

## Description

- Discusses critical concepts of the 2015 *International Existing Building Code*® (IEBC®).
- Provides a basis for the correct use and application of the code.
- Builds an understanding of the intent of the code through detailing:
  - Basic tables
  - Categorizations
  - A case study



## Goal

- To identify and describe key provisions of the 2015 IEBC.



## Objectives

- Upon completion, participants will be better able to:
  - Identify the three different compliance methods offered by the IEBC.
  - Recognize the classifications of work associated with existing buildings.
  - Identify fire protection systems that need to be upgraded.
  - Recognize vertical openings that need partial or complete enclosure.



## Objectives

- Upon completion, participants will be better able to:
  - Identify unsafe interior finishes that need to be replaced.
  - Determine adequate means of egress.
  - Identify needed accessibility improvements.
  - Identify improvements to structural systems.
  - Describe the compliance alternative tabular method of evaluating existing buildings.



2015 IEBC Overview

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## Overview

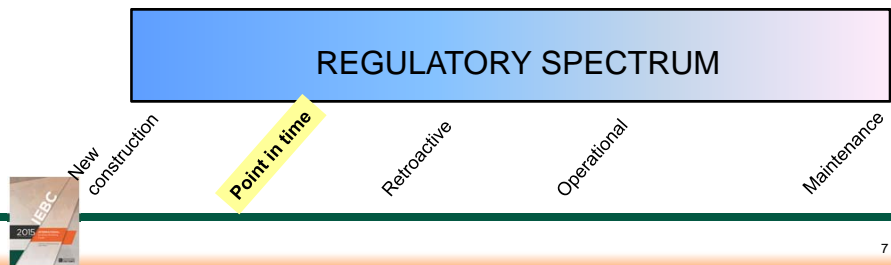
- Types of regulatory documents
  - ICC publishes several types of codes.
  - The code regulate at a variety of stages of a building from initial design and construction through long term use.



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# Overview

- Types of codes include the following
  - New construction
  - Point in time (Alteration, Addition, Repair, Change Of Occupancy)
  - Retroactive
  - Operational
  - Maintenance



# Overview

## Point in time application

- New construction (IBC)
- Point in time -repair, alt, add (IEBC)



## Always applicable

- Retroactive (IFC)
- Operational (IFC)
- Maintenance (IFC, IPMC)



## Overview

- IEBC has several methods
  - Prescriptive method
  - Work area method
  - Performance Method
- Section 301.1 requires the use of one method
- Exception if compliance with building code in existence at the time of original construction



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## Overview

- Topics regulated by IEBC
  - Structural
  - Means of egress
  - Fire protection
  - Accessibility
  - Electrical
  - Mechanical
  - Plumbing
  - Energy



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## Overview

- Prescriptive Method
  - Chapter 4
  - Originates from Chapter 34 of the IBC
  - Addresses
    - Repairs
    - Alterations
    - Additions
    - Change of Occupancy
    - Historic buildings



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## Overview

- Work area method
  - Chapters 5-13
  - Addresses
    - Repairs
    - Several levels of alterations (work area related)
      - Level 1 – removal and replacement of coverings
      - Level 2 – reconfiguration of space and addition or extension of systems
      - Level 3 – Work area greater than 50% of the building



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## Overview

- Work area method
  - Addresses (cont.)
    - Change of occupancy
    - Additions
    - Historic buildings
    - Relocated buildings



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## Overview

- Performance method
  - Chapter 14
  - Originates from Chapter 34 of the IBC
  - Scoring method of non structural lifesafety
  - Accessibility and structural issues must also be addressed



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## General Comments

- The 2015 IEBC is very similar in layout to 2012 IEBC. There has been no major renumbering.
- Chapter 34 of the IBC has been deleted. IBC references IEBC in Section 101.4.7 for
  - Repairs
  - Alterations
  - Changes of occupancy
  - Additions
  - Relocation of existing buildings



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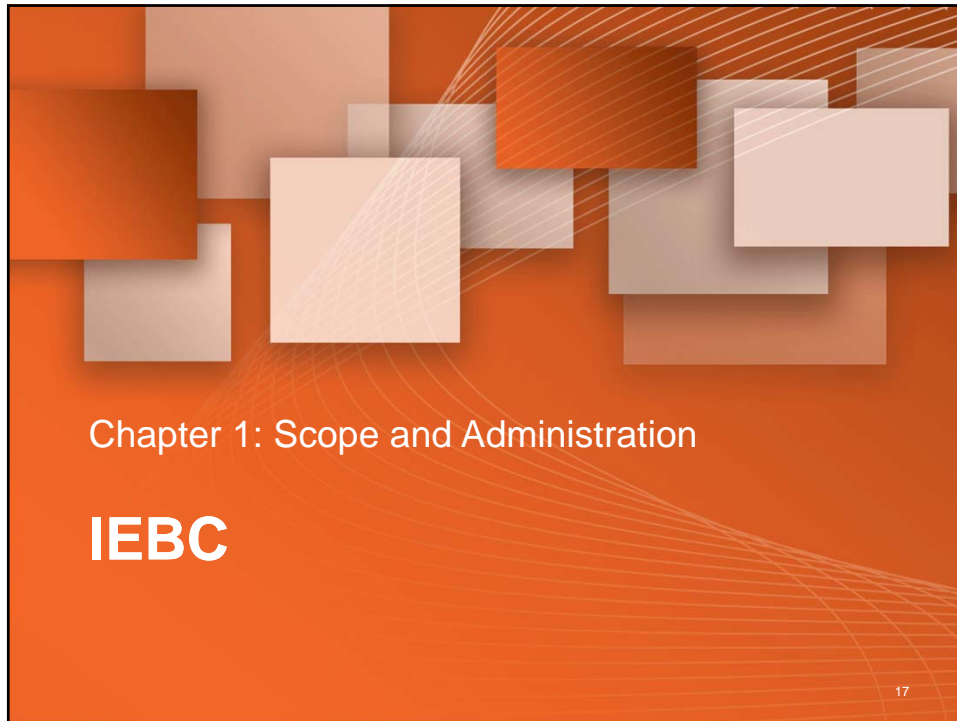
## Global Revisions

- Owner and owners authorized agent.
  - Verbiage made consistent throughout the I-Codes.
  - Revision is throughout Chapter 1 of the IEBC
- Flood hazard
  - IRC Section R322 now recognized along with the Section 1612 of the IBC throughout as applicable
    - **Prescriptive method** - 402.2, 403.2, 404.5, 408.3
    - **Work area method** - 601.3, 606.2.4, 701.3, 1103.5, 1201.4, 1302.6
    - **Performance Method** - 1401.3.3



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## Scope and Administration

- Alternative Methods and Materials

2015	2012
104.11	104.11

Feedback must be provided by code official as to why an alternate design, method or material was not approved.



Chapter 3: Provisions for All Compliance Methods


**IEBC**

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## Provisions for all Methods

- Seismic evaluation and design procedures

2015	2012
301.1.4	301.1.4



Revised to harmonize with new edition of ASCE 41. ASCE 41 now incorporates ASCE 31. Tables 301.1.4.1 and 301.1.4.2 were revised to be consistent with the terminology and structure of ASCE 41.



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## Provisions for all Methods

- General provisions

2015	2012
302	New

New section to address issues such as application of additional codes, existing and new material allowances and occupancy classification for all compliance methods. Language originates from Chapter 4 and 5.



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Chapter 4: Prescriptive Compliance Method

**IEBC**

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## Prescriptive Compliance Method

- Altered buildings in Seismic Design Category F

2015	2012
403.4.1/ 907.4.3	New

Evaluation and retrofit required in seismic design category F if work exceeds 50% of aggregate building area (level 3 alteration). Reduced seismic loads are permitted.



## Prescriptive Compliance Method

- Bracing for unreinforced masonry parapets upon reroofing

2015	2012
403.5	New

Section added into prescriptive method based upon Section 707.3.1 (Level 1 alteration). Essentially requires unreinforced masonry parapets to be braced where more the 25% of the roof is being replaced. This is applicable only to Seismic Design categories D, E and F



## Prescriptive Compliance Method

- Wall anchorage for unreinforced masonry walls in major alterations



2015	2012
403.6	New

Section added into prescriptive method based upon Section 907.4.5 and requires that unreinforced masonry walls be anchored where located in Seismic design category C, D, E and F. Note that Section 907.4.5 was revised to add seismic design category C.



## Prescriptive Compliance Method

- Bracing for unreinforced masonry parapets in major alterations



2015	2012
403.7	New

Section added into the prescriptive method based upon Section 907.4.6 for level 3 alterations. This requires that unreinforced masonry parapets be braced where located in seismic design categories C, D, E and F. Note that Section 907.4.6 was revised to add seismic design category C.



## Prescriptive Compliance Method

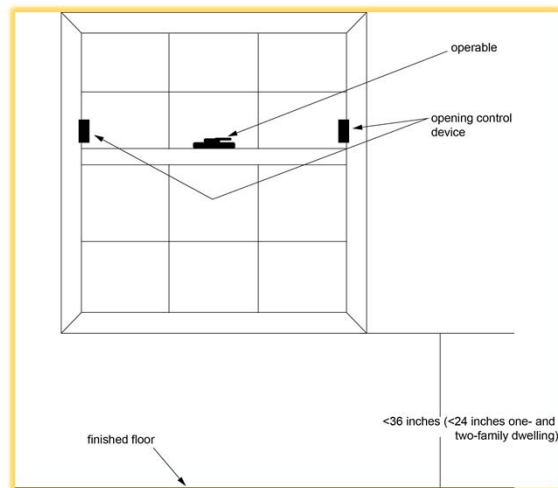
- Replacement window opening control devices/window opening control devices

2015	2012
406.2/702.4	New

Requires that when windows are replaced that window opening control devices be provided to protect children from falls. This has been addressed in the IBC for new construction but not for the replacement of existing windows.



## Example opening control devices



## Height from grade



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## Prescriptive Compliance Method

- Replacement window emergency escape and rescue openings

2015	2012
406.3/702.5	New

Requires that if a window is intended for emergency escape (Group R) compliance is not required with IBC under certain conditions: Largest window made that will fit with largest opening. Permitted to be same operating style



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## Prescriptive Compliance Method

- Change of Occupancy (structural)

2015	2012
407.4	407.4

Allows the use of the seismic design levels and techniques in Chapter 3 – essentially ASCE 41.



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## Prescriptive Compliance Method

- Historic buildings

2015	2012
408	408



Structural improvements unnecessary (relative to a predamage condition). Only lifesafety hazards addressed. Flood provisions now reference both IBC and IRC



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## Prescriptive Compliance Method

- Alterations affecting an area containing a primary function

2015	2012
410.7/705.2	410.7/705.2

Now requires that the accessible route to the primary function include both toilet facilities and drinking fountains. Previously, it allowed the choice of one or the other. The two are unrelated and this was inappropriate.



## Prescriptive Compliance Method

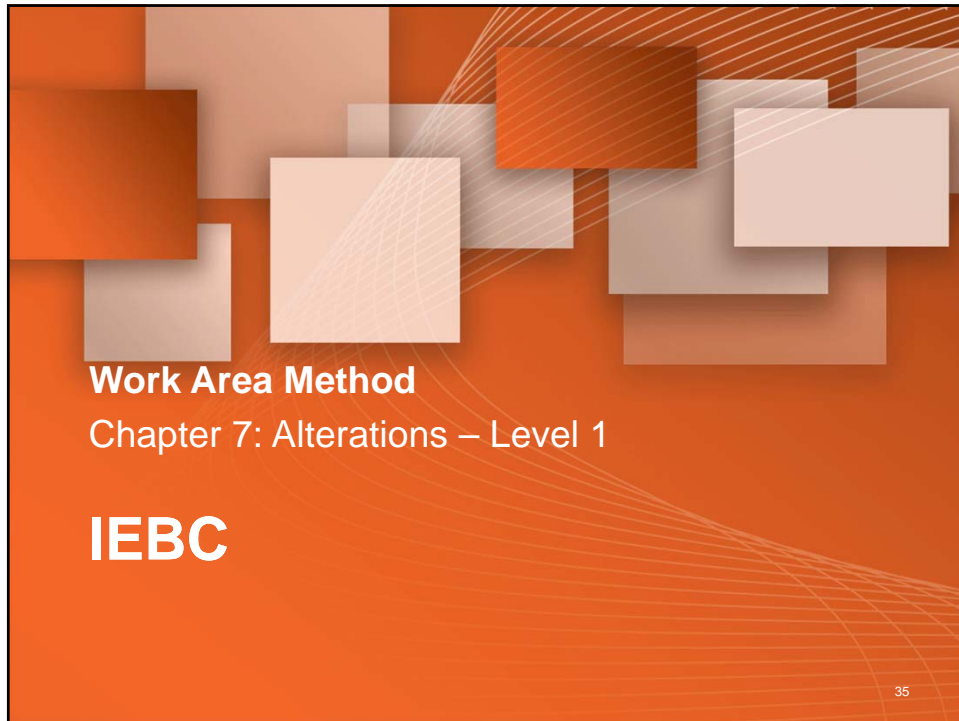
- Amusement rides and accessibility

2015	2012
410.8.14/705.1.14	New



- Altered amusement rides must comply with IBC 1110.4.8. The alterations are related to structural or operational characteristics that differ from that specified by the manufacturer or original design.





**Work Area Method**  
 Chapter 7: Alterations – Level 1

**IEBC**

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## Alterations – Level 1



- Replacement window opening control devices/window opening control devices

2015	2012
406.2/702.4	New

Same requirement as noted in Section 406.2 in the prescriptive method. Requires opening control devices for replacement windows.



## Alterations – Level 1

- Emergency escape and rescue allowance

2015	2012
406.3/702.5	New

Same language as Section 406.3. Provides flexibility for replacement windows where they are already emergency escape and rescue openings.



## Alterations – Level 1

- Alterations affecting an area containing a primary function

2015	2012
410.7/705.2	410.7/705.2



- Same change as Section 410.7. Must address both bathrooms and water fountains on the route to the primary function.



## Alterations – Level 1

- Amusement rides and accessibility



2015	2012
410.8.14/705.1.14	New

- Same as prescriptive method. Altered amusement rides must comply with IBC 1110.4.8



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## Alterations – Level 1

- Reroofing



2015	2012
706	New

Duplicated from Section 1510 of the IBC to address reroofing and the conditions and requirements associated with reroofing. This is typically an existing building issue so it was felt appropriate to also locate within the level 1 alteration requirements.



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**Work Area Method**  
 Chapter 8: Alterations – Level 2

**IEBC**

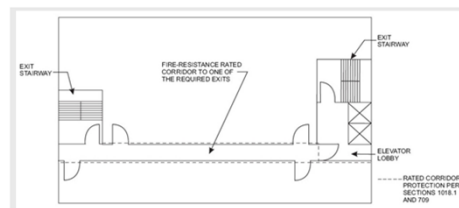
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## Alterations – Level 2

Figure 1018.6(2) CORRIDOR CONTINUITY

- Fire resistance reduction

2015	2012
803.6	New



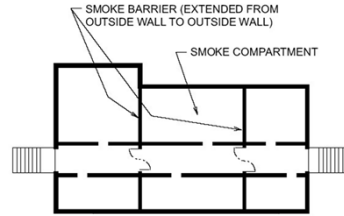
Where automatic sprinklers are installed reductions may be allowed in fire resistance rated construction. Must comply with IBC. Specific documentation is required.



## Alterations – Level 2

- Refuge areas Group I-2, I-3 and ambulatory care facilities

2015	2012
805.10	New



Capacity for refuge areas must not be reduced. These occupancies utilize smoke compartments and space must be maintained during movement of occupants/patients.



### Work Area Method

Chapter 9: Alterations – Level 3

# IEBC

## Alterations – Level 3

- Upholstered furniture and Mattresses



2015	2012
904.1.3	New

This new section requires an automatic sprinkler system where work areas include Group F-1 (over 2500 sq ft), M (over 5000 sq ft) and S (over 2500 sq. ft) occupancies that manufacture, display or store upholstered furniture, as applicable. This provision only applies to level 3 alterations. The requirement relates to the hazards that upholstered furniture pose and based upon losses such as those in Charleston, South Carolina.



### Work Area Method

Chapter 10: Change of Occupancy

# IEBC

## Change of Occupancy

- General (Change of occupancy requirements)

2015	2012
1001	1001

The general provisions of Chapter 10 were revised to more clearly explain change of occupancy classification and change of use. Also a new requirement was added in Section 1001 and throughout Chapter 10. If an IBC Chapter 9 threshold is exceeded that the provisions of Chapter 9 of the IBC would be applicable.



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## Change of occupancy

- Example:
  - Group A-2 restaurant is changing level of activity by becoming and A-2 nightclub. Occupant load increases 120 to 200.
  - Section 903.2.1.2 of the IBC requires and automatic sprinkler system in fires areas where one of the following applies
    - Fire area > 5000 square feet
    - Fire area has an occupant load of 100 or more
    - Fire area on a level other than the level of exit discharge.
  - Based upon the occupant load alone the building would be required to provide an automatic sprinkler system in the fire area where the Group A-2 is located.



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# Change of Occupancy

- Special use and occupancy  
 - Group I-2



2015	2012
1002.1	1002.1

Now requires that a building changing occupancy to I-2 must comply with the IBC. Note Ambulatory care facilities were added in the 2012 IEBC.



# Change of Occupancy

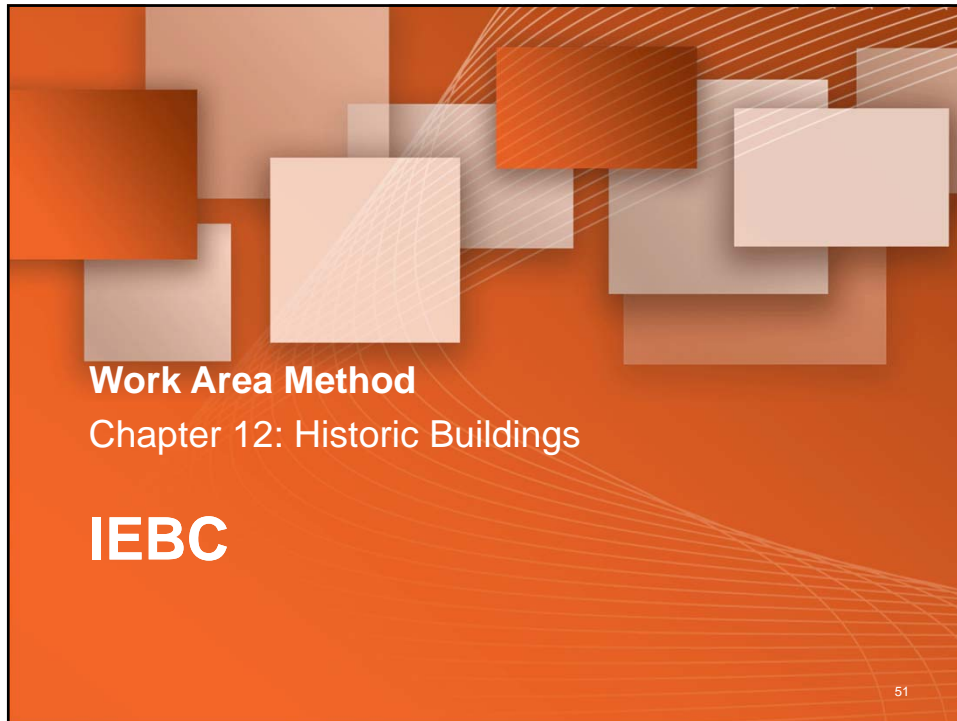
- High rise exception from  
 heights and area requirements

2015	2012
1012.5.1	1012.5.1



Exception provided for high rise buildings from the more restrictive height and area restrictions of the current IBC for buildings greater than 420 feet. This relieves the more restrictive column limitations. Must be previously permitted with older requirements.





**Work Area Method**  
 Chapter 12: Historic Buildings


**IEBC**

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## Historic Buildings


- Roof coverings (Change of occupancy)

2015	2012
1205.5	1205.5



Previously specific standards for roof coverings were not provided. Roof coverings now need to comply with

- ASTM E108
- UL 790



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# Historic Buildings

- Interior Finishes (Change of occupancy)

2015	2012
1205.9	1205.9

Previously specific standards for interior finishes were not provided. Interior finishes now need to comply with

- ASTM E84
- UL 723



## Work Area Method

Chapter 13: Relocated or Moved Buildings

# IEBC

# Relocated or Moved Buildings

- Relocatable buildings

2015	2012
1301.1	1301.1



Previously it was unclear if relocatable buildings would be regulated as relocated or moved buildings or as brand new buildings. This has been clarified and are recognized by this chapter.



Chapter 14: Performance Compliance  
Method

**IEBC**

## Performance Method

- Group I-2 added to evaluation

2015	2012
Chapter 14	Chapter 14

Allows the use of the performance evaluation method for Group I-2 occupancies. Includes new scores and requirements such as patient ratios and smoke compartmentation which contribute to the score.



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## Multi Use Building


- Case Study Background Information:
  - An existing three-story, multiple-tenant Group B building in Dublin, Ohio, is being converted into a multiple-use structure. The building is 7,500 square feet per floor (687 m<sup>2</sup>), constructed with masonry exterior walls and concrete floors supported on open web steel joists. Currently, the building does not have a sufficient water supply for a sprinkler system without the installation of a new fire pump.



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CASE STUDY




## Multi Use Building

- **Scope of Work**
  - Alterations need to be made to 100 percent of the ground floor; 60 percent of the second floor and 25 percent of the third floor. Additionally, there is a change of occupancy on the entire first floor from Group B to a restaurant (Group A-2).




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CASE STUDY



## Multi Use Building

- **Classification of Work**
  - What is the classification of work for this building?
- **Code Compliance Considerations—Alterations**
  - Building Elements and materials, Fire Protection, Means of Egress, Accessibility, Structural, Energy Conservation
- **Code Compliance Considerations—Change of Occupancy**
  - Building Elements and materials, Fire Protection, Means of Egress, Accessibility, Structural, Energy Conservation



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## Summary

- The layout of the IEBC has not changed dramatically from 2012 to 2015
- IEBC now main source for alteration, additions, repairs and change of occupancy
- Seismic requirements clarified and upgraded for masonry construction
- Window fall prevention devices added
- Various improvements to accessibility requirements
- Sprinkler requirements for upholstered furniture and mattresses



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