
 - Adjacent townhouse units shall <u>each</u> be provided with a one-hour fire-resistance rated wall assembly separating the units, with no openings, in accordance with Section 419.4.
 - In lieu of two 1-hour walls, a common 2-hour wall may be permitted if it contains no plumbing or mechanical equipment or ducts.
 - Parapets between townhouse units shall be required in accordance with Sections 419.4.2 and 419.4.3
 - Each individual townhouse shall be structurally independent, except for foundations, common 2-hour fire-resistance rated walls, and roof and wall sheathing attached to such common₂₅ walls.

Chapter 5

- General Building Heights and Areas
 - Table 503 has larger basic allowable floor areas than UBC Table 5B

UBC	I F.R	ll F.R	ll 1 hr	II-N	III 1 hr	III-N	IV	V 1hr	V-N
IBC	IA	IB	IIA	IIB	IIIA	IIIB	IV	VA	VB

Table 503

					TYPE C	F CONSTRU	CTION				
	- F	TYPEI		TYPE II			EIII	TYPEIV	TYPE	V	
		A	В	A	В	A	В	HT	A	B	
GROUP	HGT(feet) HGT(S)	t) UL 1	160	65	55	65	55	65	50	40	
A-1	SA	UL	5 UL	3 15,500	2 8,500	3 14,000	2 8,500	3 15,000	2 11,500	1 5,500	
A-2	SA	UL	11 UL	3 15,500	2 9,500	3 14,000	2 9,500	3 15,000	2 11,500	1 6,000	
A-3	SA	UL	11 UL	3 15,500	2 9,500	3 14,000	2 9,500	3 15,000	2 11,500	1 6,000	
A-4	SA	UL	11 UL	<u>3</u> 15,500	<u>2</u> 9,500	<u>3</u> 14,000	<u>2</u> 9,500	<u>3</u> <u>15,000</u>	2 11,500	1 6,000	
	C	1.11	LII	TU	111	1 11	LIL	UL	UL	UL	

Grade Plane (New definition)

- Grade plane is defined as: a reference plane representing the average of finished ground level adjoining the building at exterior walls.
 Reference plane is measured by taking 5 feet from the building or the property line which ever is smaller.
- Height is based on stories and feet above grade plane.



General Building Heights and Area

- Basement Definition: This definition will affect the number of stories in a building.
 - Definition is based on story above grade plane.
 - A basement shall be considered as a story above grade plane where the finished surface of the floor above basement is:
 - More than 6 feet above grade plane ;or
 - More than 12 feet above the finished ground level at any point
- There are height and area increases permitted that are different from the UBC.

Height Modifications (504)

• Sprinkler Increase (504.2)

- Extra story
- 20' extra height
- In other than Groups A, E, H, I, L, R & highrise, the sprinkler increase is allowed in addition to the area increase allowed by 506.3 (SFM amendment)
- For R-2 occupancies of Type VA construction, the sprinkler increase may not exceed 4-stories or 60 feet

Area Modifications (506) $A_a = \{A_t + [A_t \times I_f] + [A_t \times I_s]\}$

- New equation to determine the allowable area per floor.
- Frontage increase applies when more than 25% of the building perimeter fronts on a 20'-wide open space. <u>Entire wall does not need to front on an open space.</u> (506.2)
- Sprinkler increase applies only when sprinkler system conforms with 903.3.1.1 (NFPA-13). (506.3)
- Group A, E, H, I, L, R and high-rise occupancies are treated differently than other occupancies

Area - Frontage Increase

- Applies to buildings with more than 25% of perimeter fronting on an open space that is at least 20' wide.
- Allows consideration of partial frontage, wherein only a portion of a building fronts on an open space.

$$I_f = \left[\frac{F}{P} - 0.25\right] \frac{W}{30}$$



For Building A: $I_{f} = [(195'/510')-0.25](W/30)$ $I_{f} = 0.132$ Note: See 506.2.1 for weighted averaging. The value of W/30 shall not exceed a value of 1 except where the building complies with 507 except for the 60-foot yards (then W/30 ≤ 2)

Area - Sprinkler Increase

• IBC:

 Where a building is equipped throughout with sprinklers conforming with 903.3.1.1, I_s shall be: I_s=2 for multi-story buildings

l_s=3 for single-story buildings

 The sprinkler increase for area is permitted in addition to the height and story increases in accordance with 504.2 • **SFM**:

- Applies only to (A, E, H, I, L, R, high-rise):
- The sprinkler increase for area is <u>not</u> permitted in addition to the height and story increases in accordance with 504.2
- For Group R-2 buildings of Type VA construction the sprinkler increase for area is permitted in addition to the height increase in accordance with 504.2

Area - Multi-Story Increase

• IBC:

- For two-story buildings multiply A_a by 2
- For three- or more stories multiply A_a by 3
- No single-story may exceed A_a
- Exceptions:
 - Unlimited area buildings (507)
 - Buildings equipped with NFPA 13-R sprinklers

- **SFM**
 - Applies only to (A, E, H, I, L, R, high-rise):
 - For two- or more stories multiply A_a by 2 instead of multiplying by 3
 - Maximum area on each mixed-occupancy floor of multi-story buildings may only be doubled (506.4.1)

Area Example

- Building A:
 - 3-stories
 - Type III-A construction
 - All floors have equal area
 - 1st floor is retail stores
 - 2nd & 3rd floors are office
 - Building is fully sprinklered



$A_a = \{A_t + [A_t \times I_f] + [A_t \times I_s]\}$

Area Example (cont.)

- Mercantile (Group M) A_t=18,500
- Office (Group B) A_t=28,500
- $I_f = [(195/510) 0.25](30/30)$
- I_f=0.132
- I_s=2
- For M Occupancy: A_a=18,500+[(18,500*0.132)]+ [(18,500*2)] A_a=57,942 sqft
- For B Occupancy: A_a=28,500+[(28,500*0.132)]+ [(28,500*2)] A_a=89,262 sqft





Unlimited Area Buildings (507)

- The following buildings are not limited in area:
 - 1-story nonsprinklered Group F-2 or S-2 when surrounded by 60' wide yards (507.2)
 - 1- or 2-story fully sprinklered (903.3.1.1) Group B, F, M or S buildings when surrounded by 60' wide yards (507.2 and 507.3)
 - Group A-1 and A-2 buildings other than type V construction with conditions
 - Note: IBC Section 507.3 has been amended in the CBC to exclude 1-story, sprinklered Group A-4 buildings from unlimited area
- 1-story Group A-3 buildings of Type I or II construction shall not be limited in area provided certain conditions are met (507.6)
- The 60' wide yards may be reduced to 40' provided certain conditions \bigcirc are met (507.5)
- See Section 507 for special circumstances that may permit unlimited area for:
 - High-hazard use groups, Aircraft paint hangars, Group E buildings, and Motion picture theaters
Height Example

- 3-story; Type VA 30,000 sqft per floor (90,000 sq.ft. total)
- No yards
- Fully sprinklered in accordance w/ 903.3.1.1
- Group B analysis: $A_t=18,000$ Frontage increase = 0 Sprinkler increase = [(18,000*2)] = 36,000 $A_a=18,000 + 0 + 36,000$ =54,000 For 3-story building: $A_{total}=54,000 * 3 = 162,000$



• Check:

 $\frac{30,000 + 30,000 + 30000}{162,000} = 0.56 \le 1.00$

 0.56 ≤ 1.00 therefore area of building is <u>acceptable</u>

Mixed Use and Occupancy (508)

Incidental use areas

- Areas incidental to major occupancy classified as part of major occupancy.
- Either separated (fire barrier) in accordance with Table 508.2 or the building shall be classified as a mixed occupancy building pursuant to 508.3 and separated per table 508.3.3
- Non-separated Uses (508.3.2)
 - Type of construction of the building based on height and area limitations of each occupancy applied to entire building.
 - Most restrictive type of construction apply.
 - All other code requirements apply to each portion based on specific use.
- Separated Uses (508.3.3 & Table 508.3.3)
 - Table 508.3.3 is similar to UBC Table 3-B
 - Fire-resistance rating of separation from Group I occupancies has been modified in the CBC
 - Separation from Group L occupancies has been added to Table 508.3.3 in the CBC
- Fire barrier is not required for accessory areas that are smaller than 10% of the main area they serve (508.3.1)

Table <u>508.2</u>

- Incidental use areas shall be classified similarly to the main occupancy in which located, or classify as a mixed occupancy building
- Table 508.2 lists the level of fireresistive separation and/or automatic fire sprinkler protection that is required for specific incidental use areas
 - Fire Barrier
 - When allowed by Table 508.2 the incidental use area may be sprinklered and separated by a smoke partition
- The CBC has been amended slightly for Group I-2 and I-2.1 occupancies, and for hazardous areas within Group E occupancies

TABLE 508.2 INCID	ENTAL USE AREAS
ROOM OR AREA	SEPARATION AND/OR PROTECTION
Furnace room where any piece of equipment is over 400,000 Btu per hour input	1 hour or provide automatic fire- extinguishing system <mark>요</mark>
Rooms with boilers where the largest piece of equipment is over 15 psi and 10 horsepower	1 hour or provide automatic fire- extinguishing system ²
Refrigerant machinery rooms	1 hour or provide automatic sprinkler system ²
Parking garage (Section 406.2)	2 hours; or 1 hour and provide automatic fire-extinguishing system
Hydrogen cut-off rooms, not classified as Group H	1-hour in Group B, F, M, S and U occupancies. 2-hour in Group A, E, I and R occupancies.
Incinerator rooms	2 hours and automatic sprinkler system
Paint shops, not classified as Group H, located in occupancies other than Group F	2 hours; or 1 hour and provide automatic fire-extinguishing system
Laboratories and vocational shops, not classified as Group H, located in Group Get I-2 <u>and I-2.1</u> occupancies	1 hour or provide automatic fire- extinguishing system ²
ISEMI Rooms or areas with special hazards such as laboratories, vocational shops and other such areas not classified as Group H. located in Group Coccupancies where hazardous materials in exempt amounts are used or stored.	<u>1 nour</u>
Laundry rooms over 100 square feet	1 hour or provide automatic fire- extinguishing system
Storage rooms over 100 square feet	1 hour or provide automatic fire- extinguishing system
Group I-3 cells equipped with padded surfaces	1 hour
Group I-2 <u>and I-2.1</u> waste and linen collection rooms	1 hour <mark>a</mark>
Waste and linen collection rooms over 100 square feet	1 hour or provide automatic fire- extinguishing system
Stationary lead-acid battery systems having a liquid capacity of more than 100 gallons used for facility standby power, emergency power or uninterrupted power supplies	1-hour in Group B, F, M, S and U occupancies. 2-hour in Group A, E, I and R occupancies 2

a. ISEMI Fire barrier protection and automatic sprinkler protection required throughout the fire area in I-2 and I-2.1 occupancies as indicated.

Table 508.3.3

TABLE 508.3.3 REQUIRED SEPARATION OF OCCUPANCIES (HOURS)

	A ^e . E				R ^d		F-2, S- U ^d	2 ^{c,d} ,	B ^ь , F-1, 1	M [⊳] , S-	H-1		H-2		H-3, H∙ 5	-4, H-
OCCUPANCY	s.	NS	s	NS	S	NS	s	NS	S	NS	S	NS	S	NS	S	NS
A ^e , E ^e	Ν	Ν	1 <u>2</u>	2	1	2	Ν	1	1	2	NP	NP	3	4	2	3ª
I	-	-	N	Ν	4 <u>2</u>	NP	4 <u>2</u>	2	4 <u>2 </u>	2	NP	NP	<mark>з <u>4</u></mark>	NP	2 4	NP
R⁴	-	-	-	-	N	Ν	1	2	1	2	NP	NP	3	NP	2	NP
F-2, S-2 ^{c,d} , U ^d	-	-	-	-	-	-	Ν	Ν	1	2	NP	NP	3	4	2	3ª
B [⊳] , F-1, M ^ь , S-1	-	-	-	-	-	-	-	-	Ν	Ν	NP	NP	2	3	1	2ª
H-1	-	-	-	-	-	-	-	-	-	-	Ν	NP	NP	NP	NP	NP
H-2	-	-	-	-	-	-	-	-	-	-	-	-	Ν	NP	1	NP
H-3, H-4, H-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Ν	NP
L	2	NP	2	N/P	4	NP	1	NP	1	NP	N/P	NP	2	NP	1	NP

f. [SFM] For Group I and F1 occupancies shall have a 3 hour separation .

Fire Resistance Requirements for Building Elements

- No fire rating required for non bearing interior and exterior walls and partitions.
- Table 601 contains the general fire-resistance rating requirements for all building elements - this is much easier to work with than UBC Table 6-A.
- No 4-hour requirements.
- 11/2 -hour roof for type IA construction.
- Footnote c has been amended in the CBC to include highrise buildings, Group A, E, I, L, R-1 and R-2 occupancies in the list of occupancies for which omission of the fire protection of structural members does not apply, even if the construction is ≥ 20 feet above the floor.

Table 601

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

	TYPE I		TYPE II		TYPE III		TYPE IV ^a	TYPE	ΞV
Building	Α	В	A ^e	В	A ^e	В	HT	A ^e	В
Element									
Structure Frame ^a	3	2	1	0	1	0	HT	1	0
Bearing walls									
Exterior ⁹	3	2	1	0	2	2	2	1	0
Interior	3	2	1	0	1	0	1/HT	1	0
Nonbearing walls and									
partitions									
Exterior				See	Table	602			
Non bearing walls and	0	0	0	0	0	0	See Section	0	0
partitions							602.4.6		
Interior									
Floor construction	2	2	1	0	1	0	HT	1	0
Including supporting									
beams and joists									
Roof Construction	1 1/2 ^c	1°	1 ^c	0°	1 ^c	0	HT	1°	0
including supporting									
beams and joists									

- a. The structural frame shall be considered to be the columns and the girders, beams, trusses and spandrels having direct connections to the columns and bracing members designed to carry gravity loads. The members of floor or roof panels which have no connections to the columns shall be considered secondary members and not part of the structural frame.
- b. Roof supports: Fire resistance ratings of structural frame and bearing walls are permitted to be reduced by 1 hour where supporting a roof only.
- c. Except in <u>high-rise buildings</u>. Group <u>A, E,</u> F-1, H, <u>I, L, M, R-1, R-2</u> 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. For high-rise buildings. Group <u>A, E, I, L, R-1 and R-2 occupancies and other applications listed in Section 111 regulated by the Office of the State Fire Marshal, fire protection of members other than the structural frame 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.</u>
- d. In all occupancies, heavy timber shall be allowed where a 1 hours or less fire-resistance rating is required.

Fire-Resistance Rating Requirements for Exterior Walls Based on Separation

- Based primarily on occupancy type.
- Highest required rating for exterior walls is 3-hours.
- In other than Type IA or Group H occupancies, exterior walls will not need to exceed a 2-hour fire-resistance rating.
- Type of construction requirements not addressed in table 602.
- Exterior bearing walls regulated by both table 601 and 602.
- Reductions in fire-resistance of nonbearing walls and partitions
 - Fire-resistance ratings determined on distance thresholds up to 30 feet
 - Note the fire separation requirements for R3

Table 602

TABLE 602

FIRE-RESISTANCE RATING REQUIREMENTS FOR EXTERIOR WALLS BASED ON FIRE SEPARATION DISTANCE^{a,e}

FIRE SEPARATION DISTANCE = X (feet)	TYPE OF CONSTRUCTION	OCCUPANCY GROUP H <u>. [</u>	OCCUPANCY GROUP F-1, M, S-1	OCCUPANCY GROUP A, B, E, F-2, I, <mark>R^I</mark> , S-2, <mark>U^{b_I}</mark>
X < 5°	All	3	2	1
5 ≤ X < 10	IA Others	3 2	2 1	1 1
10 ≤ X < 30	IA, IB IIB, VB Others	2 1 1	1 0 1	1 ^d O 1 ^d
X ≥ 30	All	0	0	0



For SI: 1 foot = 304.8 mm.

a. Load-bearing exterior walls shall also comply with the fire-resistance rating requirements of Table 601.

b. For special requirements for Group U occupancies see Section 406.1.2

c. See Section 705.1.1 for party walls.

d. Open parking garages complying with Section 406 shall not be required to have a fire-resistance rating.

e. The fire-resistance rating of an exterior wall is determined based upon the fire separation distance of the exterior wall and the story in which the wall is located.

f. Group R-3 and Group U when used as accessory to Group R-3, shall not be required to have a fireresistance rating where the fire separation distance is 5 feet or more.

Fire-Resistive Rated Construction (Ch. 7)

- This is a complex chapter that contain standards related to the materials and assemblies used for structural fire resistance and fire-resistance-rated construction separation of adjacent spaces.
- Contains many cross-references and new terms.
- Architects, designers, contractors, plan reviewers, municipal inspectors, and others involved in the design, approval and/or construction of buildings must have a <u>thorough</u> understanding of this chapter to correctly apply the CBC.

Definitions (702)

- Fire Area. The aggregate floor area enclosed and bounded by fire walls, fire barriers, exterior walls or fire-resistance-rated horizontal assemblies of a building.
- Fire Wall. A fire-resistance-rated wall having protected openings, which restricts the spread of fire and extends continuously from the foundation to or through the roof, with sufficient structural stability under fire conditions to allow collapse of construction on either side without collapse of the wall.
- Fire Barrier. A fire-resistance-rated wall assembly of materials designed to restrict the spread of fire in which continuity is maintained.
- Fire Partition. A vertical assembly of materials designed to restrict the spread of fire in which openings are protected.

Definitions (Cont.)

- Horizontal Assembly. A fire-resistance rated floor or roof assembly of materials designed to restrict the spread of fire in which continuity is maintained.
- Smoke Barrier. A continuous membrane, either vertical or horizontal, such as a wall, floor, or ceiling assembly, that is designed and constructed to restrict the movement of smoke while also providing a limited degree of fire resistance. <u>Smoke</u> <u>barriers must be either 1-hour fire resistant or 0.10-inch thick</u> <u>steel pursuant to Section 709.3.</u>
- Smoke Partition. Partitions and horizontal elements constructed to limit the transfer of smoke. <u>No fire-resistance</u> <u>rating required (710.3).</u>
- Smoke Compartment. A space within a building enclosed by smoke barriers on all sides, including the top and bottom.

Exterior Walls (704)

- Fire resistance ratings (704.5)
 - When exterior walls in other than highrise buildings, Group A, E, H, I, L and R occupancies require a fireresistance rating pursuant to Tables 601 and 602, exterior walls with a fire separation distance > 5 feet shall be rated for exposure to fire from the <u>inside</u>. If the fire separation distance is ≤ 5 feet, the wall shall be rated for fire exposure from <u>both sides</u>.
 - Regardless of fire separation distance, exterior walls in high-rise buildings, Group A, E, H, I, L and R occupancies which require a fire-resistance rating pursuant to Tables 601 and 602 shall be rated for fire exposure from <u>both</u> <u>sides</u>.



Exterior Wall Openings

 A_u < 1.0 a_u

- A= Actual area of protected openings
- a= Allowable area of protected openings
- A_u = Actual area of unprotected openings
- a_u = Allowable area of unprotected openings

- Maximum area of protected and unprotected openings permitted not to exceed values in T. 704.8.
- A new method is established which allows for the combination of both protected and unprotected openings in exterior walls, based on the fire separation distance provided.
- The total openings present must comply with eq 7-2.

Exterior Wall Openings (cont.)

TABLE 704.8 MAXIMUM AREA OF EXTERIOR WALL OPENINGS^a

	FIRE SEPARATION DISTANCE (feet)										
CLASSIFICATION OF OPENING	0 to 3 ^{f,j}	Greater than 3 to 5 ^{c,g}	Greater than 5 to 10 ^{c,e,g,h}	Greater than 10 to 15 ^{d,e,g}	Greater than 15 to 20 ^{d,g}	Greater than 20 to 25 ^{d,g}	Greater than 25 to 30 ^{d,g}	Greater than 30			
Unprotected	Not Permitted	Not Permitted ^c	10% ⁱ	15% ⁱ	25% ⁱ	45% ⁱ	70% ⁱ	No Limit ^b			
Protected	Not Permitted	15%	25%	45%	75%	No Limit ^b	No Limit ^b	No Limit ^b			

For SI: 1 foot = 304.8 mm.

a. Values given are percentage of the area of the exterior wall.

b. See Section 704.7 for unexposed surface temperature.

c. For occupancies in Group R-3, the maximum percentage of unprotected and protected exterior wall openings shall be 25 percent.

- d. The area of openings in an open parking structure with a fire separation distance of greater than 10 feet shall not be limited.
- e. For occupancies in Group H-2 or H-3, unprotected openings shall not be permitted for openings with a fire separation distance of 15 feet or less.
- f. For requirements for fire walls for buildings with differing roof heights, see Section 705.6.1.
- g. The area of unprotected and protected openings is not limited for occupancies in Group R-3, with a fire separation distance greater than 5 feet.
- h. For special requirements for Group U occupancies, see Section 406.1.2.
- i. Buildings whose exterior bearing wall, exterior nonbearing wall and exterior structural frame are not required to be fire-resistance rated by Table 601 or 602 shall be permitted to have unlimited unprotected openings.

j. Includes accessory buildings to Group R-3.

- In occupancies other than Group H, unlimited unprotected openings are permitted in the first story wall facing a street or open space with a fire separation of greater than 15 feet pursuant to Section 704.8.2
- Clarification of footnote c:

A/a + $A_u/a_u \le 1$ a = $a_u = 25\%$ of residence wall area, therefore the total area of protected and unprotected openings, including vents is limited to 25% of the wall area on each floor not including garage wall. ⁵⁰

Fire Walls (705)

- Similar to area separation walls before, with some differences: igodol
 - Party walls located on a lot line between adjacent buildings shall be constructed as fire walls with no openings (705.1.1)
- Fire walls shall not be considered to create separate buildings for the \bigcirc purpose of sprinkler system requirements, unless of 4-hour construction with no openings (705.1.2)
 - Structural stability on both sides of wall to prevent collapse under fire conditions if one side fails (705.2)
 - For other than Type V construction, fire walls shall be constructed of noncombustible materials.
- Except for party walls, fire walls may have openings when they are protected \bigcirc pursuant to 715.4
 - Aggregate width of openings may not exceed 25% of length of wall (705.8)
 - Each opening shall be limited to 120 sq.ft. unless buildings on both sides of the fire wall are fully sprinklered.
- Exterior walls that intersect fire walls shall be constructed of \geq 1-hour fire- \bigcirc resistance rated construction with ³/₄-hour opening protection for at least 4 feet on both sides of the fire wall (705.5.1). 51

Fire Walls (705) (cont.)

• Firewalls shall have a fire-resistance rating of not less than that required by Table 705.4.

TABLE 705.4 FIRE WALL FIRE-RESISTANCE RATINGS					
GROUP FIRE-RESISTANCE RATIN					
A, B, E, H-4, I, R-1, R-2, U	3ª				
F-1, H-3 ^b , H-5, M, S-1	3				
H-1, H-2	4 ^b				
F-2, S-2, R-3, R-4	2				



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- a. Walls shall be not less than 2-hour fire-resistance rated where separating buildings of Type II or V construction.
- b. For Group H-1, H-2 or H-3 buildings, also see Sections 415.4 and 415.5.

Fire Barriers (706)

- Similar to fire walls, but not required to be constructed of noncombustible materials and not required to have structural stability on either side relative to fire-related collapse.
- They are used in vertical enclosures, exit passage ways, horizontal exits, incidental use areas, to separate occupancies and create fire areas and where specifically identified in the code (atrium enclosures, control areas).
 - Supporting construction to be protected by a similar fire rating except for one-hour incidental use separations per T. 508.2 in IIB, IIIB, and VB buildings.
 - Openings protected per 715 and limited to 25% of length of wall, with a maximum single opening of 156 sq ft.
 - No limit on size or % of openings for fire doors for an exit enclosure.
 - No limit on size of openings where adjoining fire areas are fully sprinklered.

Shaft Enclosures (707) (e.g. Elevator Lobbies, Stairways, Dumbwaiters, Service shafts)

- Except as otherwise permitted by 707.2, openings through a floor/ceiling assembly shall be protected by a shaft enclosure.
- Shaft enclosures shall be constructed as fire barriers (706) or horizontal assemblies (711) or both with a fire-resistance rating as follows (707.4):
 - 2-hours when connecting 4 or more stories
 - 1-hour when connecting less than 4 stories
 - Not less than the floor assembly penetrated, but need not exceed 2-hours
- Section 707.2 lists a number of exceptions where shaft enclosures are not required.
- Please see section 707.2 for common shaft exceptions.

Elevator Lobbies

- Elevator lobby required at each floor where an elevator shaft enclosure connects *more than 2-stories in a high-rise building, Group A, E, H, I, L, R-1 or R-2 occupancy*, and more than 3-stories for all other occupancies
- Exceptions (707.14.1)
 - Lobby is not required at the street floor, provided the street floor is sprinklered.
 - In other than Group I-3 and *high-rise* buildings, enclosed elevator lobbies are not required where the building is protected by sprinklers complying with 903.3.1.1 or 903.3.1.2
 - Pressurized hoistway.
 - Complying doors at hoistway opening.

Fire Partitions

- Fire partitions shall have a fire-resistance rating of not less than 1-hour (708.3)
- Exceptions:
 - Corridors walls as permitted by Table 1017.1
 - Dwelling and sleeping unit separations in buildings of Type IIB, IIIB and VB construction that are sprinklered in accordance with 903.3.1.1 may be ½-hour
- Additional construction requirements:
 - Continuity, fireblocking & draftstopping (708.4)
 - Fire partitions in two-family dwellings need not extend through attic spaces if ceilings are protected by 5/8-inch Type-X gypsum board and an attic draft stop is provided above the fire partition. The structural framing supporting the ceiling shall also be protected by ½-inch gypsum board (708.4)
 - Openings through fire partitions (715)
 - Penetrations in fire partitions (712)
 - Joints in or between fire partitions (713)
 - Joints in two-family dwellings between fire-resistance rated wall assemblies and other construction need not comply with Section 713 (708.8)
 - Ducts & air transfer openings (716)

Fire Areas

- Purpose is to determine the need for sprinkler system based on the floor area within a fire area (903.2)
- Not related to building area.
- Where fire area concept permitted as alternative to sprinkler system, minimum required for separation established by T. 706.3.9 which is applicable to single and mixed occupancy.

TABLE 706.3.9 FIRE-RESISTANCE RATING REQUIREMENTS FOR FIRE BARRIER ASSEMBLIES BETWEEN FIRE AREAS						
OCCUPANCY GROUP	FIRE-RESISTANCE RATING (hours)					
H-1, H-2	4					
F-1, H-3, S-1	3					
A, B, E, F-2, H-4, H-5, I, M, R, S-2	2					
U	1					



Smoke Barriers (709)

- Required in I-2 and I-3 only (see also 408.6)
- 1-hour fire-resistance rating
- Must provide continuity through concealed spaces, such as those found above suspended ceilings to stop passage of smoke
- Additional construction requirements:
 - Openings through fire barriers (715)
 - Penetrations in fire barriers (712)
 - Joints in or between fire barriers (713)
 - Ducts & air transfer openings (716)
- In Group I-2, where doors are installed across corridors, a pair of opposite-swinging doors without a center mullion or horizontal sliding doors that comply with section 1008.1.3.3 shall be installed in accordance with Section 709.5

Smoke Partitions (710)

- Smoke partitions to extend tight to construction to limit transfer of smoke.
- No fire-resistance rating is required, unless required elsewhere in the code
 - In Group I-2 and I-2.1, smoke partitions shall have framing covered with noncombustible materials having an approved thermal barrier with an index of not less than 15 (710.2)
- Continuity is not required above a ceiling if the ceiling membrane is constructed to limit the transfer of smoke
- Windows and doors to be provided with smoke seals and self-closing devices only when required elsewhere in the code.
- Duct and air transfer openings shall be provided with a smoke damper complying with 716.3.2 For high-rise buildings, Group A, E, H, I, L, and R occupancies, duct openings in smoke partitions shall also be provided with a smoke damper complying with 716.3.2 (710.7)
- Smoke dampers are not required in corridor penetrations where the duct is constructed of steel not less than 0.019-inch thick and there are no openings serving the corridor

Fire Doors and Shutters

- Fire doors installed in wall assemblies to have minimum rating as shown below.
- Glazing not permitted in fire doors located in fire walls, except for horizontal exit doors having a vision panel of 100 sq inches or less with no dimension exceeding 10 inches.

TABLE 715.4 FIRE DOOR AND FIRE SHUTTER FIRE PROTECTION RATINGS						
TYPE OF ASSEMBLY	REQUIRED ASSEMBLY RATING (hours)	MINIMUM FIRE DOOR AND FIRE SHUTTER ASSEMBLY RATING (hours)				
Fire walls and fire barriers having a required fire-resistance rating greater than 1 hour	4 3 2 1 ¹ / ₂	$ \begin{array}{c c} 3 \\ 3^{a} \\ 1^{1}/_{2} \\ 1^{1}/_{2} \end{array} $				
Fire barriers having a required fire-resistance rating of 1 hour: Shaft, exit enclosure and exit passageway walls Other fire barriers	1 1	1 3/4				
Fire partitions: Corridor walls Other fire partitions	1 0.5 1 0.5	$ \begin{array}{r} $				
Exterior walls	3 2 1	$ \begin{array}{c c} & 1^{1}/_{2} \\ & 1^{1}/_{2} \\ & 3'_{4} \end{array} $				
Smoke barriers	1	1/3 b				

a. Two doors, each with a fire protection rating of 1¹/₂ hours, installed on opposite sides of the same opening in a fire wall, shall be deemed equivalent in fire protection rating to one 3-hour fire door.

b. For testing requirements, see Section 715.3.3.

Glazing in Fire Window Assemblies

- Glazing in ½-hour partitions allowed to have 0.33-hour rating (715.5)
- ¹/₄-inch wired glass in steel frame meets ³/₄-hour requirements (715.5.3)
- Wired glass panel dimensions limited by Table 715.5.3
- Non-wired glass in fire window assemblies shall be fireprotection-rated glazing (715.5.4) and shall be labeled (715.5.8)
- Fire-protection-rated glazing shall be fixed or automaticclosing (715.5.5)

FIRE WINDOW ASSEMBLY FIRE PROTECTION RATINGS					
TYPE OF ASSEMBLY	REQUIRED ASSEMBLY RATING (hours)	MINIMUM FIRE WINDOW ASSEMBLY RATINg (hours)			
Interior walls:					
Fire walls	All	NPa			
Fire barriers	>1	NPa			
Smoke barriers	1	³ / ₄			
and fire partitions	1	3/4			
Enterior malle	>1	$1^{1}/_{2}$			
Exterior walls	1	3/4			
Party wall	All	NP			

TABLE 715.5

NP = Not Permitted.

a. Not permitted except as specified in Section 715.2.

 For interior applications, fireprotection-rated glazing is limited to fire partitions and fire barriers with ≤1-hour rating in accordance with Section 715.5.7

Automatic Sprinklers (903)

- Sprinklers may be required:
 - Throughout an entire <u>building</u>; or
 - Throughout an entire <u>floor</u>; or
 - For specific <u>use areas</u> of a building; or
 - Throughout a <u>fire area</u> for an occupancy
- Sprinklers required as indicated in Section 903.2 <u>and</u> Table 903.2.13

[F] TABLE 903.2.13 ADDITIONAL REQUIRED SUPPRESSION SYSTEMS				
SECTION	SUBJECT			
914.2.1	Covered malls			
914.3.1	High rise buildings			
402.8	Covered malls			
403.2, 403.3	High-rise buildings			
404.3	Atriums			
405.3	Underground structures			
407.5	Group I-2			
410.6	Stages			
411.4	Special amusement buildings			
412.2.5, 412.2.6	Aircraft hangars			
415.6.2.4	Group H-2			
416.4	Flammable finishes			
417.4	Drying rooms			
507	Unlimited area buildings			
508.2	Incidental use areas			
1025.6.2.3	Smoke-protected assembly seating			
<u>430</u>	Horse Racing Stables			
431	Pet Kennels			
439	Public Libraries			
IFC-CFC	Sprinkler system requirements as set forth in Section 903.2.13 of the International California Fire Code			

Automatic Sprinklers (903)

- Sprinklers are required for each Group occupancy as indicated in Section 903.2
 - Group A . Throughout the occupancy (903.2.1)
 - Group E . Throughout Group E fire areas > 20,000 sq. ft. and all portions of buildings below the level of exit discharge (903.2.2)
 - Group F. Throughout the *building* (903.2.3)
 - Group H. Throughout the *occupancy;* Throughout *buildings* containing a Group H-5 occupancy (903.2.4)
 - Group I. Throughout the *building*; see Section 903.2.5 for specific exceptions; see Section 903.2.5.1 for I-3 (903.2.5)
 - Group M. Throughout the *building* (903.2.6)
 - Group R. Throughout the building (903.2.7)
 - Sprinklers are not required for 1- and 2-family dwellings; townhouses

 3-stories above grade plane; Group U
 occupancies; and Group R-3.1 under certain conditions
 - Group S. Throughout the *building* (903.2.8)

Chapter 10

- Means of egress requirements in the IBC are similar to provisions in the UBC, with some important changes.
- Three distinct parts of the means of egress system is still required:
 - Exit Access (1014)
 - Exit (1018)
 - Exit Discharge (1024)
- Some important new definitions (1002):
 - Gross Floor Area
 - Area within exterior walls exclusive of vent shafts and courts
 - No deduction for corridors, stairways, closets or interior walls/columns
 - <u>Net</u> Floor Area
 - Occupied area not including unoccupied accessory areas such as corridors, stairways, toilet rooms, mechanical equipment rooms & closets

Occupant Load (1004)

- Occupant load is based on either gross or net floor area as determined by Table 1004.1.1
- Where approved by the building official, the actual number of occupants may be used for the design occupant load even if less than determined by calculation (1004.1.1)

FUNCTION OF SPACE	FLOOR AREA IN SO FT. PER OCCUPAN
Accessory storage areas, mechanical equipment room	300 gross
Agricultural building	300 gross
Aircraft hangars	500 gross
Airport terminal Baggage claim Baggage handling Concourse Waiting areas	20 gross 300 gross 100 gross 15 gross
Assembly Gaming floors (keno, slots, etc.)	11 gross
Assembly with fixed seats	See Section 1004.
Assembly without fixed seats Concentrated (chairs only—not fixed) Standing space Unconcentrated (tables and chairs) Bowling centers, allow 5 persons for each lane including 15 feet of runway, and for editioned ages	7 net 5 net 15 net
Business ames	7 net
Courtmomeother than fixed secting	100 gross
Court come outer unan fixed seating areas	40 net
	35 net
Educational Classroom area Shops and other vocational room areas	20 net 50 net
Exercise rooms	50 gross
H-5 Fabrication and manufacturing areas	200 gross
Industrial areas	100 gross
Institutional areas Inpatient treatment areas Outpatient areas Sleeping areas	240 gross 100 gross 120 gross
Kitchens, commercial	200 gross
Library Reading rooms Stack area	50 net 100 gross
Locker rooms	50 gross
Mercantile Areas on other floors Basement and grade floor areas Storage, stock, shipping areas	60 gross 30 gross 300 gross
Parking garages	200 gross
Residential	200 gross
Skating rinks, swimming pools Rink and pool Decks	50 gross 15 gross
Stages and platforms	15 net
Warehouses	500 gross

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Egress Height

- The entire means of egress shall have a ceiling height ≥ 7'-6" (1003.2). Used to be 7-0" in CBC2001
 - Group I-2, I-2.1 and I-3 corridors and exit passageways require a ceiling height ≥ 8'-0".
- Protruding objects may extend below the minimum ceiling height, provided a minimum headroom of 80" is provided for any walking surface, and such protrusions affect ≤ 50% of the entire means of egress. Furthermore, door stops and closers may reduce the ceiling height to 78" (1003.3.1) *Below 7'-0" was not permitted in CBC 2001*.
 - In Group I-2 and I-2.1 occupancies, protruding objects shall not extend > 12" below the minimum ceiling height.
- Elevation changes in corridors or exit passageways serving nonambulatory persons in Group I-2 and I-2.1 occupancies shall be by means of a ramp or sloped walkway (1003.5)



- Egress width is determined by multiplying the total occupant load served by the egress width factors in Table 1005.1.
 - A significant reduction in required egress width is allowed for sprinklered buildings
- Multiple means of egress shall be sized such that the loss of any one means of egress shall not reduce the available capacity to less than 50% of the required capacity.
- Horizontal projections over any walking surface between 27" and 80" above the walking surface shall not project more than 4" from either side (1003.3.3).
 - Handrails may protrude 4 ¹/₂" from the wall.
 - Horizontal projections are limited to 1 ½" into the required width of Group I-2 exit access corridors serving non-ambulatory or bedridden persons (1003.3.3.1)
 - Handrails may protrude 3 ½" from the wall
 - Alcohol-based hand-rub dispensers may protrude 4" (Continued next page)

Egress Width (continued)

TABLE 1005.1 EGRESS WIDTH PER OCCUPANT SERVED

OCCUPANCY	WITHOUT S	SPRINKLER SYSTEM	WITH SPRINKLER SYSTEM a		
	Stairways (inches per occupant)	Other egress components (inches per occupant)	Stairways (inches per occupant)	Other egress components (inches per occupant)	
Occupancies other than those listed below ^b	0.3	0.2	0.2	0.15	
Hazardous: H-1, H-2, H- 3 and H-4	0.7 <u>NA</u>	0.4 <u>NA</u>	0.3 0.7	0.2 0.4	
Institutional: I-2	NA	NA	0.3	0.2	

For SI: 1 inch = 25.4 mm.

a. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.

b. [SFM] See Section 1025

Accessible Means of Egress

- Each accessible portion of a building shall be served by accessible means of egress in at least the same number as required by Sections 1015.1 and 1019.1 (1007.1)
- An exit stairway that is considered part of an accessible means of egress shall have a minimum width of 48 inches between handrails and shall either incorporate an area of refuge; or be accessed from an area of refuge or a horizontal exit. See exceptions in 1007.3.
- An elevator that is considered part of an accessible means of egress shall comply with the emergency operation and signaling device requirements of



Section 2.27 of ASME A17.1 and shall be provided by standby power. Additionally, such elevator must be accessed from either an area of refuge or a horizontal exit. *Except in open parking garage*.

- Platform lifts may be used as part of an accessible means of egress, where allowed by Section 1109.7.
- Buildings with accessible floors at 4- or more stories above or below the level of exit discharge one required means of egress is one elevator. See exceptions in 1007.2.1.

Stairways (1009)

- Stairway requirements are very similar to current UBC standards, with some changes:
 - Where an inclined platform lift or stairway chairlift serves an individual dwelling unit within a Group R-3 or R-2 occupancy, a clear width ≥ 20" must be provided (1009.1)
 - Egress stairs in a Group I-2 occupancy used for the movement of beds or litter patients must be ≥ 44" wide.
 - In a Group R-3 occupancy, no landing is required at the top of an interior flight of stairs (1009.4)
 - In a Group R-3 occupancy, no handrail is required for stairs with < 4 risers (1009.10)
 - Changes of room elevations <u>of only one riser</u> within dwelling units and sleeping units <u>in Group R-2 occupancies</u> do not require handrails (1009.10)
- Stairway floor identification signage shall meet specific size and location standards as specified in Section 1020.1.6.1
- "Alternating Tread Devices" are now permitted in the IBC under very limited circumstances (1009.9)

Handrails and Guards (1012 & 1013)

- Handrails are generally required on both sides of stairways and ramps, unless specifically exempted by Sections 1009.10 and 1010.8
- In Group I-2 occupancies, handrails shall not reduce the clear width of ramps or stairs used to move beds or litter patients to less than 44" (1012.7)
- Openings through guards shall prevent passage of a 4" diameter sphere *for the full required height of the guard (1013.3)*
 - In areas not open to the public in Group I-3, F, H or S occupancies or at access to mechanical, electrical and plumbing systems, guards shall prevent passage of a 21" diameter sphere.
 - Within individual dwelling units in Group R-2 and R-3 occupancies, guards on the sides of stair treads shall prevent passage of a 4 3/8" diameter sphere.
- Guards shall be ≥ 42" in height, except for guards that also serve as handrails in Group R-2 and R-3 occupancies, which shall have a height between 34" and 38" (1013.2)
 - For special guard height provisions in assembly seating areas, see Section 1025.14

Intervening Rooms

- Intervening spaces are permitted along an egress path, regardless of accumulated occupant load, provided such intervening spaces (1014.2):
 - Are accessory to the area served; and
 - Are not high-hazard occupancies; and
 - Provide a discernable egress path to an exit.
 - No limit on the number of intervening rooms.
 - No restriction where two or more means of egress is required.
- Intervening spaces are also permitted along egress path through a Group H, S or F occupancy, provided such intervening space are the same or a lesser hazard occupancy group.
- Egress through kitchens, storage rooms, closets and similar spaces is generally prohibited, except under specific circumstances in dwelling units and Group M occupancies.
- Egress is never permitted through a room that can be locked to prevent egress other than in a Group I-3 occupancy detention facility.
- Egress from dwelling units shall not pass through other sleeping rooms or bathrooms.
- Suites of rooms in Group I-2 occupancies require additional protection, including separation by a 1-hour fire-barrier, which restrict egress. See Section 1014.2.2
Common Path of Egress Travel (1014.3)

• New concept in IBC which may:

- Require addition of a second exit
- Necessitate an automatic sprinkler system
- Result in reduced room size
- "Common Path of Egress Travel" is defined as "portion of exit access which the occupants are required to traverse <u>before two separate and distinct paths of</u> <u>egress travel to two exits are available</u>" Section 1002.1.
- When allowable distance along a common path of egress travel is exceeded, a second exit is required to reduce such length.

Common Path of Egress Travel

Common Path of Egress Travel			
Occupancy	Special Conditions	Maximum Distance	
	Fixed seating, < 50 occupants	75'	
A	Fixed seating, ≥ 50 occupants	30'	
	For smoke-protected assembly seating	50'	
H-1, H,2, H-3		25'	
1-3	1 I	100'	
B,F,S	Fully sprinklered building	100'	
B, S, U	Occupant load ≤ 30	100'	
R-2	Fully sprinklered building	125'	
All other occupancies		75'	



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Number of Exits

- New distinction under the IBC between the number of required exits from:
 - Room/occupied space (1015.1)
 - Story (1019.1)
 - Buildings (1019.2)
 - Buildings with one exit:
 - Table 1019.2
 - <u>R-3</u>
 - Single level building complying with 1015
- The minimum number of exits required shall be maintained until arrival at grade or the public way

Exits from Room

• Two exits required if:

- Occupant load of room > Table 1015.1
- Common path of egress travel distance is exceeded
- Otherwise required by Section 1015.1
- In holding cells, such as are found in courthouse buildings, if occupant load > 20
- Three or more exits required if:
 - Occupant load exceeds the story limits set forth in Section 1019.1
- In sprinklered building the minimum exit access separation distance to be 1/3 of the maximum overall diagonal.

SPACES WITH ON	E MEANS OF EGRESS	
OCCUPANCY MAXIMUM OCCUPANT L		
A, B, Eª, F, M, U	49	
H-1, H-2, H-3	3	
H-4, H-5, I-1, I-3, I-4, R	10	
S	29	



Exits from Story

- Each <u>story</u> shall be provided with the minimum number of approved independent exits required by Table 1019.1, except as modified by Section 1019.2 relating to exits from a <u>building</u>.
- Occupied roofs shall be provided with exits as required for stories (1019.1)

TABLE 1019.1 MINIMUM NUMBER OF EXITS FOR OCCUPANT LOAD		
OCCUPANT LOAD (persons per story)	MINIMUM NUMBER OF EXITS (per story)	
1-500	2	
501-1,000	3	
More than 1,000	4	

- Parking structures shall have at least 2 exits from each parking tier, unless vehicles are mechanically parked.
 - Vehicle ramps shall not be considered exits unless pedestrian facilities are provided (1019.1.1)

Exits from Building

- <u>Buildings</u> shall maintain the minimum number of exits as determined by the occupant load of each <u>story</u>, except only one exit shall be required in buildings as follows:
 - Buildings described in Table 1019.2, when limited to not more than one level below the first story above grade plane.
 - Group R-3 occupancies
 - 1-story buildings with the occupied space at the level of exit discharge, provided such occupied space complies with Section 1015.1 as a space with one means of egress.

TABLE 1	019.2 BUILDINGS	WITH ONE EXIT
OCCUPANCY	MAXIMUM HEIGHT OF BUILDING ABOVE GRADE PLANE	MAXIMUM OCCUPANTS (OR DWELLING UNITS) PER FLOOR AND TRAVEL DISTANCE
A, B ^d , E ^e , F, M, U	1 Story	49 occupants and 75 feet travel distance
H-2, H-3 <u>, <mark>L.</mark></u>	1 Story	3 occupants and 25 feet travel distance
H-4, H-5, I, R	1 Story	10 occupants and 75 feet travel distance
<u> -2, -2,1</u>	1 Story	7 occupants and 50 feet travel distance
S*	1 Story	29 occupants and 100 feet travel distance
B ^b , F, M, S ^a	2 Stories	30 occupants and 75 feet travel distance
R-2	2 Stories ^c	4 dwelling units and 50 feet travel distance

Corridors (1017)

- No specific designation for hallways
- Fire resistance is based on:
 - Occupancy served
 - Occupant load
 - Sprinklers
- Width sufficient to satisfy minimum egress width pursuant to Section 1005.1, but not less than 44", except as follows:
 - 24" for access to equipment
 - 36" for occupant load < 50
 - 36" within a dwelling unit
 - 72" for a Group E corridor with required capacity \geq 100
 - 72" for a Group I outpatient surgical facility where patients are rendered incapable of self-preservation
 - 96" for a group I-2 area where beds are moved
 - 96" for any area serving non-ambulatory persons

Corridor Fire Rating

TABLE 1017.1 CORRIDOR FIRE-RESISTANCE RATING

	OCCUPANT LOAD SERVED BY	REQUIRED FIRE-RESISTANCE RATING (hours)			
OCCUPANCY	CORRIDOR	Without sprinkler system	With sprinkler system ^c		
H-1, H-2, H-3 <u>, </u>	All	Not Permitted	1		
H-4, H-5	Greater than 30	Not Permitted	1		
A ^d , B, <mark>E,</mark> F, M, S, U	Greater than 30	1	0		
R	Greater than 10	Not Permitted	0.5 <u>1</u>		
I-2ª, 1-2.1, I-4	All Greater than 6	Not Permitted	0_1		
I-1, I-3	All-Greater than 6	Not Permitted	1 ^b		
<u>E</u>	Greater than 10	1	1		

a. For requirements for occupancies in Group I-2, see Section 407.3.

b. For a reduction in the fire-resistance rating for occupancies in Group I-3, see Section 408.7.

c. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 where allowed.

d. [SFM] See Section 1025

• Walls shall be fire partitions

- No fire-resistance rating required for:
 - Group E where classrooms all have an exterior exit door and assembly rooms have ½ of all exits as exterior exit doors at grade level.
 - Within a dwelling unit or sleeping unit of Group R
 - In open parking garages
 - In Group B occupancy where only 1 exit is required

• Fire rated corridors shall not be used for supply/return air movement (1017.4) 80

Dead End Corridors (1017.3)

- Where 2 or more exits are required in a corridor, dead ends shall be limited to 20' except as follows:
 - In Group I-3 occupancies, under certain conditions, dead ends shall be ≤ 50'
 - In Group B and F occupancies that are fully sprinklered, dead ends shall be ≤ 50'
 - Dead ends shall not be limited in length where the length < 2.5 times the least width of the dead end portion of the corridor.

Exit (1018)

- Exit is that portion of a means of egress system which is separated from other interior spaces of a building or structure by fire-resistance-rated construction and opening protection as required to provide a protected path of egress travel between the exit access and the exit discharge.
- The exit may include any of the following:
 - Exterior exit doors at ground level (1008)
 - Exit enclosures (1020)
 - Exit passageways (1021)
 - Horizontal exits (1022)
 - Exterior exit ramps and stairways (1023)

Exit Continuity (1019)

- The level of exit protection shall not be reduced until arrival at the exit discharge (1018.1)
- The required number of exits from any story, basement or space shall be maintained until arrival at grade or the public way (1019.1)
- Exits shall be continuous from the point of entry into the exit to the exit discharge (1019.3)

Exit Discharge (1024)

- "Exit Discharge" is that portion of a means of egress system between the termination of an exit and a public way.
- Exits shall discharge directly to the exterior of the building at grade or provide direct access to grade and <u>shall not re-enter</u> <u>a building</u> (1024.1)
 - Up to 50% of the number and capacity of exit enclosures may pass through areas on the level of discharge when certain conditions are met.
 - Up to 50% of the number and capacity of exit enclosures may pass through a vestibule when certain conditions are met.
 - Stairways in open parking garages may pass through the open parking garage at the level of exit discharge.

Exit Discharge

- Exit discharge capacity must be ≥ the capacity of all exits served (1024.2)
- Exterior balconies, stairways and ramps shall be located ≥ 10 feet from property lines and other buildings on the same lot unless such adjacent buildings have exterior walls and openings protected in accordance with Section 704 (1024.3)
- Exit discharge shall be open to minimize accumulation of smoke (1024.4)
- Egress courts shall be wide enough to meet the required egress width based on occupant load, and shall be ≥ 44" for other than Group R-3 and U occupancies, which are allowed to be 36" wide.
- Where access to a public way cannot be provided, a safe dispersal area shall be provided in accordance with Section 1024.6.
 - For Group E buildings, the safe dispersal area shall be on the same lot and must be located at least 50 feet away from <u>any</u> buildings.

Emergency Escape and Rescue (1026)

- Similar to current UBC requirements
- Required from basements and sleeping rooms below the fourth story in Group R and I-1 occupancies
 - Not required from small basements without habitable space, or with ceilings lower than 80" high.
- Minimum size of 5.7 sqft with a minimum clear height of 24" and a minimum clear width of 20", except as follows:
 - The minimum size of grade-floor level openings is 5.0 sqft (1026.2)
- Maximum sill height of 44" above the floor
- The CBC eliminates two exceptions from the IBC, which would otherwise eliminate the requirement for emergency escape windows from some buildings equipped with automatic sprinklers or having a door that leads to a fire-rated corridor (1026.1)
- Obstructions to emergency escape windows and exit doors, including security bars, shall comply with Section 1026.4.
 - Openable from the inside without special knowledge or effort
 - Release mechanism must be maintained operable at all times

Chapter 12

- Ventilation of attic, under-floor and interior spaces has been consolidated into Section 1203
- Natural ventilation has been reduced slightly from 5% of the floor area to 4%
 - Natural ventilation through an adjoining room is permitted if the wall between the adjoining rooms has an opening ≥ 8% of the floor area of the interior room but not less than 25 sqft.
- Natural light has been reduced slightly from 10% of the floor area to 8%
 - Natural light through an adjoining room is permitted if the wall between the adjoining rooms is at least 50% open, and the opening is ≥ 10% of the floor area of the interior room but not less than 25 sqft.
- Artificial light is now required and must be sufficient to provide an average illumination of 10 foot-candles measured 30" above the floor (1205.3)
- Stairways require a minimum average illumination intensity of 1 foot-candle measured on the treads (1205.4)
- Minimum room dimensions are similar to UBC standards (1208)

Sample Multi-Family Dwelling Code Analysis Submittal

CODE DATA

AREA INCREASE DUE TO FRONTAGE FOR BUILDINGS TYPE B, (IBC 506.1 506.2): BUILDING #4(C1)

BUILDING #4(C1)	BUILDING #1(B2)				
BASIC ALLOWABLE AREA PER TABLE 503: 7,000 SF.	BASIC ALLOWABLE AREA PER TABLE 503: 7,000 SF.				
INCREASE DUE TO FRONTAGE = $\begin{bmatrix} 411' \\ 480' \end{bmatrix} - 0.25 = \frac{30}{30}$	INCREASE DUE TO FRONTAGE = $\begin{bmatrix} 365' \\ 480' \end{bmatrix} - 0.25 = \frac{30}{30}$				
INCREASE DUE TO FRONTAGE = 62%	INCREASE DUE TO FRONTAGE = 51.6 %				
ADJUSTED ALLOWABLE AREA= 7,000 SF. + [7000 (.48)] + [7000 (0)]	ADJUSTED ALLOWABLE AREA= 7,000 SF. + [7000 (.516)] + [7000 (0)]				
ADJUSTED ALLOWABLE AREA= 11,340 SF.	ADJUSTED ALLOWABLE AREA= 10,612 SF.				
PLUMBING FIXTURES: (IBC TABLE 2902.1, BUSINESS) FIRE REQUIREMENTS:	$\begin{tabular}{lllllllllllllllllllllllllllllllllll$				
	FIRE ALARM AUDIBLE AND VISIBLE ALARMS REQUIRED PER IBC SEC 907.9.1 & 907.9.2 BY SEPARATE PERMIT. APARTMENT BUILDINGS AND CARRIAGE HOUSES TO BE EQUIPPED WITH (1) PORTABLE FIRE EXTINGUISHER PER UNIT. CLUBHOUSE EQUIPPED WITH (2) PORTABLE EXTINGUISHERS. SEE FLOOR PLAN. PORTABLE EXTINGUISHERS TO BE 2A-10B-C (5 lbs.) SEMI-RECESSED IN CABINET STANDPIPES TO BE PROVIDED AT EACH FLOOR IN ORDER TO MAINTAIN MAXIMUM 200' DISTANCE FROM ANY POINT IN BUILDING TO NEAREST FIRE DEPARTMENT HOSE CONNECTIONS. NO FIXED OR MOVING GATE SECTION SHALL INTERFERE WITH MINIMUM FIRE DEPT. ACCESS WIDTH, TURNING RADII OR OTHERWISE IMPEDE APPARATUS MOVEMENT, USE OF FIRE HYDRANTS ETC. THIRD PARTY MONITORING OF FIRE SPRINKLER SYSTEM IS REQUIRED PER FIRE CODE SECTION 904.3.1 FIRE DEPARTMENT CONNECTION FOR A BUILDING SPRINKLER SYSTEM IS TO COMPLY WITH CLARK COUNTY REGULATIONS. FIRE APPARATUS ACCESS IS REQUIRED TO BE UNOBSTRUCTED, NOT LESS THAN 16' WIDE AND 14' CLEAR HEIGHT.				

CODE DATA						
PROJECT ADDRESS:						
PROJECT DESCRIPTION:	APARTMENT (CONTAINING MAINTENANG DWELLING U	COMPLEX WIT 3 1, 2 & 3 BEDR CE FACILITY AN NITS ARE TYPE	"H 10 APARTME OOM APARTME ID 1 SWIMMING E 'A' ACCESSIBL	NT BUILDINGS NTS), CLUBHO POOL. 2% OF E PER IBC 110	DUSE, ALL 07.6.2.	
BUILDING CODES:	ALL CONSTR AND AMENDI 2006 IBC 2006 UN 2006 IFC	UCTION SHALL MENTS PER TH C 2006 II MC 2005 N C 2006 U	. Comply with IEIR Adopting ECC IEC/ NFPA IPC	THE FOLLOW	ING CODES	
	ALL PRODUCTS LIS MANUFACTURE'S V ALSO HAVE ICBO / NATIONALLY RECO	VRITTEN INSTRUCTION VRITTEN INSTRUCTION VPPROVED EVALUATING GNIZED TESTING AGE	MBERS SHALL BE INST NS. PRODUCT SUBST ON REPORTS OR BE A INCIES.	ALLED PER THE REP ITUTIONS FOR PRODU PPROVED & LISTED B	UCTS LISTED SHALL Y OTHER	
PARCEL NUMBER:	161-28-401-01	2				
GROSS SITE AREA: NET SITE AREA:	329,539 SF (1 296,232 SF (1	7.56 ACRES) 6.80 ACRES)				
ZONING:	C-2 (GENERA		L)			
OCCUPANCY CLASSIFICATION:	R-2	(BUILDINGS A1	, B1)			
	R-2, U	(BUILDINGS B3	3, C1, CARRIAO	GE HOUSE E)	SEPARATED USE	E PER IBC 508.3.3
	R-2, B U	(BUILDING B2) (MAINTENANC	NON-SEPARA	TED USE PER 2	2006 IBC SEC 508	1.3.2
CONSTRUCTION TYPE:	TYPE V-B (B		B1 B2 B3 C1 (ISE E)	
CONSTRUCTION TIPE.	TYPE V-B (M	AINTENANCE E	3LDG.)	DAMARDE NO.	00L L)	
					BASIC	
BUILDING AREA: (PER FLOOR)	LIVABLE PER FLOOR	BALCONY* PER FLOOR	BREEZEWAY PER FLOOR	TOTAL PER FLOOR	ALLOWABLE TABLE 503	ALLOWABLE PER INCREASE
BUILDING TYPE A	1 3,751	536	412	= 4,699 SF	7,000 SF	NO INCREASE
** BUILDING TYPE B	1 7,506	935	824	= 9,265 SF	7,000 SF	10,612 SF
** BUILDING TYPE B	2 8,773	935	824	=10,307 SF	7,000 SF	10,612 SF
~ ** BUILDING TYPE B	3 7,506	935	824	= 9,265 SF	7,000 SF	10,612 SF
	F 714	940		= 1 040 SF	7,000 SF	NO INCREASE
MAINTENANCE BLI	DG 405	-		= 405 SF	5,500 SF	NO INCREASE
					-	
* = BALCON ** = AREA IN ~ = GROUP I	Y AREAS VARY F CREASE PER IBC J PORTION SEP/	SEC. 506.1 506 RATED INTO (3)	5.2 FIRE BARRIER A	REAS OF LESS	THAN 1,000 SF EAC	'.
BUILDING AREA:						
BUILDING #		BALCONY ³	BREEZEWAY	GARAGES	τοται	
	2 23.785	2.805	2 472	-	29.062	
2 BUILDING TYPE B	1 22,518	2,805	2,472	-	27,795	
3 BUILDING TYPE B	3 22,518	2,805	2,472	3,753	31,548	
4 BUILDING TYPE C	1 25,752	2,805	2,472	4,292	35,321	
5 BUILDING TYPE C	1 25,752	2,805	2,472	4,292	35,321	
6 BUILDING TYPE B	3 22,518	2,805	2,472	3,753	31,548	
	1 11.253	1.608	1.236	-	14.097	
9 BUILDING TYPE A	1 11,253	1,608	1,236	-	14,097	
10 CARRAIGE HOUSE	E1 841	87		646	1,574	
11 MAINTENANCE BL	DG 405	-	-	-	405	
TOTAL	167,436	20,220 ^a	17,304	17,382	222,342	
COVERED PARKIN	G STRUCTURE	S		15,336	15,336	
GRAND TOTAL				05 045 1 000 0	237,678	
LOT COVERAGE:	BLUG. FOO	IPRINTS / NET	OTE AREA =	00,240 / 296,2	202 = 20.1%	
a = BALCONY AREAS ARE AR	PPROXIMATE.					

UNIT AREAS (LIVABLE):	TYPE 1 753 SF. 1 BEDROOM TYPE 4 753 SF. 1 BEDROOM TYPE 1a 753 SF. 1 BEDROOM TYPE 5 1122 SF. 2 BEDROOM TYPE-2 1122 SF. 2 BEDROOM TYPE 6 1292 SF. 3 BEDROOM TYPE 2a 1122 SF. 2 BEDROOM CH 1 841 SF. 1 BEDROOM TYPE 3 1292 SF. 3 BEDROOM CH 1 841 SF. 1 BEDROOM
MEZZANINE AREA: (IBC 505.2)	MEZZANINES SHALL BE NO MORE THAN 1/3 OF THE MAIN LEVEL FLOOR AREA. CH 1 1 BEDROOM UNIT AT CARRIAGE HOUSE MAIN LEVEL = 383 SF MEZZANINE = 127 SF = 33% < 33% O.K.
BUILDING HEIGHT: (IBC TABLE 503, 504.2)	ALLOWABLE: 47' & 2 STORIES SPRINKLER INCREASE: ADDITIONAL 20' & 1 STORY = 60' & 3 STORIES ACTUAL: MAX PROPOSED = 40'-8" < 60' O.K.
FIRE RESISTANCE: (IBC TABLE 601)	BEARING WALLS - EXTERIOR0 - PER IBC TABLE 602, SEE BELOWBEARING WALLS - INTERIOR0NON-BEARING WALL - EXTERIOR0NON-BEARING WALL - INTERIOR0FLOOR CONSTRUCTION0ROOF CONSTRUCTION0EXTERIOR CORRIDORS1/2 HOUR, 20 MINUTE DOORS
EXTERIOR CORRIDORS: (IBC TABLE 1016.1)	1/2 HOUR RATED, 20 MINUTE DOORS
SEPARATIONS FROM P.L.: (IBC TABLE 602)	< 5' 1 HOUR > 5' - < 10' 1 HOUR > 10' - < 30' 0 > 30' 0 ALL BUILDINGS ARE > 10' FROM REAL AND ASSUMED PROPERTY LINES - NO RATED EXTERIOR WALLS REQUIRED
ALLOWABLE WALL OPENINGS: (IBC TABLE 704.8)	UNLIMITED PER EXCEPTION G OF IBC SECTION 704.8
FIRE PARTITIONS: (IBC 708.1, 708.3)	WALLS SEPARATING DWELLING UNITS (COMMON WALLS) ARE REQUIRED TO BE 1 HOUR RATED PER PARTITION TYPE 5 OF PARTITION SCHEDULE SHEET A0.5
EXIT TRAVEL DISTANCE: (PER IBC TABLE 1015.1)	ALLOWED = 250' MAX PROPOSED = 155' < 250' O.K.
ACCESSIBILITY: (IBC 1107.6.2)	TYPE 'A' REQUIRED: 2% OF TOTAL UNITS .02 x 356 = 7 TYPE 'A' PROVIDED: 7 = 7 O.K. TYPE 'B' REQUIRED: ALL UNITS AT BUILDINGS A1, A2, B, C. NONE AT CARRIAGE HOUSES
	TYPE 'B' PROVIDED: ALL REMAINING UNITS AT ALL BUILDINGS O.K. NO UNITS REQUIRED TO BE ACCESSIBLE; NONE PROVIDED
FIRE BARRIERS IBC SEC.706.3.9 & 706.5:	GROUP U PORTION OF BLDG TYPE B3 & C1 IS DIVIDED INTO SEPARATE FIRE AREAS NOT TO EXCEED 1,000 SF

Other Significant Residential Provisions Changes

New Definitions

- Detached Single-Family Dwelling (202, HCD 1) Any single-family dwelling separated from property line by 3' or more or is separated from adjacent buildings by 6' or more
- Townhouse (202) = 3 or more attached dwelling units, not more than 3 stories, each with a separate exit, each with an open space on at least 2 sides, and each dwelling unit extends from foundation to roof

New Definitions (Continued)

- Grade or grade plane (502 HCD 1) = The lowest point of finished surface of ground, paving or sidewalk within the area between the building and the property line or 5' from the building. Critical in determining whether or not the building has a basement
- Fire Separation Distance (702.1) = Setback
 Distance

Townhouses - 419.4

- Each townhouse considered a separate building
- Separated by two one-hour walls or one two-hour wall continuous from foundation to underside of the roof sheathing deck or slab. For one two-hour wall:
 - No plumbing or mechanical equipment, ducts or vents allowed in cavity of common wall
 - Electrical installations per Calif. Electrical Code and CBC 712 (same as UBC)
- Requires compliance with parapet provisions
- Openings not permitted
- Penetrations need to meet fire ratings and firestop requirements similar to UBC - 419.4.3 Exc. & 712

Townhouses - Continued

Each Unit needs to be Structurally Independent (419.4.4)

- Exceptions:
 - Foundations supporting exterior or common walls
 - Structural roof and wall framing from each unit
 - Nonstructural wall coverings
 - Flashing
 - When Townhouses separated by common 2-hour wall per 419.4

Townhouse Parapets - 419.4.2

- Parapets constructed in accordance with 704.11.1 required for common Townhouse walls - similar to UBC - 30" above roof surfaces
 - Exceptions similar to UBC:
 - Min. Class C (Class B in OC) roofing over:
 - Noncombustible roof decking or sheathing, or
 - Approved fire-retardant-treated wood for 4' on each side of the wall or walls, or
 - One layer of 5/8" Type X gyp board directly beneath the roof decking or sheathing for 4' on each side of the wall or walls

Parapets and Exceptions -419.4.2



Garages and Carports -406.1.4

- No openings into rooms used for sleeping purposes
- Ducts minimum 26 gage sheet steel w/no openings
- 20 minute door, or
 - 1 3/8" solid wood core door, or
 - 1 3/8" solid or honeycomb core steel door
- Garages with habitable rooms above require 5/8" Type X gyp board on lid and 5/8" Type X gyp board on supporting walls (711.4)
- Separation between garage and the residence and its attic by 1/2 gyp board
- Garage door springs require HCD approved containment devices (1211.1.1)

Garage Separation - 406.1.4



Garage Separation - 406.1.4



Separation of R-3 & U - Table 602 footnote f & 416.1.3



Sprinkler Exceptions - 903.2.7

 Section 903.2.7 requires automatic sprinkler systems in all Group R buildings

- CBC Exceptions:
 - Detached 1- and 2-family dwellings and townhouses
 - Group U private garages accessory to a Group R-3 occupancy
 - Group R-3.1 under most circumstances

Smoke Alarms – 907.2.10.1.2 & 907.2.10.5

Similar to UBC

Interconnected, hard-wired with battery back-up

Located as follows:

- Each sleeping room
- Outside each separate sleeping area in immediate vicinity of bedroom
- On each story including any basement
- Alterations, repairs or additions trigger compliance when work >\$1,000
 - No Exception for: Work involving exterior surfaces (change from UBC)

Stairways - 1009.3.4

- Maximum Rise = 7-3/4" (8" in UBC)
- Minimum Run = 10" (9" in UBC)
- Minimum headroom = 6'8" above tread nosings
- Enclosed usable space under stairs requires 1/2" Gypsum Board on walls and soffits (1009.5.3 exc.)
- Minimum 36" wide with handrail(s) encroaching no more than 4.5" on either side
- Handrail (1009.10.2 & 1009.10.4) on one side -34" to 38" above tread nosings for four or more risers
- Maximum slope of ramps (1010.2) 1 in 12 or 8.33% with 3' by 3' landings at ends (1010)

Stair Treads and Risers -1009.3 Exc. 4



Stairway Landings – Exc. 1009.4.3



Guards - 1013.1

- Formerly called guardrails
- On platforms > 30" above grade Min. 42" high (was 36" in UBC) with railings so a 4" sphere cannot pass thru
- On stairways 34" to 38" above tread nosing with railing so a 4-3/8" sphere cannot pass thru
Guard Height - 1013.2 Exc. 1



Guard Height (Continued) -1013.2



Egress Through Intervening Rooms - 1014.2.2 Exc. 4 & 5

- Exception 4 (HCD 1) Means of egress may lead through other sleeping areas, toilet rooms or bathrooms in one and two family dwellings and townhouses
- Exception 5 (HCD 1) One- and two-family dwellings and townhouses may have means of egress pass through rooms and intervening spaces, except garages

Heating and Stairway Lighting

• Stairway illumination:

• All interior and exterior stairs require illumination of one foot-candle - (1205.4)

New requirement

• Heating:

- Heating to maintain min. 68 degrees at 3' above floor in habitable rooms - (1204.1) (UBC was 70 degrees)
- Exception: (HCD 1) Passive solar energy collector designed as a conditioned area per CEC Title 24, Part 6

Window Sills - 1405.12.2

- Where window sills are >72" above finished grade or surface below:
 - The lowest part of the clear opening of the window needs to be min. 24" above floor, and
 - Glazing between floor and a height of 24" needs to be fixed or with openings such that a 4" sphere cannot pass
 - Exception: Openings provided with window guards per ASTM F 2006 or F 2090

Window Sills - 1405.12.2



Newport Beach Non-Structural Building Code Amendments

High Rise Definition

- 40 feet
- 55 feet or higher shall comply with only the fire alarm and sprinklers requirements
- Fire Hazard Severity Zone construction standards
- Sprinkler system when required.
- Minimum roofing classification.
- Swimming pool barrier requirements.

Thank you for your attention!

ANY QUESTIONS?