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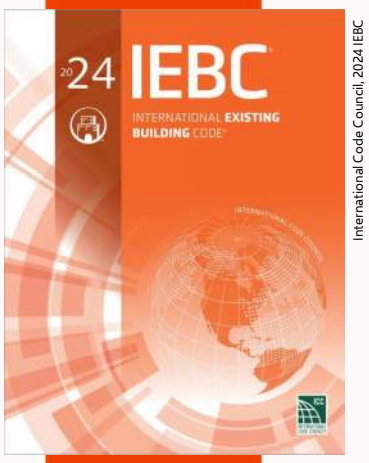
2024 IEBC

Overview & Update



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Learning Objectives

1. Understand the differences between the **five different** compliance methods outlined in the 2024 IEBC.
2. Identify the **triggers** that apply to repairs, alterations, additions and changes in occupancy.
3. Know what requirements apply to historic structures and moved buildings.
4. Highlight key changes made in the 2024 IEBC.

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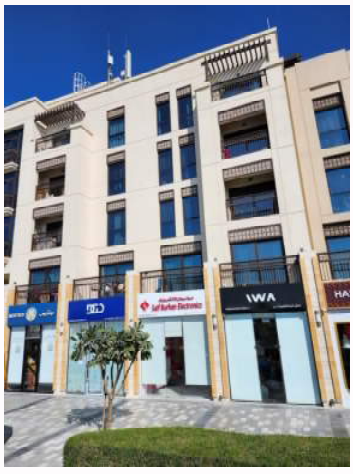
Seminar Format

1. Introduction
2. General Items
3. Repairs
4. Prescriptive Compliance
5. Work Area Compliance
6. Performance Compliance
7. Moved Buildings
8. Examples

BCS BUILDING CODE SOLUTIONS

Part 1. Introduction



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Warm Up

- What % of your permit applications involve existing buildings?
- What building code(s) address existing buildings?
- When is a seismic upgrade required?
- When does an accessible restroom need to be added?

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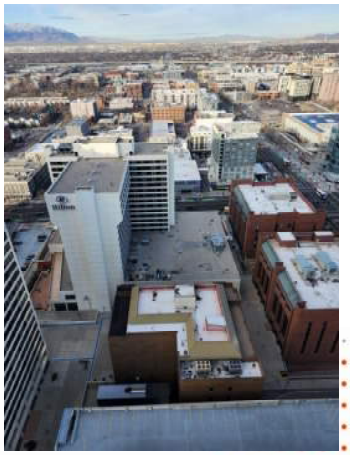
Statistics

- Roughly **5 Million** commercial buildings exist in the U.S.
- With a population of +/- 334M, there is one commercial building for every **67** people!
- Total new commercial buildings per year is between 15K - 30K
- So, for every new building, there are **167 – 333** existing buildings!



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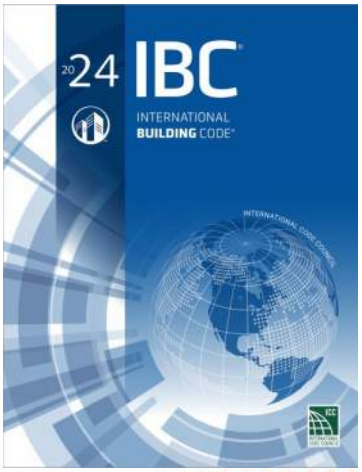
IBC Requirements

- **IBC 101.2:** *Scope*
  - Applies to "…the construction, alteration, relocation, enlargement, replacement, repair, equipment, use and occupancy, location, maintenance, removal and demolition of every building or structure…"



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IBC Requirements

- **IBC 101.4.7:** *Existing Buildings*
  - The IEBC is a referenced code. → What does that mean?
  - Shall apply to matters governing…
    - Repairs
    - Alterations
    - Changes of occupancy
    - Additions
    - Relocations

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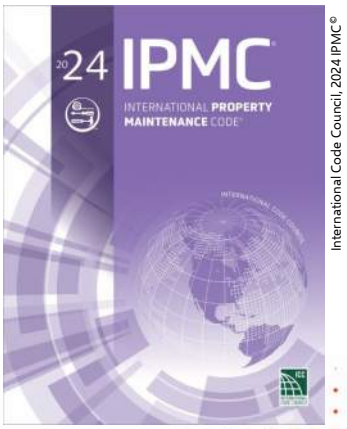
IBC Requirements

- **IBC 102.6:** *Existing Structures*
  - "The legal occupancy of any structure existing on the date of adoption of this code shall be permitted to continue without change, except as otherwise specifically provided in this code, the (IEBC), the (IPMC) or the (IFC)."



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IBC Requirements

- **IBC 102.6:** *Existing Structures*
  - Buildings previously occupied → Can continue without change
  - Buildings, or portions, not previously occupied → current IBC

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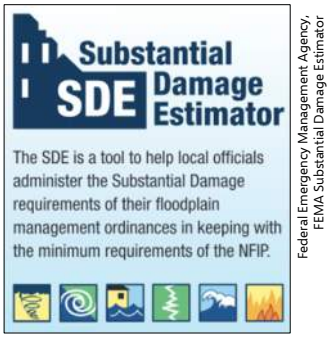
IBC Requirements

- **IBC 104.3.1:** *Substantial Determination*
  - Is work located in a Flood Hazard Area?
  - Does work constitute "Substantial damage" or a "substantial improvement"?
  - Shall comply with IBC or IRC.



Substantial - 50% Rule

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IBC Requirements

- **IBC 116:** *Unsafe Structures and Equipment*
  - Structures or existing equipment that are, or become…
  - Unsafe, insanitary or deficient because or…
  - Inadequate means of egress, lighting & ventilation, or…
  - Constitutes a fire hazard, or…
  - Is otherwise dangerous to human life or public welfare…
  - **Shall be taken down, removed or made safe.**

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IBC Requirements

- **IBC 3113:** *Relocatable Buildings*
  - A new relocatable shall comply with this code.
  - An existing relocatable that is undergoing alteration, addition, change of occupancy, or **relocation** shall comply with Chapter 14 of the IEBC.
  - The B.O. is authorized to accept inspection reports from approved agencies to satisfy IBC 110.3-110.3.12.1 for off-site construction.

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IBC Requirements

- **IBC 3113:** *Relocatable Buildings*
  - Provides specific requirements for what is to be included on the MFR's data plate.
  - **Supplemental information:**
    - Mfr's name & address
    - Date of manufacture
    - Serial number
    - MFR Design drawings
    - Type of construction
    - Design loads
    - Building planning & structural design data
    - Mfr data plate

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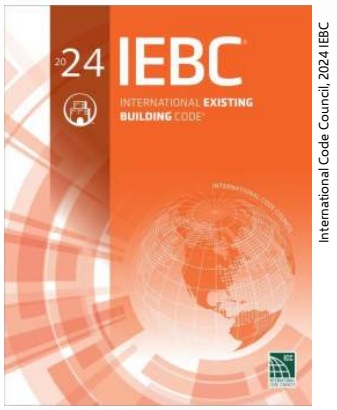
IEBC Purpose

- **IEBC 101.3:** *Purpose*
  - To "...provide ***flexibility*** to permit the use of alternative approaches to achieve compliance with minimum requirements to provide a ***reasonable*** level of safety, health, property protection and general welfare..."



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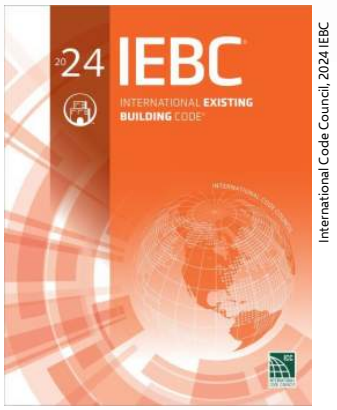
2024 IEBC

- Yes, it is another code book... but it is **only 100 pages**!
- Provides much more flexibility to the owner, builder and designer!
- Allows more opportunities for the design professional and building official to assist in helping more existing buildings to be safe.



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Preface

- **Introduction to the IEBC:**
  - "...it is necessary to regulate construction in existing buildings that undergo additions, alterations, extensive repairs or change of occupancy. **Such activity represents an opportunity** to ensure that new construction complies with the current building codes and that existing conditions are maintained, at a minimum, to their current level of compliance or are improved as required to meet basic safety levels."

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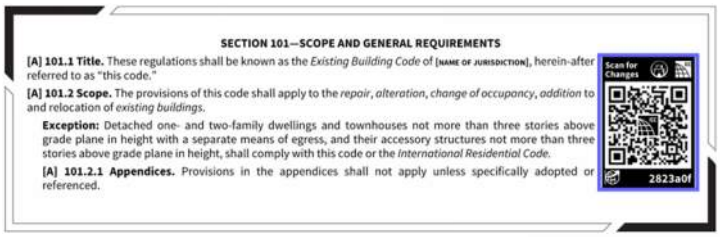
Preface

- Technical changes from the previous edition are represented by a QR code at the beginning of each section.
- Table showing where relocations occur.



SECTION 101—SCOPE AND GENERAL REQUIREMENTS

[A] 101.1 Title. These regulations shall be known as the *Existing Building Code* of [NAME OF JURISDICTION], herein-after referred to as "this code."

[A] 101.2 Scope. The provisions of this code shall apply to the *repair*, *alteration*, *change of occupancy*, *addition* to and relocation of *existing buildings*.

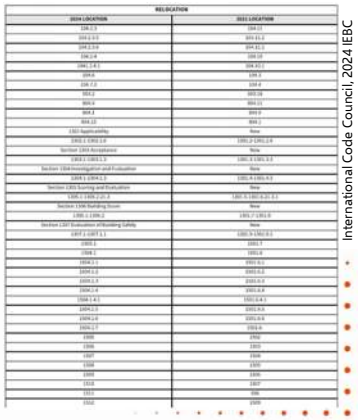
Exception: Detached one- and two-family dwellings and townhouses not more than three stories above grade plane in height with a separate means of egress, and their accessory structures not more than three stories above grade plane in height, shall comply with this code or the *International Residential Code*.

[A] 101.2.1 Appendices. Provisions in the appendices shall not apply unless specifically adopted or referenced.

Scan for Changes

2823a0f

International Code Council, 2024 IEBC



International Code Council, 2024 IEBC

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Gray Area

- Google Dictionary: *"An ill-defined situation or field not readily conforming to a category or to an existing set of rules."*
- Most of the I-codes are pretty black-and-white. That is not the case with the IEBC.
- There are many instances where enforcement is up to the discretion of the code official.

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IEBC Requirements

Often more than one occurs within the same project!

- Compliance paths…

Additions, Alterations & Changes of Occupancy

- Repairs → **Chapter 4**
- Prescriptive Compliance → **Chapter 5**
- Work Area Compliance → **Chapters 6-12**
- Performance Compliance → **Chapter 13**
- Relocated or Moved → **Chapter 14**

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Part 2. General Items

Applies to all

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Chapter 1

- **IEBC 101.2:** *Scope*
  - "...shall apply to the repair, alteration, change of occupancy, addition to and relocation of existing buildings."
  - *Exceptions* **(IEBC or IRC)**:
    - One- and two-family dwellings
    - Townhouses
    - Accessory structures

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Chapter 1

- **IEBC 101.3:** *Intent*
  - "...To provide flexibility to permit the use of **alternative approaches** to achieve compliance with minimum requirements to provide a **reasonable** level of safety, health, property protection and general welfare..."

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Chapter 1

- **IEBC 104:** *Duties & Powers of Code Official*
- Provisions extensively expanded to include:
  - **104.2.1- Listed Compliance**
  - **104.2.2- Technical assistance** (when deemed necessary by the B.O., at no cost to the jurisdiction, by someone qualified, with documented report and testing)
  - **104.2.3- Alternatives** (subject to B.O. approval, must respond in writing, meet the intent of the code, 6 element equivalency criteria list, testing and detailed reporting required, peer review can be requested)

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Chapter 1

- **IEBC 104.2.3.6:** *Reports*
  - **Evaluation Reports:** Shall be prepared by an approved agency. Criteria used for the evaluation shall be identified within the report.
  - **Other Reports:** Prepared by a qualified engineer, specialist, laboratory or fire safety organization acceptable to the B.O. The B.O. can require such report to be sealed.

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Chapter 1

- **IEBC 104.3.2:** *Preliminary Meetings*
  - When requested by permit applicant ***or*** B.O.
  - Purpose → Establish the specific applicability of IEBC
  - Does not apply to repairs or Level 1 alterations

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Chapter 1

- **IEBC 104.3.3:** *Building Evaluation*
  - "The code official is authorized to require an existing building to be ***investigated and evaluated*** by a registered design professional based on the circumstances agreed on at the preliminary meeting."
  - "The design professional shall notify the code official if ***any potential noncompliance*** with the provisions of this code is identified."

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Chapter 1

- **IEBC 106:** *Construction Documents*
  - Notice the difference from the IBC…
  - **IBC:** "Submittal documents consisting of construction documents, statement of special inspections, geotechnical report and other data…"
  - **IEBC:** "Submittal documents consisting of construction documents, special inspection and structural observation programs, investigation and evaluation reports, and other data…"

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Chapter 1

- **IEBC 106.3.3:** *Phased Approval*
  - "The code official is authorized to issue a permit for the construction of foundations or any other part of a building before the construction documents for the whole building or structure have been submitted, provided that adequate information and detailed statements have been filed…"
  - "The holder of such permit… shall proceed **at the holder's own risk**…"

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Incremental Approach

- Initial cost is typically the biggest hindrance to seismic rehabilitation
- FEMA recommends phased rehabilitation at discrete stages
- **FEMA Incremental Series:**
  - FEMA 395 – School Buildings (K-12)
  - FEMA 396 – Hospital Buildings
  - FEMA 397 – Office Buildings
  - FEMA 398 – Multi-Family Apartment Buildings
  - FEMA 399 – Retail Buildings
  - FEMA 400 – Hotel & Motel Buildings
  - FEMA 420 – Engineering Guideline

Federal Emergency Management Agency, FEMA 420 ©

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Chapter 1

- **IEBC 109.2:** *Preliminary Inspection*
- Plans do not always adequately depict existing conditions
  - "Before issuing a *permit,* the *building official* is authorized to examine or cause to be examined *buildings* and *sites* for which an application has been filed.

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Chapter 1

- **IEBC 109.3:** *Required Inspections*
  - **Special Inspections** (IEBC 109.3.9):
    - "Special inspections shall be required in accordance with the (IBC)."
    - Shall be qualified and approved (IEBC 109.4)
  - **IBC Requirements:**
    - Anything new as required by IBC Chapter 17
    - Many items fall under "special cases" (IBC 1705.1.1)
    - Statement of Special Inspections (IBC 1704.3.1)

Simpson Strong-Tie, CSS V-Wrap™ C200HM High-Modulus Code-Listed Unidirectional Carbon Fabric

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Chapter 1

- **IEBC 115:** *Unsafe*
  - Unsafe structures or equipment shall be taken down and removed or made safe if required by B.O.
    - Insanitary
    - Inadequate means of egress
    - Inadequate light & ventilation
    - Constitute a fire hazard
    - Dangerous to human life or public welfare
    - Illegal or improper occupancy
    - Inadequate maintenance
    - Unsecured vacant structures

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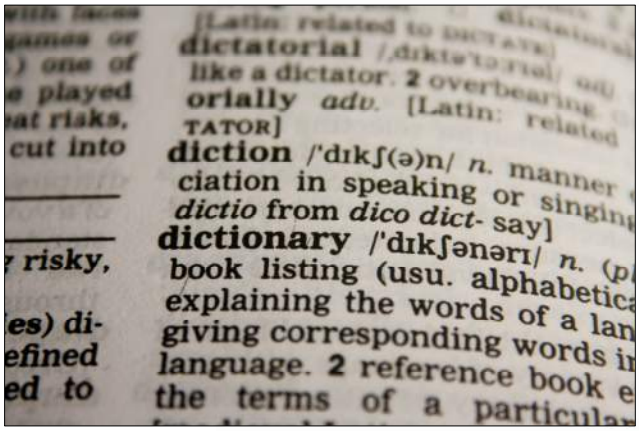
Chapter 2


dictatorial like a dictator. 2 overbearing orially adv. [Latin: related TATOR]
diction /'dɪkʃ(ə)n/ n. manner ciation in speaking or singing dictio from dico dict- say]
dictionary /'dɪkʃənərɪ/ n. (pl book listing (usu. alphabetica explaining the words of a lan giving corresponding words in language. 2 reference book e the terms of a particular
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Microsoft 365, PowerPoint, Stock Images

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Chapter 2

- **Relocatable Building:** A partially or completely assembled building constructed and designed to be reused multiple times and transported to different building sites.
- **Reroofing:** Recovering or replacing an existing roof covering.
  - **Roof Recover:** Installing an additional roof covering without removing existing roof covering.
  - **Roof Replacement:** Removing existing roof covering, repairing any damaged substrate, and installing new roof covering.

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Chapter 2

- **Change of Occupancy:** Any of the following where the IBC requires a greater degree of safety, accessibility, structural strength, fire protection, means of egress, ventilation or sanitation than is currently present:
  1. Change in occupancy classification.
     → **Warehouse to Church** *(Group S to Group A)*
  2. Change in the purpose of or level of activity.
     → **New Storage Tenant** *(Group S-2 to Group S-1)*
  3. Change of use.

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Chapter 2

- **Change of Use:** A change in the use of a building or a portion of a building, within the same group classification, for which there is a change in application of the code requirements.

EXAMPLE
Existing = Office Building (Group B)
Proposed = Ambulatory Care Facility (Group B)
Reason: IBC 422 has special provisions

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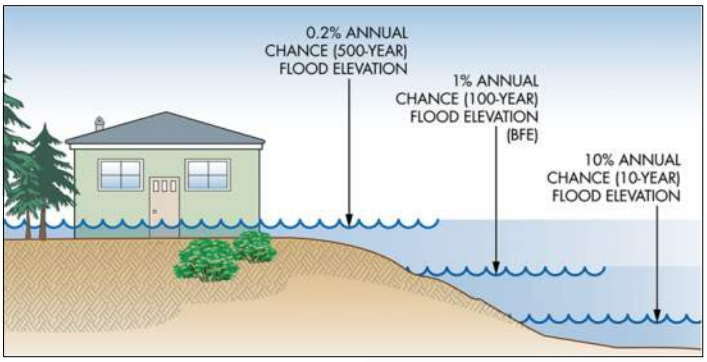
Chapter 2

- **Flood Hazard Area:** An area subject to flooding during the 100-year storm event.



Association of State Floodplain Managers, https://floodsciencecenter.org/

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Amendment

Chapter 2

- **Substantial Damage:** Cost of restoring structure to before-flood-damaged state would ***exceed 50%*** of market value before damage.

U.S. National Archives; Jamestown, Colorado 2013

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Amendment

Chapter 2

- **Substantial Improvement:** When the cost of repair, alteration, addition, or improvement ***exceed 50%*** of market value before the improvement or repair was made.
  - Exception #1: Improvement was required by code official due to unsafe or dangerous condition.
  - Exception #2: If it involves a historic structure and would preclude the structure's continued designation as a historic structure.

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Chapter 2

- **Substantial Structural Alteration:** Alterations to existing structural elements that combine to support more than ***30 percent*** of the floor or roof area. (Within 5-year period)

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Chapter 2

- **Substantial Structural Damage:** Where any the following apply:
  - Vertical elements have been damaged such that the lateral-load-carrying capacity of any story has been reduced by > 33%.
  - Any vertical component supporting 30% of the gravity loads for a floor/roof has been reduced by > 20%.
  - Any component carrying snow loads that support 30% of a roof area has been reduced by > 20%. Must be checked to meet 75% of IBC.

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Chapter 2

- **Historic Building:**
  - Any building or structure that is one of more of the following…
    - Listed or certified as eligible for listing by the National Register of Historic Places, or…
    - Designated as historic under state or local law, or…
    - Contributing resource on national register, state designated or locally designated historic district.

Wikimedia Commons, McMenamins Wilsonville Old Church & Pub

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Chapter 2

- **Work Area:** That portion or portions of a building consisting of all reconfigured spaces as indicated on the construction documents. Work area ***excludes*** other portions of the building where ***incidental work*** entailed by the intended work must be performed and portions of the building where work not initially intended by the owner is specifically required by this code.

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Chapter 2

- **Primary Function:** A primary function is a major activity for which the facility is intended. Areas that contain a primary function include, but are not limited to, the customer services lobby of a bank, the dining area of a cafeteria, the meeting rooms in a conference center, as well as offices and other work areas in which the activities of the public accommodation or other private entity using the facility are carried out.
- Mechanical rooms, boiler rooms, supply storage rooms, employee lounges or locker rooms, janitorial closets, entrances, corridors and restrooms are not areas containing a primary function.

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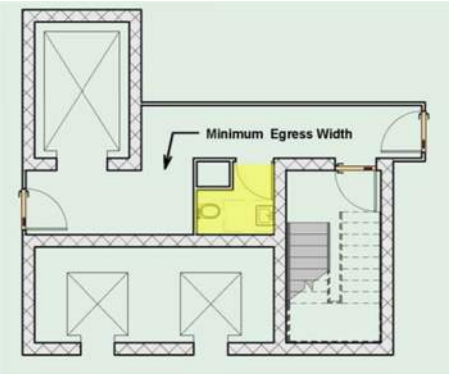
Chapter 2

- **Technically Infeasible:** An alteration that has little likelihood of being accomplished because the existing structural conditions require the removal or alteration of a load-bearing member that is an essential part of the structural frame, or because other existing physical or site constraints prohibit modification.



U.S. Access Board, https://www.access-board.gov/

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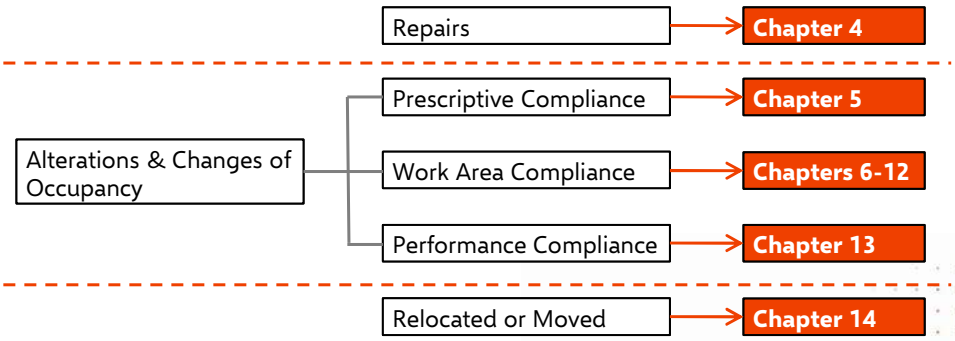
Chapter 3

- **Applies to all compliance methods!**



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Chapter 3

- **IEBC 301.3:** *Alteration, Addition, or Change of Occupancy*
  - Compliance paths "…shall not be applied in combination…"
  - **Prescriptive Compliance:** Per IEBC Chapter 5 and compliant with the IFC. *(This is a huge distinction!)*
  - **Work Area Compliance:** Per IEBC Chapters 6 thru 12.
  - **Performance Compliance:** Per IEBC Chapter 13 and the IBC structural requirements.

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PRESCRIPTIVE COMPLIANCE METHOD

Alterations (IEBC Section 503)

Section	Description
503.1	Shall not make the building any less conforming
503.2	Flood hazard areas
503.3	Gravity rule
503.4	Lateral rule
503.5	SDC F - Full wind & reduced seismic + nonstructural
503.6	URM parapet bracing at reroof
503.7	Roof-to-wall anchorage (concrete & masonry walls)
503.8	Floor - & Roof-to-wall anchorage (URM walls)
503.9	URM parapet bracing , alteration > 50%
503.10	Anchorage or URM partitions
503.11	Substantial structural alteration
503.12	Roof diaphragms in high-wind (reroof)
503.13	Voluntary LFRS alterations
503.14	Smoke compartments in Group I-2 w/ > 30 care recipients
503.15	Cannot reduce required refuge areas
503.16	Smoke barriers in Group I-1, Condition 2 when > 30 care recipients
503.17	Ambulatory care (smoke compartments > 10,000ft^2 & separation)
503.18	Enhanced classroom acoustics
503.19	Locking arrangements in Group E
503.2	Two-way communication (>50% & elevtors provided)
504.1	Fire escapes allowed if ≤ 50% of required exits
505.1	Window replacements per IBC
505.2	Opening control or fall protection shall be provided for Groups R-2 & R-3
505.3	EERO shall be met (exceptions for existing)

This is a rough breakdown of what is required for ***Alterations*** when following the **Prescriptive Method.**

WORK AREA COMPLIANCE METHOD

Alterations (IEBC Chapters 7, 8 & 9)

Level	Description
1	Shall not make the building any less conforming
	Flood hazard areas
	New floor, ceiling, wall and trim finishes per IBC Chapter 8
	Opening control or fall protection shall be provided (replaced - Groups R-2 & R-3)
	EERO shall be met, unless existing (limitations)
	Alterations shall maintain level of fire protection
	Alterations shall maintain level of protection from means of egress
	Locking arrangements in Group E
	Reroofing materials and methods per IBC Chapter 15
	Roof recover limitations
	Structural - only applies if reroofing or replacing equipment
	Gravity rule or 2nd layer ≤ 3psf
	URM parapet bracing at reroof
	Roof diaphragms in high-wind (reroof)
	Health care facilities --> altered electrical system must comply with NFPA 99
	Alteration itself shall comply with IECC

Now compare this to **Alteration** requirements when following the ***Work Area Method.***

2	Must also comply with Level 1 alterations
	Work area requirements do not apply to MEP systems, windows & hardware, or accessibility improvements
	Existing vertical openings (2+ floors) shall be 1-hour enclosed - Several exceptions
	If > 50% shaft enclosure requirements must be met
	If > 50% stairway enclosure shall also be smoketight
	Smoke compartments in Group I-2 w/ > 30 care recipients
	Interior finish in exits & corridors per IBC (entire floor if > 50%)
	Guards shall be provided (existing can remain and not comply)
	Sprinklers shall be provided in numerous occupancies if required by IBC (numerous conditions)
	Standpipes required if serving > one tenant and floor > 50 feet above grade
	Fire alarm in Group E, I-1, I-2, I-3, R-1 & R-2 per IFC Chapter 11
	Means of egress provisions only apply to > one tenant
	Group I-2 where corridors are used to move occupants in beds - min. width of 48"
	Cannot reduce required refuge areas
	Single exit allowance slightly reduced from IBC
	Fire escapes can be provided where more than one exit is needed
	Mezzanine exiting same as IBC
	Group A > 300 occupants - Main entrance shall accommodate 50%
	> 50 occupants requires door swing in direction of egress travel
	Doors opening into exit stairway or exit passageway shall be self- or automatic-closing (if > 50% of floor shall extend to level of exit discharge)
	Doors serving Group A > 100 occupants shall have panic hardware
	Power-operated doors in Group I-3 shall have emergency power
	Limitation on openings in corridors including doors, transoms, etc.
	Dead-end corridors limited to 35-feet (30-feet in Group I-2)
	Means of egress lighting per IBC (if > 50% shall be entire floor)
	Exit signs per IBC (if > 50% shall be entire floor)
	Limitation on stairways (pitch or slope)
	Escalators serving below-grade transportion can have width < 32-inches
	Handrail provisions - existing nonconforming not required to be replaced
	Guards from work area floor to the level of exit discharge
	Gravity rule
	Lateral rule
	Voluntary LFRS alterations
	New installations per NEC
	Existing wiring in Groups A-1, A-2, A-3, H and I shall be upgraded to meet material and methods.
	Health care facilities --> altered electrical system must comply with NFPA 99
	Groups R-2, R-3, R-4 & IRC - minimum requirements for electrical outlets and lighting within work area
	Reconfigured spaces shall have natural or mechanical ventilation per IMC
	Altered or extended systems shall provide min. 5cfm per person of outdoor air and 15cfm per person of ventilation
	Local exhaust required for newly introduced devices that can adversely impact occupants
	Health care facilities --> added portion of existing med gas system must comply with NFPA 99
	Alteration itself shall comply with IECC

3	Must also comply with Level 1 and 2 alterations
	High-rise - If recirculating air or exhaust > 15,000cfm - smoke/heat detection is required within systems
	High-rise: At least one elevator shall have emergency operation per ASME A17.3 (All new shall have Phase I and Phase II)
	Smoke barriers in Group I-1, Condition 2 when > 30 care recipients
	Ambulatory care (smoke compartments > 10,000ft^2 & separation)
	Boiler/Furnace rooms 1-hour separation from Groups I-1, I-2, I-4, R-1, R-2 & R-4
	Shafts and vertical openings shall be protected per Chapter 8 down to level of exit discharge & floors below
	Work areas in Group R-3 shall ensure continuity of walls separating dwelling units
	Interior finish in exits serving work area shall comply with 802.4 down to level of exit discharge
	Enhanced classroom acoustics
	Additional sprinkler requirements in high-rise, wastebasket chutes, and much more!
	Fire alarm systems as required by IBC (throughout work area only)
	Means of egress lighting from highest work area floor to level of exit discharge
	Exit signs from highest work area floor to level of exit discharge
	If elevators - two-way communication as required by IBC
	Substantial structural alteration - full IBC wind, reduces seismic + nonstructural components
	SDC F - Full wind & reduced seismic + nonstructural
	Roof-to-wall anchorage (concrete & masonry walls)
	Floor - & Roof-to-wall anchorage (URM walls) - floor is not listed but that was the intent
	URM parapet bracing , alteration > 50%
	Anchorage or URM partitions
	Alteration itself shall comply with IECC
	Emergency responder communication enhancement system (ERCES) required throughout building

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Chapter 3

- Did you notice a difference between the requirements for the two methods?
- **IBC 301.3.1:** *Prescriptive Compliance Method*
  - Shall comply with Chapter 5 ***and*** the IFC.
  - This second part is the key!
  - Many of the additional provisions of the Work Area Method are identical or similar to what would be required in the IFC.

BCS

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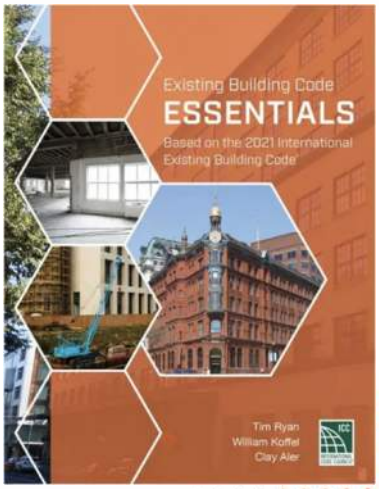
Chapter 3

- Chapter 4 highlights the following:
  - Is it a relatively new building?
    → **Prescriptive**
  - Is the proposed work limited to specific areas?
    → **Work Area**
  - Are there significant areas that do not comply with current code requirements?
    → **Performance**



BCS

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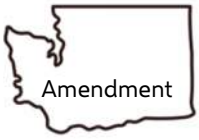

Chapter 3

- **IEBC 302:** *General Items*
  - All dangerous and unsafe conditions must be addressed.
  - Additional Codes: **WSEC**, IFC, IFGC, IMC, **UPC**, IRC, NFPA 99
  - Materials already in use may remain, unless determined by B.O. to be unsafe.
  - New structural members and connections per IBC
  - Occupancy determination per IBC Chapter 3

BCS

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Chapter 3

- **IEBC 304:** *Structural Evaluations*
  - The three triggers are…
  - **IEBC 304.1** → Live loads
  - **IEBC 304.2** → Snow loads
  - **IEBC 304.3** → Seismic

Microsoft 365, PowerPoint, Stock Images

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55

Chapter 3

- **IEBC 304.1:** *Live Loads*
  - For alterations and additions…
    - Unchanged Live Loads → If evaluation is required, can be checked for live loads approved prior to construction.
    - Increased Live Load → Must comply with Section 1607 of the IBC, or…
    - A lesser live load can be approved by code official but non-conforming live loads must be placarded.

BCS

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Chapter 3

- **IEBC 304.2:** *Snow Loads*
  - If new snow loads are created on adjacent buildings, they shall be evaluated to comply with ASCE 7

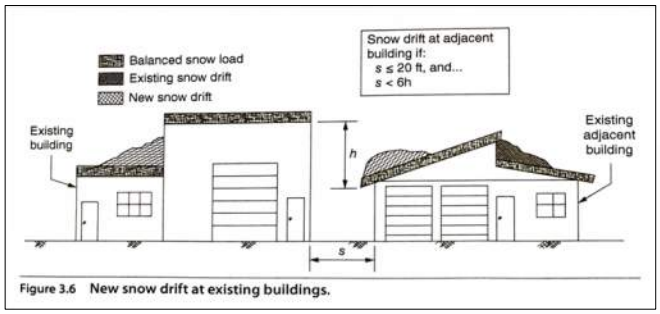

Figure 3.6 New snow drift at existing buildings.

McGraw Hill, 2018 IEBC Handbook ©

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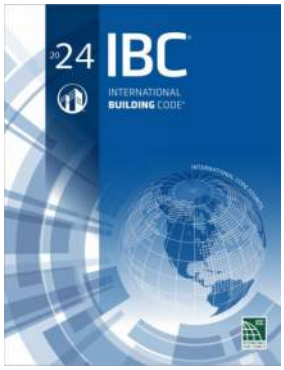
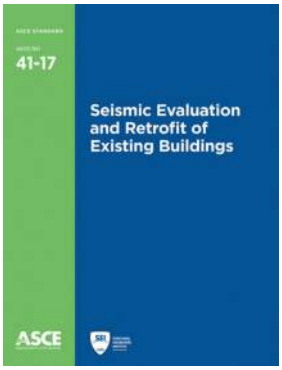
Chapter 3

- **IEBC 304.3:** *Seismic Evaluation & Design*
  - Based on IBC or ASCE 41-17



International Code Council, 2024 IBC©



American Society of Civil Engineers, ASCE 41-17 ©

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100%

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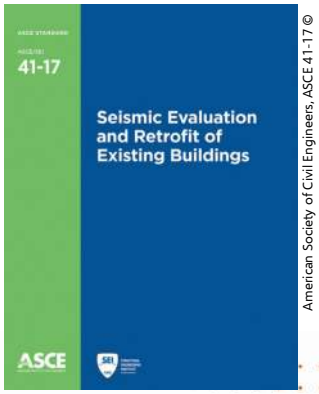
Chapter 3

- **IEBC 304.3.1:** *Full Seismic*
  - 100% IBC seismic forces (IBC 1613), or…
  - ASCE 41-17 (Tier 3 and two-level performance objective)
  - Shall not be applied in combination.



American Society of Civil Engineers, ASCE 41-17 ©

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100% 59

Chapter 3

- **IEBC 304.3.1:** *Full Seismic*
  - ASCE 41, ***Tier 3*** and the ***2-level performance objective***
  - ASCE 41 allows the designer and owner to work together to select the performance objective, however Table 304.3.1 must be met.

[BS] TABLE 304.3.1—PERFORMANCE OBJECTIVES FOR USE IN ASCE 41 FOR COMPLIANCE WITH FULL SEISMIC CRITERIA		
RISK CATEGORY (Based on IBC Table 1604.5)	STRUCTURAL PERFORMANCE LEVEL FOR USE WITH BSE-1N EARTHQUAKE HAZARD LEVEL	STRUCTURAL PERFORMANCE LEVEL FOR USE WITH BSE-2N EARTHQUAKE HAZARD LEVEL
I	Life Safety (S-3)	Collapse Prevention (S-5)
II	Life Safety (S-3)	Collapse Prevention (S-5)
III	Damage Control (S-2)	Limited Safety (S-4)
IV	Immediate Occupancy (S-1)	Life Safety (S-3)

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100% 60

Chapter 3

- **IEBC 304.3.1:** *Full Seismic*

[BS] TABLE 304.3.1—PERFORMANCE OBJECTIVES FOR USE IN ASCE 41 FOR COMPLIANCE WITH FULL SEISMIC CRITERIA		
RISK CATEGORY (Based on IBC Table 1604.5)	STRUCTURAL PERFORMANCE LEVEL FOR USE WITH BSE-1N EARTHQUAKE HAZARD LEVEL	STRUCTURAL PERFORMANCE LEVEL FOR USE WITH BSE-2N EARTHQUAKE HAZARD LEVEL
I	Life Safety (S-3)	Collapse Prevention (S-5)
II	Life Safety (S-3)	Collapse Prevention (S-5)
III	Damage Control (S-2)	Limited Safety (S-4)
IV	Immediate Occupancy (S-1)	Life Safety (S-3)

- BSE-1N (Design Level Earthquake – 475 years)
- BSE-2N (Maximum Considered Earthquake – 2,475 years)
- Performance Objectives: S-1, S-2, S-3, S-4, S-5

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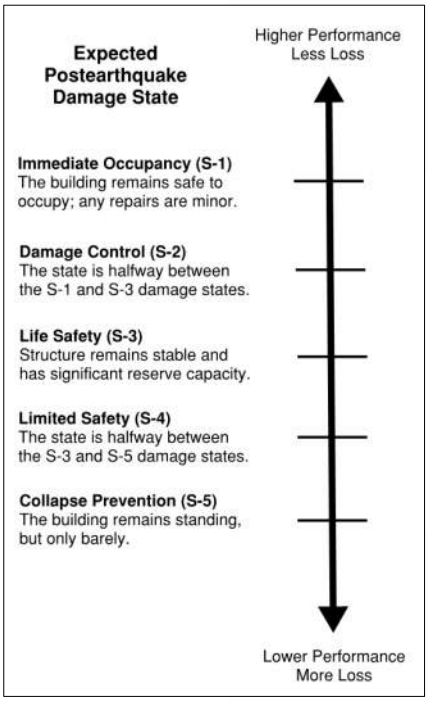

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100%

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Chapter 3

- **IEBC 304.3.1:** *Full Seismic*

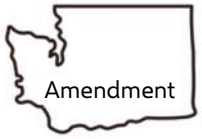
Sample Comment: A Warehouse to a Church
The project in question is classified as Risk Category III per IBC Table 1604.5. Please confirm that the analysis performed ensures compliance with the "Damage Control" performance level for the BSE-1N hazard and the "Limited Safety" performance level for the BSE-2N hazard as required by IEBC Table 304.3.1.

[BS] TABLE 304.3.1—PERFORMANCE OBJECTIVES FOR USE IN ASCE 41 FOR COMPLIANCE WITH FULL SEISMIC CRITERIA

RISK CATEGORY (Based on IBC Table 1604.5)	STRUCTURAL PERFORMANCE LEVEL FOR USE WITH BSE-1N EARTHQUAKE HAZARD LEVEL	STRUCTURAL PERFORMANCE LEVEL FOR USE WITH BSE-2N EARTHQUAKE HAZARD LEVEL
I	Life Safety (S-3)	Collapse Prevention (S-5)
II	Life Safety (S-3)	Collapse Prevention (S-5)
III	Damage Control (S-2)	Limited Safety (S-4)
IV	Immediate Occupancy (S-1)	Life Safety (S-3)

BCS

75% 63



Chapter 3

- **IEBC 304.3.2:** *Reduced Seismic*
  - **75%** IBC seismic forces, or…
  - ASCE 41, Table 304.3.2, or…
  - Appendices A1-A4. **(Adopted per IEBC 101.6 amendment)**

[BS] TABLE 304.3.2—PERFORMANCE OBJECTIVES FOR USE IN ASCE 41 FOR COMPLIANCE WITH REDUCED CRITERIA FORCES

RISK CATEGORY (Based on IBC Table 1604.5)	STRUCTURAL PERFORMANCE LEVEL FOR USE WITH BSE-1E EARTHQUAKE HAZARD LEVEL	STRUCTURAL PERFORMANCE LEVEL FOR USE WITH BSE-2E EARTHQUAKE HAZARD LEVEL
I	Life Safety (S-3). See Note a	Collapse Prevention (S-5)
II	Life Safety (S-3). See Note a	Collapse Prevention (S-5)
III	Damage Control (S-2). See Note a	Limited Safety (S-4). See Note b
IV	Immediate Occupancy (S-1)	Life Safety (S-3). See Note c

International Code Council, 2024 IEBC ©

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75% 64

Chapter 3

- **IEBC 304.3.2:** *Reduced Seismic*

[BS] TABLE 304.3.2—PERFORMANCE OBJECTIVES FOR USE IN ASCE 41 FOR COMPLIANCE WITH REDUCED CRITERIA FORCES

RISK CATEGORY (Based on IBC Table 1604.5)	STRUCTURAL PERFORMANCE LEVEL FOR USE WITH BSE-1E EARTHQUAKE HAZARD LEVEL	STRUCTURAL PERFORMANCE LEVEL FOR USE WITH BSE-2E EARTHQUAKE HAZARD LEVEL
I	Life Safety (S-3). See Note a	Collapse Prevention (S-5)
II	Life Safety (S-3). See Note a	Collapse Prevention (S-5)
III	Damage Control (S-2). See Note a	Limited Safety (S-4). See Note b
IV	Immediate Occupancy (S-1)	Life Safety (S-3). See Note c

International Code Council, 2024 IEBC ©

- BSE-1E (Design Level Earthquake – 225 years)
- BSE-2E (Maximum Considered Earthquake – 975 years)

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75% 65

Chapter 3

- **IEBC 304.3.2:** *Reduced Seismic*
  - **Appendices:** Intended as minimum standards and are established primarily to reduce the loss of life.
    - A1 – URM Buildings
    - A2 – Concrete & Masonry Bldgs w/ Flexible Diaph.
    - A3 – Cripple Walls & Sill Plate Strengthening
    - A4 – Wood-framed Soft-story Buildings

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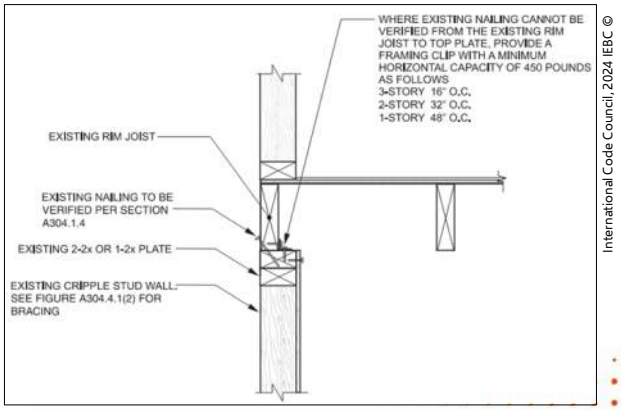
75% 66

Chapter 3

Sample Comment:
As this is a change of occupancy to a higher Risk Category, IEBC 1006.3 requires a "full seismic" evaluation. As such, IEBC 304.3.2 does not allow the use of the Appendices for this evaluation. These can only be used for "reduced seismic" evaluations. Please address.



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Chapter 3

- **IEBC 306:** *Accessibility*
  - Applies to repairs, changes of occupancy, additions and alterations to existing buildings.
  - Accessible means of egress shall be maintained during construction.
  - An alteration or addition cannot decrease accessibility to less than what is required for new construction.

BCS

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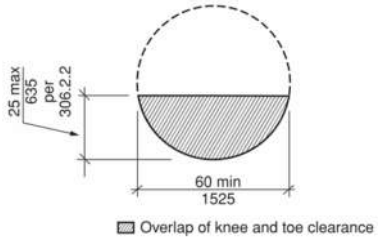
Chapter 3

- **IEBC 306.3:** *Design*
  - Shall be designed and constructed in accordance with this code and the alteration and existing building provisions of ICC A117.1.

A117.1 - New



A117.1 - Existing

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Chapter 3

- **IEBC 306:** *Accessibility*
  - **Repairs** → Accessible features shall be maintained.
  - **Change of Occupancy** → Shall comply with IEBC 306.7.
  - **Additions** → Shall comply with requirements for new construction. Existing areas that are affected shall comply with IEBC 306.7.1.

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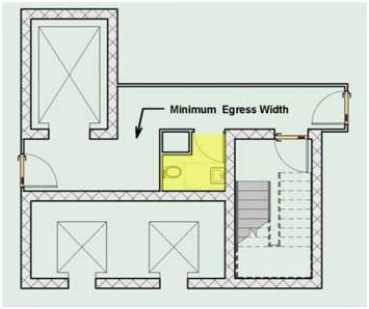
Chapter 3

- **IEBC 306.7:** *Alterations*
  - **Alterations** → Shall comply with…
    - IBC Chapter 11, and…
    - IEBC 306.7.1 through 306.7.16, unless…
  - **Technically infeasible**
    - *"The alteration shall provide access to the maximum extent technically feasible."*



U.S. Access Board, https://www.access-board.gov/

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Chapter 3

- **IEBC 306.7:** *Alterations*
  - **Primary Function Areas** → If the alteration, addition or change of occupancy affects the primary function area an **accessible route** to this area shall be provided.
  - Toilet facilities and drinking fountains serving this area, including the route to, shall be made accessible.
  - **Priority** shall be given to the improvements affecting the accessible route to the primary function area.

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Accessible Route

- **IBC 1104:** *Accessible Route*
  - **Components include:**
    - Public transportation stops (if applicable)
    - Accessible parking
    - Passenger loading zones
    - Public streets or sidewalks to an accessible entrance
    - Route from entrance to primary function areas

BCS

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Chapter 3

- **IEBC 306.7:** *Alterations*
  - **Exceptions…**
    - The cumulative cost of providing the accessible route, toilet facilities and drinking fountain ≤ **20%** cost of alterations
    - Provisions do not apply to alterations limited to…
      - Windows, hardware, operating controls, electrical outlets and signs.
      - Mechanical, electrical and fire protection systems.
      - Alterations undertaken solely to increase accessibility.
      - Altered Type B dwelling or sleeping units.

BCS

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Chapter 3

- **IEBC 306.7:** *Alterations*
  - **Technically Infeasible:** *"The alteration shall provide access to the **maximum extent** technically feasible."*
  - **20% Cost:** *"**Priority** shall be given to the improvements affecting the accessible route to the primary function area."*
  - How do you determine the priority of accessible features?

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Example

- **Section 447.241:** Oregon State Rules
  - In choosing which accessible elements to provide under this section, priority shall be given to those elements that will provide the greatest access. Elements shall be provided in the following order:
    - Parking;
    - An accessible entrance;
    - An accessible route to the altered area;
    - At least one accessible rest room for each sex or a single unisex rest room;
    - Accessible telephones;
    - Accessible drinking fountains; and
    - When possible, additional accessible elements such as storage and alarms.

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Chapter 3

- **IEBC 306:** *Accessible Means of Egress*
  - **IEBC 306.7.2** states that an accessible means of egress is not required in existing building undergoing *alterations* even if IBC Chapter 10 would require it.
  - **IEBC 306.6.1** states that an accessible means of egress must be provided in *additions* where it would be required by IBC 1009.1.
  - If this is provided within the existing building an ***accessible route*** must be provided from the addition to the existing building.

BCS

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Chapter 3

- **IEBC 306:** *Accessible Means of Egress*
  - **IEBC 306.6.1.1** states that if the addition is exclusively being made to accommodate an elevator to improve accessibility, it is not required to meet the accessible means of egress provisions provided:
    - Two-way communication is at each elevator landing
    - Each elevator landing is on a floor with a horizontal exit or stairway having a width ≥ 36 inches
    - Elevator does not serve a floor or roof > 4 stories above LLED

BCS

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Chapter 3

- **IEBC 306.7:** *Alterations*
  - **306.7.3** → Type A individually owned units in Group R-2 can comply with Type B unit.
  - **306.7.4** → Type B dwelling or sleeping units are not required if work area < 50%.
  - **306.7.5** → Altered entrances are not required to be accessible provided an accessible entrance is provided, and…

BCS

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Chapter 3

- **IEBC 306.7:** *Alterations*
  - **306.7.6** → Exterior accessible routes and curb ramps must be at least 36" wide.
  - **306.7.7** → Altered elevators must comply with the elevator code. (ASME A17.1)
  - **306.7.8** → Limited-use/limited-application (LULA) elevators permitted as component of accessible route.

Lifeway Mobility, https://www.lifewaymobility.com/

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Chapter 3

- **IEBC 306.7:** *Alterations*
  - **306.7.9** → Platform lifts in conformance with ASME A18.1 as component of an accessible route.
  - **306.7.10** → If new escalators or stairways are provided, an accessible route is required between levels served.

BCS

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Chapter 3

- **IEBC 306.7:** *Alterations*
  - **306.7.11** → If IBC Chapter 11 requires accessible dwelling or sleeping units, the **number of units** shall be…
    - Accessible Units → Per IBC 1108 but only **based on # added** or altered.
    - Type A → Per IBC 1108 but only applies if > 20 are altered or added.
    - Type B → Per IBC 1108 if > 50% of building area + only applies to those being altered or added.

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Chapter 3

- **IEBC 306.7:** *Alterations*
  - **306.7.12 & 306.7.13** → If technically infeasible to alter, one accessible **single-user toilet or bathing room** is permitted. Must be on the same floor and area as existing toilet/bathing rooms and directional signage provided.
  - **306.7.14** → In **Group A & Group M**, if additional fixtures added → ≥ 1 accessible family or assisted-use toilet room shall be provided per IBC 1110.2.1.

BCS

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Chapter 3

- **IEBC 306.7:** *Alterations*
  - **306.7.15** → Where additional toilet facilities are being added, in occupancies where **adult changing stations** are required by IBC 1110.4.1, not fewer than one accessible family or assisted-use toilet room with an adult changing station shall be provided.

ICC Building Safety Journal, Louis Bedigian, July 31, 2023.

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Chapter 3

- **IEBC 306.7:** *Alterations*
  - **IBC 1110.4.1: Where are they required?**
    1. Group A & M where family or assisted-use toilet or bathing rooms are required.
    2. Group B higher ed where > 12 water closets are required.
    3. Group E where > 6 water closets are required for a space.
    4. Highway rest stops and highway service plazas.

BCS

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Chapter 3

- **IEBC 306.7:** *Alterations*
  - **306.7.16** → If technically infeasible to provide at similar rooms, one accessible **dressing, fitting or locker room** on the same floor is required with directional signage.

Microsoft 365, PowerPoint, Stock Images

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Chapter 3

- **IEBC 306.7:** *Alterations*
  - **306.7.17** → If **amusement rides** are altered to the extent where the ride's performance differs from the original design it shall be made accessible per IBC 111.4.8.

Microsoft 365, PowerPoint, Stock Images

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Chapter 3

- **IEBC 306.7:** *Alterations*
  - **306.7.18 → Historic Structures**
    - Exterior accessible route from site arrival point to accessible entrance.
    - At least one accessible entrance is required (directional signage)
    - Accessible route from accessible entrance to areas on main level
    - At least one accessible single-user toilet room.
    - If bathing facilities provided, one accessible single-user bathing room.
    - Alterations to Type A units in Group R-2 can comply with Type B.
    - Type B units required by IBC 1108 not required in historic buildings.

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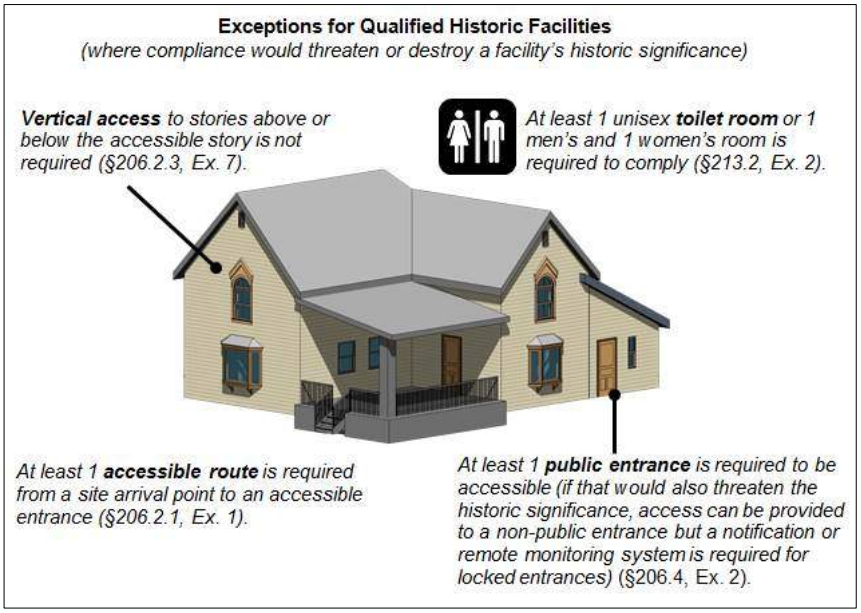

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Chapter 3

- **IEBC 307:** *Smoke Alarms*
  - If Group R or I-1, and…
  - An addition, alteration, change of occupancy or relocation…
  - Shall provide smoke alarms throughout per IFC or IRC
  - *Exception:* Level 1 Alterations

Exceeding Level 1 Alterations

Level 1:
- Replace/remove equipment/fixtures
- Replace wall/roof coverings
- Reroof permits

BCS

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Chapter 3

- **IEBC 308:** *CO Detection*
  - If additions, alterations, a change of occupancy or relocation is made to an existing building…
  - CO detection must be provided per IFC or IRC.
  - ***Exceptions:***
    - Exterior work
    - MEP systems other than fuel-burning appliances
    - Level 1 Alterations
    - Group I-2 where notification is at a constantly attended location

BCS

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Chapter 3

- **IEBC 309:** *Exterior Walls*
  - If an exterior wall covering or exterior wall envelope is added or replaced, and if…
  - Materials and methods shall comply with IBC Chapter 14 & 26.
  - It affects 2+ contiguous stories and is >15% of total wall area on any side of the building… (entire wall must comply)

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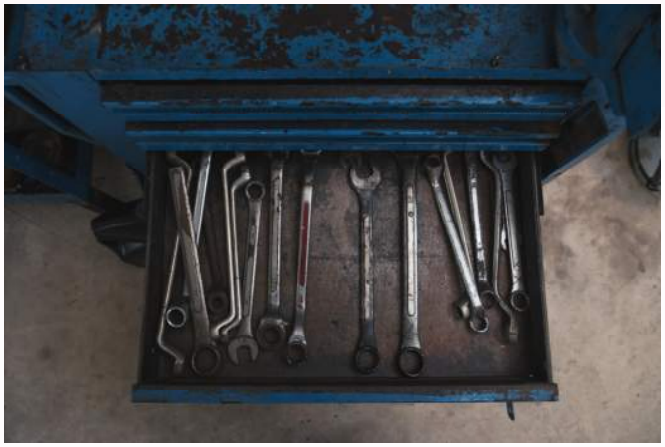
Part 3. Repairs



Microsoft 365, PowerPoint, Stock Images

Repairs

BCS

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Chapter 4

- **IEBC 401:** *General*
  - Shall not make building any less conforming.
  - FHA & substantial improvement → Shall comply with IBC or IRC.

U.S. National Archives, Minot, North Dakota, 2011.

BCS

Repairs

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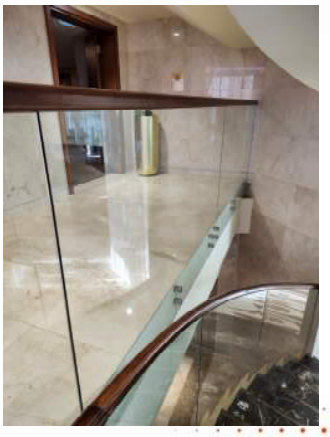
Chapter 4

- **IEBC 402:** *Glazing*
  - Replacement glazing in hazardous locations shall comply with the IBC or IRC.
- **IEBC 403 & 404:** *Fire Protection/M of E*
  - Must maintain level of fire protection and means of egress



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Repairs

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Chapter 4

- **IEBC 405:** *Structural*
  - Dangerous conditions shall be eliminated
  - Structural members and connections per IBC
  - Less Than Substantial → Restored to pre-damaged state

Substantial Structural Damage: Where any of the following apply…

1. Capacity of SFRS has been reduced by > 33% in any direction
2. Gravity members supporting > 30% of a roof or floor area have been reduced by > 20%
3. Members supporting snow loads > 30% of a roof or floor area have been reduced by > 20%

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Repairs

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Chapter 4

- **IEBC 405:** *Structural*
  - If "Substantial Structural Damage"…
    - **Evaluation**
      - LFRS: Must consider IBC load combinations with **"Reduced Seismic"**.
      - Gravity: Must consider IBC dead & live loads.
    - **Compliant** → Pre-damaged state
    - **Noncompliant** → Rehabilitation required

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Repairs

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Chapter 4

- **IEBC 405:** *Structural*
  - If due to snow damage…
  - These must be repaired, replaced or altered to conform to IBC 1608.

Repairs

BCS

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Chapter 4

- **IEBC 405:** *Structural*
  - **FHA** (IEBC 405.2.6):
    - If "substantial damage" → rehabilitated to comply with IBC 1612 or IRC R322.

Allied Foundation, https://www.crackedslab.com/

Repairs

BCS

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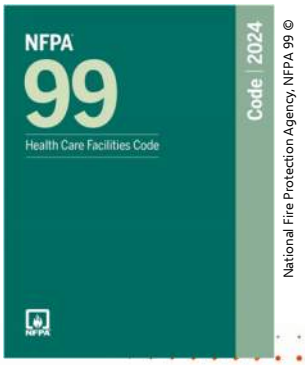
Chapter 4

- **IEBC 406:** *Electrical*
  - Repairs to wiring and electrical equipment must comply with NFPA 70.
  - Reconditioned equipment must comply with NFPA 70 and NFPA 99.
  - Repairs to Group I-2, ambulatory care facilities or outpatient clinics shall comply with NFPA 99.



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Repairs

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Chapter 4

- **IEBC 407:** *Mechanical*
  - Shall not make the building less conforming.
  - Manual draft systems are permitted where…
    - Device shall be listed and installed per Mfr. Instructions
    - Shall produce visible and audible warning upon failure
    - Smoke detector, having battery backup, shall be provided in room with appliance

Wikimedia Commons, Drafting Board

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Repairs

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Chapter 4

- **IEBC 408:** *Plumbing*
  - Materials & supplies shall not be used for repairs that are prohibited in **UPC**.
  - **Water Closet Replacement:**
    - Max. water consumption of 1.6 gallons per flushing cycle.
    - Exception: Blowout design water closets → 3.5 gallons
  - **Health Care Facilities:**
    - Medical gas system repairs in Group I-2, ambulatory care facilities, and outpatient clinics per **NFPA 99**.

Repairs

BCS

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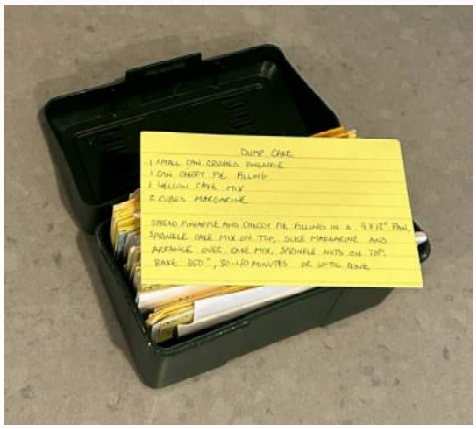
Historic Buildings

- **IEBC 401.1:** *Scope*
  - Repairs to historic building must comply with Chapter 12.
- **IEBC 507.1:** *Historic Buildings*
  - If substantial structural damage → repaired to pre-damaged state.
- **IEBC 1202 & 1205:** *Repairs*
  - Original or like materials may be used.
  - If substantial structural damage → repaired to pre-damaged state.

Repairs

BCS

Part 4. Prescriptive Compliance



Prescriptive

Chapter 5

- **IEBC 501:** *General*
  - **Scope:** Alterations, additions & change of occupancy
  - Includes provisions for historic buildings
  - Group I-2, ambulatory care or outpatient clinics requires compliance with **NFPA 99** for altered or added portions of electrical or med gas systems.
  - Remember, IEBC 301.3.1 requires **full compliance with IFC** as well!

Prescriptive

PRESCRIPTIVE COMPLIANCE METHOD

Additions (IEBC Section 502)

Requires Compliance with 2024 IFC! *(Review IFC Chapter 11)*

Section	Description
502.1	Addition shall comply with IBC
502.1	Existing & addition shall comply with IBC Chapter 5
502.1	New occupiable roofs shall comply with IBC
502.1.1	If addition + existing result in a higher risk category → change of occupancy
502.1.2	Shall not create or extend a nonconformity
502.2	Flood hazard area + substantial improvement → IBC 1612
502.3	5% Gravity rule
502.4	10% Lateral rule
502.5	Smoke compartments in Group I-1, Condition 2 when > 50 care recipients on a story
502.6	Enhanced classroom acoustics

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Chapter 5

- **IEBC 502:** *Additions*
  - Addition shall comply with IBC.
  - The existing building with the addition cannot be less complying than the structure was prior to addition.
  - Combined structure shall comply with the IBC Chapter 5 height & area provisions.
  - If a new occupiable roof is added → must conform to IBC

BCS

Prescriptive

107

Chapter 5

- **IEBC 502:** *Additions*
  - If the addition causes an increase in risk category it shall be considered a change of occupancy (IEBC 506).

TABLE 1604.5—RISK CATEGORY OF BUILDINGS AND OTHER STRUCTURES

RISK CATEGORY	NATURE OF OCCUPANCY
I	Buildings and other structures that represent a low hazard to human life in the event of failure, including but not limited to: • Agricultural facilities. • Certain temporary facilities. • Minor storage facilities.
II	Buildings and other structures except those listed in Risk Categories I, III and IV.
III	Buildings and other structures that represent a substantial hazard to human life in the event of failure, including but not limited to: • Buildings and other structures whose primary occupancy is public assembly with an occupant load greater than 300. • Buildings and other structures containing one or more public assembly spaces, each having an occupant load greater than 300 and a cumulative occupant load of these public assembly spaces of greater than 2,500. • Buildings and other structures containing Group E or Group I-4 occupancies or combination thereof, with an occupant load greater than 250. • Buildings and other structures containing educational occupancies for students above the 12th grade with an occupant load greater than 500. • Group I-3, Condition 1 occupancies. • Any other occupancy with an occupant load greater than 5,000.[a] • Power-generating stations with individual power units rated 75 MW_{ac} (megawatts, alternating current) or greater, water treatment facilities for potable water, wastewater treatment facilities and other public utility facilities not included in Risk Category IV. • Buildings and other structures not included in Risk Category IV containing quantities of toxic or explosive materials that: • Exceed maximum allowable quantities per control area as given in Table 307.1(1) or 307.1(2) or per outdoor control area in accordance with the *International Fire Code*; and • Are sufficient to pose a threat to the public if released.[b]
IV	Buildings and other structures designated as essential facilities and buildings where loss of function represents a substantial hazard to occupants or users, including but not limited to: • Group I-2, Condition 2 occupancies. • Ambulatory care facilities having emergency surgery or emergency treatment facilities. • Group I-3 occupancies other than Condition 1. • Fire, rescue, ambulance and police stations and emergency vehicle garages • Designated earthquake, hurricane or other emergency shelters. • Designated emergency preparedness, communications and operations centers and other facilities required for emergency response. • Public utility facilities providing power generation, potable water treatment, or wastewater treatment. • Power-generating stations and other public utility facilities required as emergency backup facilities for *Risk Category* IV structures. • Buildings and other structures containing quantities of highly toxic materials that: • Exceed maximum allowable quantities per control area as given in Table 307.1(2) or per ou with the *International Fire Code*; and • Are sufficient to pose a threat to the public if released.[b] • Aviation control towers, air traffic control centers and emergency aircraft hangars. • Buildings and other structures having critical national defense functions. • Water storage facilities and pump structures required to maintain water pressure for fire suppression.

International Code Council, 2024 IBC©

Prescriptive

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Chapter 5

- **IEBC 502:** *Additions*
  - Additions shall not create or extend a nonconformity related to:
    - Accessibility
    - Structural strength
    - Supports and attachments for nonstructural components
    - Fire safety
    - Means of egress
    - Capacity of mechanical, plumbing or electrical systems

Prescriptive

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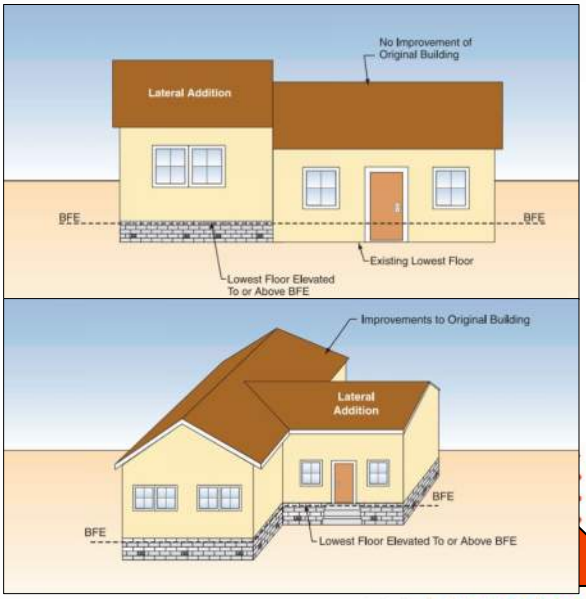
109

Chapter 5

- **IEBC 502:** *Additions*
  - If located within an FHA, and…
    - < substantial improvement, no specific flood design requirements for existing portion.
    - If constitutes a substantial improvement entire structure shall comply with IBC.

Repeated in IEBC 503.2, 701.3, 1103.3, 1402.6



110

Chapter 5

- **IEBC 502:** *Additions*

Gravity - 5% Rule

- **Gravity Structural Elements:**
  - If load to a structural member is increased by > 5%, or…
  - The member capacity is decreased in any way…
  - Shall comply with IBC
  - *Exceptions:*
    - ≤ 5 Group R dwelling or sleeping units & conventional construction

Prescriptive

111

Prescriptive

- **IEBC 502:** *Additions*
  - **Lateral Structural Elements:**
    - If load is increased by > **10%**, or…
    - If capacity is decreased by > **10%**, or…
    - If the alteration results in a structural irregularity…
    - A **seismic evaluation** is required → ***"Full Seismic"***

Lateral – 10% Rule

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Prescriptive

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Chapter 5

- **IEBC 502:** *Additions*
  - If detached the triggers would not apply.

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Prescriptive

113

Chapter 5

- **IEBC 502:** *Additions*
  - 5% rule applies to structural elements and down to foundation, but not the building as a whole.
  - 10% rule, if triggered by one lateral structural element, applies to the building as a whole.
  - When triggered, a seismic evaluation meeting **"Full Seismic"** requirements must be provided.

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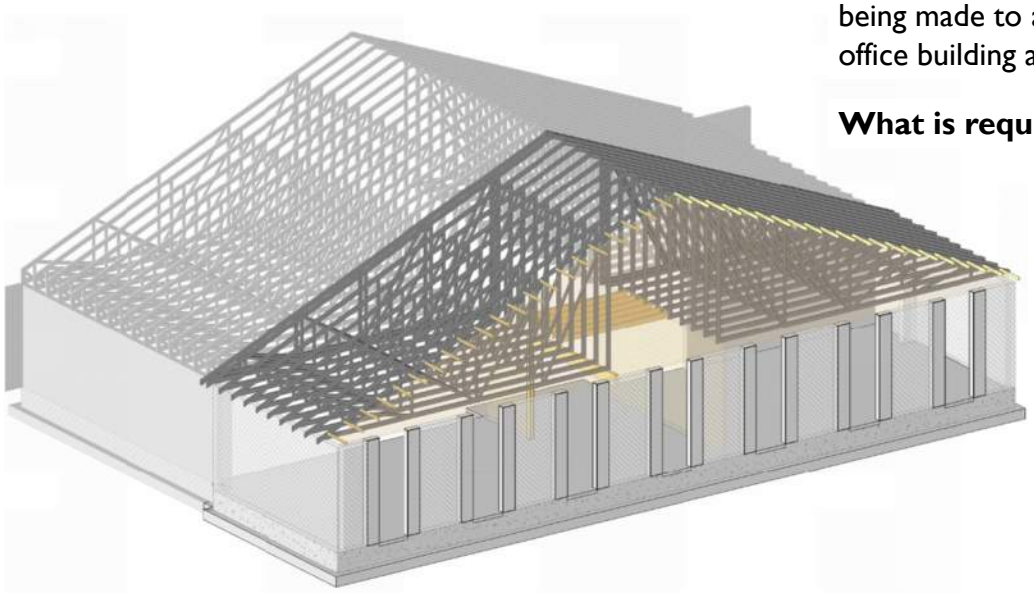

Example: An addition is being made to an existing office building as shown.

What is required?

115

Chapter 5

- **IEBC 502:** *Additions*
  - **Group I-2, Condition 2**
    - Condition 2: Facilities that provide nursing and medical care and could provide emergency care, surgery, obstetrics or in-patient stabilization units for psychiatric or detoxification.
    - If the addition results in 50 care recipients on a story…
    - Not fewer than two smoke compartments shall be provided (IBC 420.6)

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Prescriptive

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Chapter 5

- **IEBC 502:** *Additions*
  - **Enhanced Classroom Acoustics**
    - If addition includes Group E classrooms with a volume of 20,000 cubic feet or less…
    - Enhanced acoustics per Section 808 of ICC A117.1 shall be provided.
    - Assume a ceiling height of 9-feet, that is for any classroom ≤ 2,000 ft²
    - Also added to **IEBC 503.18, 506.6, 903.4, 1011.4, and 1101.6.**

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PRESCRIPTIVE COMPLIANCE METHOD

Alterations (IEBC Sections 503-505)

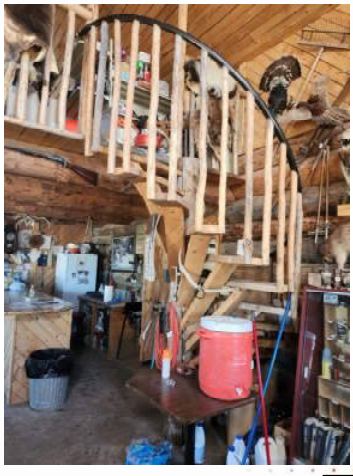
Requires Compliance with 2024 IFC! *(Review IFC Chapter 11)*

Section	Description
503.1	Shall not make the building any less conforming
503.2	Flood hazard area + substantial improvement → IBC 1612
503.3	5% Gravity rule
503.4	10% Lateral rule
503.5	SDC F - Full wind & reduced seismic + nonstructural component bracing
503.6	URM parapet bracing at 25% reroof (SDC 'D-F')
503.7	Roof-to-wall anchorage of concrete & masonry walls if > 50% building is affected (SDC 'C-F')
503.8	Floor- & Roof-to-wall anchorage of URM walls if > 50% building is affected (SDC 'C-F')
503.9	URM parapet bracing if > 50% building is affected (SDC 'C-F')
503.1	Anchorage or URM partitions if > 50% building is affected (SDC 'C-F')
503.11	If > 50% building is affected + substantial structural alteration → Full wind and Reduced Seismic (SDC 'D-F')
503.12	Wind speeds > 130mph and 50% reroof → Roof diaphragm evaluation
503.13	Voluntary upgrades to lateral-force-resisting systems → simply cannot make the building any worse
503.14	Ensure two smoke compartments in Group I-2 if > 30 care recipients on a story
503.15	Reductions in refuge areas cannot cause these to be less than required by IBC
503.16	Group I-1 occupancies where work area > 50% → must state whether Condition 1 or 2
503.16.1	Group I-1, Condition 2 occupancies with > 30 care recipients per story → Ensure two smoke compartments
503.17	Ambulatory care facility & work area > 50% building area → smoke compartment + separation from adjacent uses
503.18	Group E & work area > 505 building area → enhanced classroom acoustics
503.19	Group E, Group B educational and Group I-4 → locking arrangements may comply with IBC 1010.2.7
503.20	If work area > 50% building area & elevator service provided → provide two-way communication
504.1	Fire escapes may be added if ≤ 50% of required exit capacity
505.1	Window replacements per IBC
505.2	Opening control or fall protection shall be provided for Groups R-2 & R-3
505.3	Emergency escape and rescue openings shall comply with IBC unless exceptions are met
505.4	Bars, grilles, covers or screens shall not reduce opening requirements and shall be releasable from the inside without special knowledge or tools

118

Chapter 5

- **IEBC 503:** *Alterations*
  - Alteration shall comply with IBC.
  - Existing structure shall be no less conforming.
    - **Exceptions:** Stairways, handrails, and escalators in below-grade transportation stations



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119

Chapter 5

- **IEBC 503:** *Alterations*
  - **Gravity Structural Elements:**

Gravity - 5% Rule

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Chapter 5

- **IEBC 503:** *Alterations*
  - **Lateral Structural Elements:**
    - If load is increased by > **10%**, or…
    - If capacity is decreased by > **10%**, or…
    - If the alteration results in a structural irregularity…
    - A **seismic evaluation** is required → ***"Reduced Seismic"***
    - *New Exception:*
      - If increase is due to RTU ≤ 400#, and…
      - Total weight of rooftop equipment < 10% of roof dead load.

Lateral – 10% Rule

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Prescriptive

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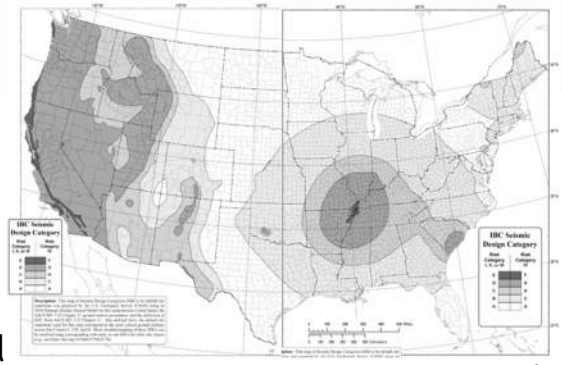
Chapter 5

- **IEBC 503:** *Alterations*
  - Seismic Design Category F, and…
  - > 50% of building area…
  - Full structural evaluation required
    - Full wind & **Reduced seismic**
  - Supports and attachment of nonstructural components must also be evaluated



International Code Council, 2024 IBC©

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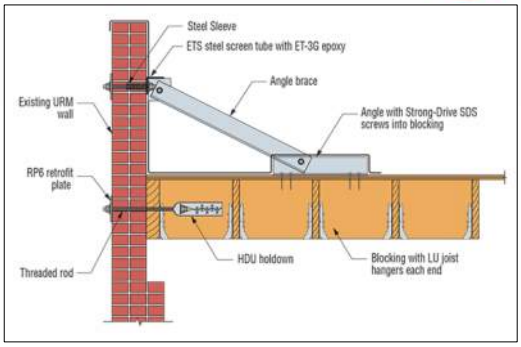
Chapter 5

- **IEBC 503.6:** *URM Parapets*
  - If located in SDC 'D-F', and…
  - >**25%** of roofing is replaced
  - Unreinforced masonry (URM) parapets, and..
  - URM parapets shall be evaluated → **"Reduced Seismic"**



Simpson Strong-Tie, https://www.strongtie.com/

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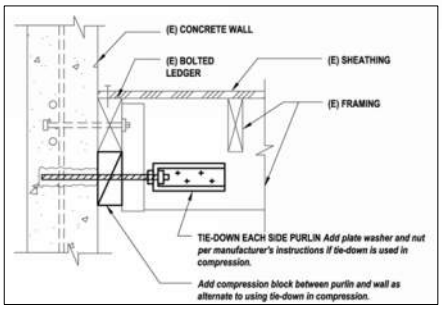
Chapter 5

- **IEBC 503.7:** *Roof-to-Wall Connections*
  - If concrete or reinforced masonry building…
  - With a flexible roof diaphragm, and…
  - Located in SDC 'C-F', and…
  - > 50% of building is undergoing alteration…
  - Roof-to-Wall anchorage evaluation → **"Reduced Seismic"**



Federal Emergency Management Agency, FEMA 547©

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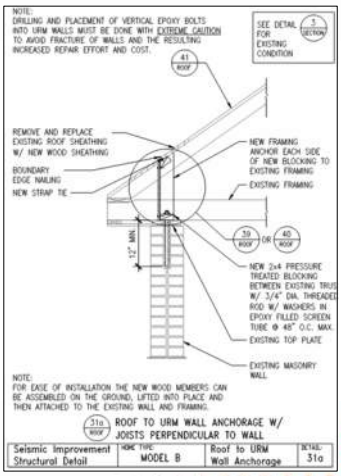
Chapter 5

- **IEBC 503.8:** *Floor/Roof-to-Wall Connections*
  - If URM building and located in SDC 'C-F' and…
  - > 50% of building is undergoing alteration…
  - Floor- and Roof-to-Wall anchorages evaluation → **"Reduced Seismic"**



The Utah Guide for the Seismic Reinforcement of Unreinforced Masonry Dwellings

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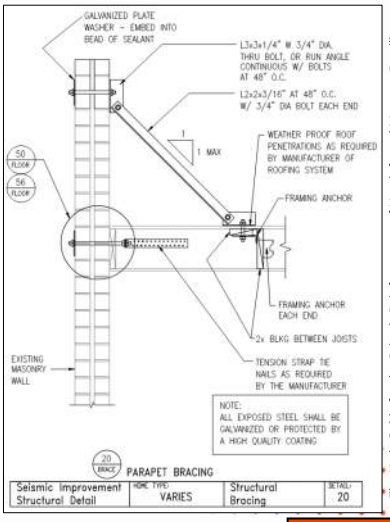
Chapter 5

- **IEBC 503.9:** *URM Parapets*
  - Where located w/in SDC 'C-F' and URM parapets and…
  - > 50% of building is undergoing alteration…
  - Parapets shall be braced
  - Evaluation → **"Reduced Seismic"**



The Utah Guide for the Seismic Reinforcement of Unreinforced Masonry Dwellings

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Chapter 5

- **IEBC 503.10:** *URM Partitions*
  - If URM partitions or nonstructural walls, and…
  - Located in SDC 'C-F', and…
  - > 50% of building is undergoing alteration…
  - URM partitions within the egress path shall be anchored, removed, or altered to resist seismic.
  - Evaluation → **"Reduced Seismic"**

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Chapter 5

Substantial Structural Alteration:
Where gravity elements supporting > 30% of floor or roof area are altered within a 5-year period.

- **IEBC 503.11:** *Substantial Structural Alteration*
  - Where the work involves a substantial structural alteration…
  - And > 50% of building is undergoing alteration…
  - The LFRS shall meet **full wind & "Reduced Seismic"**
  - If in SDC 'D-F' and includes Risk Category IV → supports and attachments of nonstructural components shall be evaluated

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Prescriptive

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Chapter 5

- **IEBC 503.12:** *Roof Diaphragm – High Wind*
  - Where V_{ult} **> 130 mph** and…
  - **> 50% of roofing** materials are being replaced
  - Roof diaphragms and connections, including roof-to-wall connections, shall be evaluated to current IBC wind loads.
  - If capacity is **< 75%** of IBC requirements, they must be replaced or strengthened to show compliance with full IBC wind
  - *Exception:* Buildings compliant with **ASCE 7-88** and later

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Prescriptive

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Chapter 5

- **IEBC 503.13:** *Voluntary LFRS Alterations*
  - Capacity of structural elements cannot be reduced.
  - New structural elements detailed/connected per IBC.
  - New or relocated nonstructural elements are detailed and connected per IBC & ASCE 7.
  - The alterations do not create a structural irregularity or make an existing irregularity more severe.

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Prescriptive

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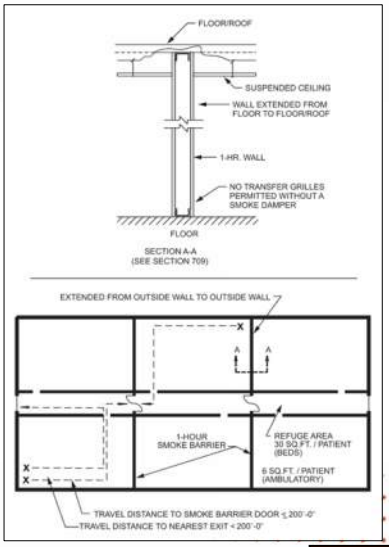
Chapter 5

- **IEBC 503.14:** *Smoke Compartments*
  - Alterations to Group I-2 floors having sleeping rooms serving > 30 care recipients…
  - …shall be divided into ≥ 2 smoke compartments (IBC 407.5)



International Code Council, 2021 IBC Commentary©

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Chapter 5

- **IEBC 503.15:** *Refuge Areas*
  - Cannot reduce the capacity of refuge areas associated with horizontal exits, Groups I-1, I-2 and I-3 and ambulatory care facilities below that required by the IBC.

Maestro Integrations, maestrointegrations.com

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Prescriptive

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Chapter 5

- **IEBC 503.16:** *Group I-1 Occupancies*
  - Group I-1 occupancies having a work area > 50% of aggregate building area shall…
  - Be classified as either Condition 1 or Condition 2.
  - If Group 2 + > 30 care recipients on a floor → 2 smoke compartments

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Prescriptive

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Chapter 5

- **IEBC 503.17:** *Ambulatory Care Facilities*
  - If work area > 50% of building area, and…
  - Ambulatory care facility is > 10,000 SF, and…
  - ≥ 4 care recipients are incapable of self-preservation at any time, …
  - Shall be separated from adjacent spaces by means of a **fire partition** (IBC 422.2).

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Prescriptive

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Chapter 5

- **IEBC 503.19:** *Educational Locking Arrangements*
  - In Group E, Group B educational, and Group I-4 occupancies…
  - …locking arrangements designed to keep intruders from entering room shall comply with IBC 1010.2.8

TeacherLock®, www.teacherlock.com

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Prescriptive

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Chapter 5

- **IEBC 503.20:** *Two-Way Communication*
  - If work area **> 50%** aggregate building area and the building has an **elevator**...
  - Two-way communication must be provided per IBC 1009.8

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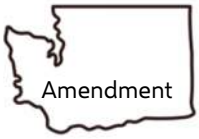
Chapter 5



- **IEBC 503.19 & 805.5:** *URM with Occupant Load Increase*
  - Page 23

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Prescriptive

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Chapter 5

- **IEBC 504:** *Fire Escapes*
  - Not allowed in new buildings.
  - Existing are allowed as a component of means of egress.
  - New fire escapes can be added to existing buildings where exterior stairways cannot be added due to lot lines.

Prescriptive

BCS

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Chapter 5

- **IEBC 504:** *Fire Escapes*
  - Fire escapes cannot provide **>50%** of the required exit capacity.
  - Limitations on location, construction materials, dimensions, and opening protectives.

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Chapter 5

- **IEBC 505:** *Windows and EEROs*
  - Replacement glazing shall be as required for new installations (IBC or IRC).

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Prescriptive

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Chapter 5

- **IEBC 505.2:** *Windows and EEROs*
  - If **upper story window** is replaced opening control devices must be installed if…
    - Groups R-2 & R-3 where…
    - The window is operable, and…
    - The replacement includes sash and frame, and…
    - The top of sill is < 36-inches (24-inches for IRC), and…
    - Window permits the passage of 4-inch sphere, and…
    - Distance from grade is > 72-inches

Andersen Windows & Doors, https://parts.andersenwindows.com/

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Prescriptive

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Chapter 5

- **IEBC 505.3:** *Emergency Escape and Rescue Openings*
  - **Replacement EEROs:** Replacement emergency escape and rescue openings in Groups R-2 and R-3 are exempt from IBC/IRC if…
    - Currently used for that purpose, and…
    - Replacement window is largest size that fits in existing opening and provides for an equal or greater window opening area

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Chapter 5

- **IEBC 505.4:** *Bars, Grilles, Covers or Screens*
  - May be placed over EEROs provided…
    - Must be releasable or removeable from the inside without use of a key, tool or force greater than required for normal operation of EERO.
    - Shall not reduce the required net clear opening.
    - Smoke alarms required per IBC 907.2.11.

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PRESCRIPTIVE COMPLIANCE METHOD

Change of Occupancy (IEBC Section 506)

Requires Compliance with 2024 IFC! *(Review IFC Chapter 11)*

Section	Description
506.1	Shall comply with IBC for use and occupancy
506.2	A certificate of occupancy must be issued
506.3	Limitation on stairways (pitch or slope)
506.4	Existing EERO (reduced requirements)
506.5.1	Live load check *(5% garvity rule applies)*
506.5.2	Snow & wind evaluations if > Risk Category
506.5.3	Seismic if > Risk Category or Groups S or U changed to any other
506.5.4	If provides access to Risk Category IV, it shall be Risk Category IV
506.6	If work area > 50% → Enhanced classroom acoustics

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Chapter 5

- **IEBC 506:** *Change of Occupancy*
  - No change shall be made to the occupancy unless the building is made to comply with the requirements of the IBC for the use.
  - At the **B.O.'s discretion**, the use may be changed without conforming to all IBC requirements provided the new use is less hazardous based on life and fire risk.

Microsoft 365, PowerPoint, Stock Images

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Prescriptive

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Chapter 5

- **IEBC 506:** *Change of Occupancy*
  - What would be an example of less hazardous?
  - Group F-1 to F-2, S-1 to S-2, etc.
  - What about Group B to Group S-2?
  - IEBC 1011 provides some helpful insights.

BCS

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Chapter 5

- **IEBC 506:** *Change of Occupancy*
  - **Certificate of Occupancy:** Shall be issued once the requirements for change of use have been met.
  - **Stairways:** Not required to comply with IBC 1011 where "existing space and construction does not allow a reduction in pitch or slope."

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Chapter 5

- **IEBC 506:** *Change of Occupancy*
  - **Existing EEROs:** If new occupancy requires EEROs, …
    - Operable windows shall have a min. net clear opening of **4.0 SF**, with min net clear height of 22-inches and net clear width of 20-inches.
    - Replacement windows must comply with the above and be the MFR largest standard size to fit in the existing frame or rough opening.
  - Also added to **IEBC 1011.5.6**

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Chapter 5

- **IEBC 506.5:** *Structural*
  - **Live Loads** *(506.5.1)*:
    - Shall comply with IBC 1607
    - ***Exception:*** **5% gravity rule**

TABLE 1607.1
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS, L_o, AND MINIMUM CONCENTRATED LIVE LOADS

	OCCUPANCY OR USE		UNIFORM (psf)	CONCENTRATED (pounds)	ALSO SEE SECTION
1.	Apartments (see residential)		—	—	—
2.	Access floor systems	Office use	50	2,000	—
		Computer use	100	2,000	—
3.	Armories and drill rooms		150[f]	—	—
4.	Assembly areas	Fixed seats (fastened to floor)	60[f]	—	—
		Follow spot, projections and control rooms	50		
		Lobbies	100[f]		
		Movable seats	100[f]		
		Stage floors	150[f]		
		Platforms (assembly)	100[f]		
		Bleachers, folding and telescopic seating and grandstands	100[f] (See Section 1607.19)		
		Stadiums and arenas with fixed seats (fastened to the floor)	60[f] (See Section 1607.19)		
		Other assembly areas	100[f]		
5.	Balconies and decks		1.5 times the live load for the area served, not required to exceed 100	—	—
6.	Catwalks for maintenance and service access		40	300	—
7.	Cornices		60	—	—
8.	Corridors	First floor	100	—	—
		Other floors	Same as occupancy served except as indicated		
9.	Dining rooms and restaurants		100[f]	—	—
10.	Dwellings (see residential)		—	—	—
11.	Elevator machine room and control room grating (on area of 2 inches by 2 inches)		—	300	—
12.	Finish light floor plate construction (on area of 1 inch by 1 inch)		—	200	—
13.	Fire escapes		100	—	—
		On single-family dwellings only	40		
14.	Fixed ladders		See Section 1607.17		—
15.	Garages	Passenger vehicles only	40[f]	See Section 1607.7	—
		Trucks and buses	See Section 1607.8		
16.	Handrails, guards and grab bars		See Section 1607.9		—
17.	Helipads		See Section 1607.6		—
18.	Hospitals	Corridors above first floor	80	1,000	—
		Operating rooms, laboratories	60	1,000	—
		Patient rooms	40	1,000	—
19.	Hotels (see residential)		—	—	—

International Code Council, 2021 IBC ©

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Chapter 5

- **IEBC 506.5.2:** *Snow & Wind*
  - If assigned to a higher risk category…
  - Snow per IBC 1608, and…
  - Wind per IBC 1609
  - ***Exception:*** If area affected is < 10% building area

BCS

TABLE 1604.5
RISK CATEGORY OF BUILDINGS AND OTHER STRUCTURES

RISK CATEGORY	NATURE OF OCCUPANCY
I	Buildings and other structures that represent a low hazard to human life in the event of failure, including but not limited to: • Agricultural facilities. • Certain temporary facilities. • Minor storage facilities.
II	Buildings and other structures except those listed in Risk Categories I, III and IV.
III	Buildings and other structures that represent a substantial hazard to human life in the event of failure, including but not limited to: • Buildings and other structures whose primary occupancy is public assembly with an occupant load greater than 300. • Buildings and other structures containing one or more public assembly spaces, each having an occupant load greater than 300 and a cumulative occupant load of the public assembly spaces of greater than 2,500. • Buildings and other structures containing Group E or Group I-4 occupancies or combination thereof, with an occupant load greater than 250. • Buildings and other structures containing educational occupancies for students above the 12th grade with an occupant load greater than 500. • Group I-2, Condition 1 occupancies with 50 or more care recipients. • Group I-2, Condition 2 occupancies not having emergency surgery or emergency treatment facilities. • Group I-3 occupancies. • Any other occupancy with an occupant load greater than 5,000.[a] • Power-generating stations, water treatment facilities for potable water, wastewater treatment facilities and other public utility facilities not included in Risk Category IV. • Buildings and other structures not included in Risk Category IV containing quantities of toxic or explosive materials that: • Exceed maximum allowable quantities per control area as given in Table 307.1(1) or 307.1(2) or per outdoor control area in accordance with the *International Fire Code*; and • Are sufficient to pose a threat to the public if released.[b]
IV	Buildings and other structures designated as essential facilities, including but not limited to: • Group I-2, Condition 2 occupancies having emergency surgery or emergency treatment facilities. • Ambulatory care facilities having emergency surgery or emergency treatment facilities. • Fire, rescue, ambulance and police stations and emergency vehicle garages • Designated earthquake, hurricane or other emergency shelters. • Designated emergency preparedness, communications and operations centers and other facilities required for emergency response. • Power-generating stations and other public utility facilities required as emergency backup facilities for Risk Category IV structures. • Buildings and other structures containing quantities of highly toxic materials that: • Exceed maximum allowable quantities per control area as given in Tab accordance with the *International Fire Code*; and • Are sufficient to pose a threat to the public if released.[b] • Aviation control towers, air traffic control centers and emergency aircraft hu • Buildings and other structures having critical national defense functions. • Water storage facilities and pump structures required to maintain water pressure for fire suppression.

International Code Council, 2021 IBC ©

Prescriptive

150

Chapter 5

- **IEBC 506.5.3:** *Seismic*
  - **Two triggers…**
  1. Assigned to a higher risk category…
     - Shall comply with IBC 1613 (**"Full Seismic"**)
  2. Was Group S or U and now is any other occupancy…
     - …unless a higher risk category an evaluation per **"Reduced Seismic"**
     - *Exception:* If Group S or U was < 10% of building area

BCS

Prescriptive

151

Chapter 5

- **IEBC 506.5.4:** *Access to Risk Category IV*
  - If it provides operational access to an adjacent Risk Category IV structure, it must comply with the snow, wind and seismic requirements for Risk Category IV.

Google Earth, Salem, Utah City Hall

BCS

Prescriptive

PRESCRIPTIVE COMPLIANCE METHOD

Historic Buildings (IEBC Section 507)

Requires Compliance with 2024 IFC! *(Review IFC Chapter 11)*

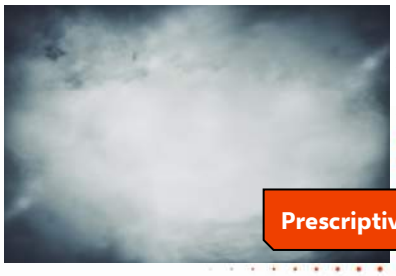
Section	Description
507.1	Improvements are not mandatory unless noted herein
507.2	Items code official feels are a life safety hazard
507.3	Substantial improvement in FHA - exceptions
507.4	Structural provisions of Chapter 5 - exceptions

153

Chapter 5

- **IEBC 507:** *Historic Buildings*
  - Historic buildings are not required to meet the provisions of this chapter except as outlined herein…
  - Items deemed by the code official to be a distinct life safety hazard need to be addressed.

Wikimedia Commons, Midway Town Hall



65, PowerPoint, Stock Images

Prescriptive

BCS

154

Chapter 5

- **IEBC 507:** *Historic Buildings*
  - If in a FHA and consists of a **substantial improvement** it must be brought up to code, unless still classified as historic.
  - All structural provisions of this chapter, except…
    - Code official can limit live loads
    - Substantial structural damage – to pre-existing conditions

Prescriptive

BCS

155

Prescriptive Summary

- Requires compliance with the IFC!
- Flood Hazard Areas → 50% trigger
- Gravity → 5% trigger
- Lateral → 10% trigger
  - Alterations → Reduced Seismic
  - Additions → Full Seismic
  - Change of Occupancy → Could be either

BCS

Prescriptive

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Prescriptive Summary

- > 25% reroof (SDC 'D') → URM parapet bracing
- > 50% reroof (V > 130mph) → Roof diaphragm analysis
- > 50% work area (SDC 'C'):
  - Concrete & masonry wall buildings → roof-to-wall connections
  - URM buildings → floor & roof-to-wall connections
  - URM parapet bracing
  - URM partition bracing/removal

BCS

Prescriptive

157

Prescriptive Summary

- Change of Occupancy
  - Check increased live loads
  - > Risk Category → IBC snow, wind & seismic
  - Group S or U → Reduced seismic evaluation
- Historic buildings → numerous outs
- Voluntary improvements → cannot make it any worse

BCS

Prescriptive

Part 5. Work Area Compliance

PROPORTIONAL APPROACH

LEVEL 1 ALTERATION	LEVEL 2 ALTERATION	LEVEL 3 ALTERATION
Requires compliance with CHAPTER 7	Requires compliance with CHAPTERS 7 and 8	Requires compliance with CHAPTERS 7, 8 and 9

BCS

Work Area

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Reminders

- Chapters 1-3 apply to **all** compliance methods
- All new construction per IBC
- All dangerous/unsafe conditions must be addressed
- Prescriptive assumes **compliance with IFC** → less code requirements specified

BCS

Work Area

160

Chapter 6

- **Classification of Work**
  - Alteration – **Level 1** → Chapter 7
  - Alteration – **Level 2** → Chapters 7 & 8
  - Alteration – **Level 3** → Chapters 7, 8 & 9
  - Change of Occupancy → **Chapter 10**
  - Additions → **Chapter 11**
  - Historic Buildings → **Chapter 12**

BCS

Work Area

161

Chapter 6

- **3 Levels of Alterations**
  - **Level 1:**
    - Replace/remove equipment/fixtures
    - Replace wall/roof coverings
    - Reroof permits
  - **Level 2:**
    - Reconfigure space/systems
    - Add/eliminate doors or windows
    - Add equipment
  - **Level 3:**
    - Based on defined work area
    - Applies where work area exceeds 50% of aggregate building area

BCS

Work Area

162

Chapter 6

- **IEBC 601:** *General*
  - *Work Area:* "The work area… shall be identified on the construction documents."
  - What is the definition of work area?
  - How can it be shown on the plans?
  - The permit application should clearly state the level of alteration (I, II or III) at time of submittal. (Does that happen?)

"That portion or portions of a building consisting of all reconfigured spaces as indicated on the construction documents."

BCS

Work Area

163

Chapter 6

- **Work Area:**
  - Unless there are supplemental requirements, the code should not be applied outside the work area.
  - It is appropriate to allow some "incidental" tasks to occur outside the proposed work area(s).
  - ***Example:*** Lighting upgrades may require wire to be pulled from the work area to an electrical service panel.

BCS

164

Chapter 7

- **Level 1 Alterations:**
  - General removal and replacement of materials regardless of need for maintenance or repair.
  - Examples include:
    - Roof replacement
    - Siding replacement
    - **Replacement** equipment
  - Does not involve reconfigured space.
  - May or may not require plan submittal.

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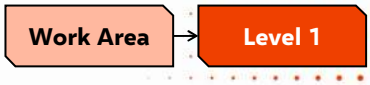


165

Chapter 7

- **IEBC 702:** *Building Elements & Materials*
  - Interior finishes & trim → per Chapter 8
  - EERO window replacement → In Group R-2 & R-3 exempt from the IBC provided largest standard size for existing frame or rough opening.
  - Opening control devices or fall protection shall be provided in replacement Group R-2 & R-3 dwelling units per IEBC 702.4.

BCS

Work Area → Level 1

166

Chapter 7

- **IEBC 705:** *Reroofing*
  - Materials & methods → IBC Chapter 15
  - Structure shall be capable of supporting roof covering
  - **Roof Recover** → Allowed if…
    - Can be installed per MFR recommendations
    - Does not rely on support from existing roof covering
    - Metal panel or tile over wood shake (IEBC 705.4)
    - Protective roof coating over existing covering
  - **Roof Replacement** → Requires tear-off of existing coverings down to roof deck (except ice barrier)

Equipter.com, Tear-off shovels

BCS

Work Area → Level 1

167

Chapter 7

- **IEBC 706:** *Structural*
  - When new roofing or replacement equipment results in additional dead load the supporting structural members must be shown to meet the gravity requirements of the IBC.
  - *Exceptions:*
    - **5% Gravity Rule**
    - Conventional construction, ≤ 5 Group R
    - Addition of 2nd layer & ≤ 3 psf

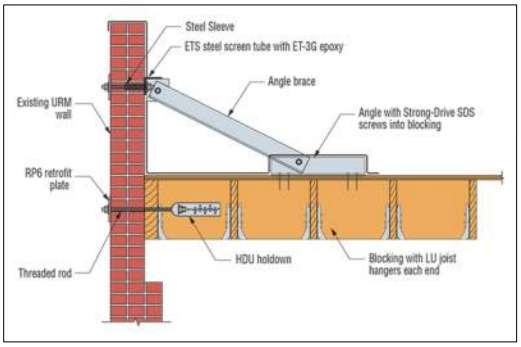
BCS

Work Area → Level 1

168

Chapter 7

- **IEBC 706:** *Structural*
  - If located in SDC 'D-F', and…
  - >**25%** of roofing is replaced
  - Unreinforced masonry (URM) parapets, and..
  - URM parapets shall be evaluated → **"Reduced Seismic"**



Simpson Strong-Tie, https://www.strongtie.com/

BCS

Work Area → Level 1

169

Chapter 7

- **IEBC 706:** *Structural*
  - **Roof Diaphragms in High Wind:**
    - Reroofing > 50%, and…
    - **V > 130mph**
    - Roof diaphragm & connections, including roof-to-wall connections, shall be evaluated.
    - If evaluation shows < 75% of IBC requirement they shall be strengthened.

BCS

Work Area → Level 1

170

Chapter 7

Definition: Unreinforced masonry (URM) consists of clay brick, concrete brick, stone, and other masonry units with little or no steel reinforcing.

1. Will existing roofing materials be removed? *(IEBC 705.2)* Yes _____ No _____
   a. If "No", how many layers of existing roof covering exist? _____
2. Is the additional weight on the roof more than 3psf? Yes _____ No _____
3. Was it built prior to 1975 and include unreinforced masonry parapets? Yes _____ No _____
4. Will more than 50% of the roofing materials be removed? Yes _____ No _____

If the answer to question 2 above is "Yes", please provide an evaluation report from a licensed professional engineer verifying that the existing framing is adequate to support the additional roofing materials as required by Section 706.2 of the 2024 International Existing Building Code.

If the answer to question 3 above is "Yes", please show that adequate unreinforced masonry parapet bracing is provided or submit an engineered design and supporting calculations for new parapet bracing as required by Section 706.3.1 of the 2024 International Existing Building Code.

If the answer to question 4 above is "Yes", and the design wind speed is greater than 130mph, please provide an engineer's evaluation showing that the roof diaphragm connections and roof-to-wall connections are capable of resisting 75% of the IBC wind loads, including uplift, as required by Section 706.3.2 of the 2024 International Existing Building Code.

BCS ELITE

Re-Roofing Questionnaire

The following information shall be provided along with a permit application prior to receiving a re-roofing building permit.

Owner/Contractor Name: _____

Project Address: _____

Contact Phone Number: _____ Contact Email: _____

Building Occupancy: Single Family ☐ Multi-Family ☐ Commercial ☐ Other ☐

Type of Existing Roofing Materials: _____

Type of Proposed Roofing Materials: _____

Type of Existing Roof Deck: _____

Definition: Unreinforced masonry (URM) consists of clay brick, concrete brick, stone, and other masonry units with little or no steel reinforcing.

1. Will existing roofing materials be removed? *(IEBC 705.2)* Yes ____ No ____
   a. If "No", how many layers of existing roof covering exist? _____
2. Is the additional weight on the roof more than 3psf? Yes ____ No ____
3. Was it built prior to 1975 and include unreinforced masonry parapets? Yes ____ No ____
4. Will more than 50% of the roofing materials be removed? Yes ____ No ____

If the answer to question 2 above is "Yes", please provide an evaluation report from a licensed professional engineer verifying that the existing framing is adequate to support the additional roofing materials as required by Section 706.2 of the 2024 International Existing Building Code.

If the answer to question 3 above is "Yes", please show that adequate unreinforced masonry parapet bracing is provided or submit an engineered design and supporting calculations for new parapet bracing as required by Section 706.3.1 of the 2024 International Existing Building Code.

If the answer to question 4 above is "Yes", and the design wind speed is greater than 130mph, please provide an engineer's evaluation showing that the roof diaphragm connections and roof-to-wall connections are capable of resisting 75% of the IBC wind loads, including uplift, as required by Section 706.3.2 of the 2024 International Existing Building Code.

DECLARATION BY OWNER/CONTRACTOR

I certify, under penalty of perjury, that the information on this questionnaire is true and correct.

Signature _____ Date _____

Page 1 of 1 www.BCSElite.com

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171

Chapter 7

- **IEBC 707:** *Electrical*
  - Any altered portion of an electrical system in Group I-2, ambulatory care or outpatient facilities must conform to NFPA 99
- **IEBC 708:** *Energy Conservation*
  - Only the alterations (i.e., new work) should comply with the energy conservation requirements for new construction.
  - This is repeated in **IEBC 809** and **IEBC 907**.

BCS

Work Area → Level 1

172

Chapter 8

- **Alterations – Level 2**

A Concord Carpenter, https://www.aconcordcarpenter.com, Cutting the Concrete Wall

BCS

Work Area → Level 2

173

Chapter 8

- **Level 2 Alterations:**
  - Description:
    - Includes reconfiguration of space
    - Addition or elimination of a door or window
    - Reconfiguration or extension of a system, or
    - Installation of additional equipment
  - Must comply with **IEBC Chapters 7 & 8**

A1 Construction, https://a1constructionlv.com/

BCS

Work Area → Level 2

174

Chapter 8

- **IEBC 801.3:** *System Installations*
  - Work area requirements ***do not apply*** if work only involves…
    - Mechanical, electrical and fire protection systems
    - Abatement of HazMat
    - Windows, hardware, operating controls, electrical outlets or signs
    - Alterations with the primary intent on improving accessibility

BCS

Work Area → Level 2

175

Chapter 8

- **IEBC 802.2:** *Existing Vertical Openings*
  - Interior vertical openings connecting 2+ floors shall be enclosed with 1-hour FR rated assemblies. (within the work area)
    - **14 Exceptions!**
  - If work area > 50%, shaft enclosure requirements shall be met for all openings other than stairways.
  - If work area > 50%, stairways shall be smoketight. (within the work area, outside the work area, and all floors below)

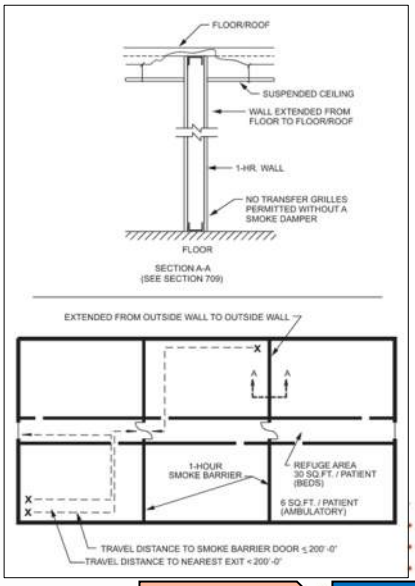
BCS

Work Area → Level 2

176

Chapter 8

- **IEBC 802.3:** *Smoke Compartments*
  - Alterations to Group I-2 floors having sleeping rooms serving > 30 care recipients…
  - …shall be divided into ≥ 2 smoke compartments (IBC 407.5)



International Code Council, 2021 IBC Commentary®

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Work Area → Level 2

177

Chapter 8

- **IEBC 802.4:** *Interior Finish*
  - Level 1 → Wall, ceiling, floor and trim finishes must comply with IBC Chapter 8.
  - ***Level 2*** **→ If > 50% floor area, exits and corridors for entire floor shall comply with IBC Chapter 8**
  - Level 3 → Exits from highest work area floor down to the level of exit discharge shall comply with IBC Chapter 8

BCS

Work Area → Level 2

178

Chapter 8

- **IEBC 802.5 (& 804.12):** *Guards*
  - Required where elevated floors > 30" above floor/grade below
  - Okay if existing, regardless of IBC requirements, unless in ***danger of collapse***.
  - New or replaced per IBC
  - Shall apply for work area down to the level of exit discharge

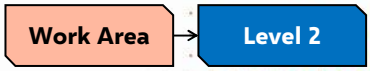
BCS

Work Area → Level 2

179

Chapter 8

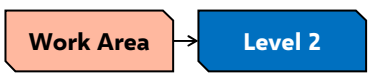
- **IEBC 803.2:** *Fire Sprinklers*
  - Work area shall be sprinklered for the following if…
  - Exits/corridors serving > 1 tenant and > 30 occupants
    - High-rise floors *(If > 50% floor area → entire floor)*
    - Groups A, B, E, F-1, H, I-1, I-2, I-3, M, R-1, R-2, R-4, S-1 & S-2 *(If required by IBC **and** Work Area is > 50% of the floor)*
    - If required by IBC Table 903.2.11.6*
  - Other instances: Group I-2, Windowless stories



BCS

[F]TABLE 903.2.11.6
ADDITIONAL REQUIRED PROTECTION SYSTEMS

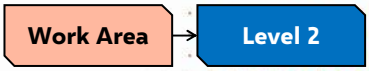
SECTION	SUBJECT
402.5, 402.6.2	Covered and open mall buildings
403.3	High-rise buildings
404.3	Atriums
405.3	Underground structures
407.7	Group I-2
410.6	Stages
411.3	Special amusement buildings
412.2.4	Airport traffic control towers
412.3.6, 412.3.6.1, 412.5.6	Aircraft hangars
415.11.11	Group H-5 HPM exhaust ducts
416.5	Flammable finishes
417.4	Drying rooms
424.3	Play structures
428	Buildings containing laboratory suites
507	Unlimited area buildings
508.5.7	Live/work units
509.4	Incidental uses
1030.6.2.3	Smoke-protected assembly seating
IFC	Sprinkler system requirements as set forth in Section 903.2.11.6 of the *International Fire Code*



181

Chapter 8

- **IEBC 803.3:** *Standpipes*
  - If exits or corridors serving > 1 tenant, and…
  - Work area floor **> 50-feet** from lowest level of fire department access…
  - A standpipe shall be provided.
  - Connections shall be provided at each floor above or below the lowest level of fire department access



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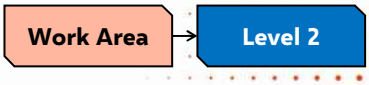
Chapter 8

- **IEBC 803.4:** *Fire Alarm*
  - Required to provide supervision of fire sprinkler systems (803.2.6)
  - Fire alarm systems must be added for Groups E, I-1, I-2, I-3, R-1 and R-2 if required by IFC Chapter 11.
  - If the work area exceeds 50% of the story, alarms shall be installed throughout the story.



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183

Chapter 8

- **IEBC 804:** *Means of Egress*
  - **Addresses the following items:**
    - Exits and corridors serving > 1 tenant
    - Number of exits
    - Allows fire escapes
    - Mezzanines
    - Group A entrances
    - Doors and exit hardware
    - Egress lighting
    - Exit signs
    - Handrails
    - Guards
    - Refuge areas

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Work Area → Level 2

184

Alterations

- **IEBC 804.3:** *Group I-2 Corridors*
  - Where corridors are used for movement of care recipients in beds…
  - …the clear width of ramps and corridors shall be **≥ 48-inches**.

Microsoft 365, PowerPoint, Stock Images

BCS

Work Area → Level 2

185

Alterations

- **IEBC 804.4:** *Refuge Areas*
  - Areas of refuge cannot be reduced below what is required by IBC 407.5.3, 408.6.2, 420.6.1, 422.3.2 and 1026.4

BCS

Work Area → Level 2

186

Alterations

- **IEBC 804.5:** *Number of Exits*
  - If exits or corridors serve > 1 tenant → # exits per Chapter 10

TABLE 1006.2.1—SPACES WITH ONE EXIT OR EXIT ACCESS DOORWAY

OCCUPANCY	MAXIMUM OCCUPANT LOAD OF SPACE	MAXIMUM COMMON PATH OF EGRESS TRAVEL DISTANCE (feet)		
		Without Automatic Sprinkler System (feet)		With Automatic Sprinkler System (feet)
		Occupant Load		
		OL ≤ 30	OL > 30	
A[a], E, M	49	75	75	75[c]
B	49	100	75	100[c]
F	49	75	75	100[c]
H-1, H-2, H-3	3	NP	NP	25[c]
H-4, H-5	10	NP	NP	75[c]
I-1, I-2[d], I-4	10	NP	NP	75[c]
I-3	10	NP	NP	100[c]
R-1	10	NP	NP	75[c]
R-2	20	NP	NP	125[c]
R-3[e]	20	NP	NP	125[c,g]
R-4[e]	20	NP	NP	125[c,g]
S[f]	29	100	75	100[c]
U	49	100	75	75[c]

International Code Council (ICC), 2024 IBC©

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Work Area → Level 2

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Alterations

- **IEBC 804.5:** *Number of Exits*
  - Single-Exit Buildings *(slightly different than the IBC)*:

TABLE 1006.3.4(1)—STORIES AND OCCUPIABLE ROOFS WITH ONE EXIT OR ACCESS TO ONE EXIT FOR R-2 OCCUPANCIES

STORY	OCCUPANCY	MAXIMUM NUMBER OF DWELLING UNITS	MAXIMUM EXIT ACCESS TRAVEL DISTANCE
Basement, first, second or third story above grade plane and occupiable roofs over the first or second story above grade plane	R-2[a,b,c]	4 dwelling units	125 feet
Fourth story above grade plane and higher	NP	NA	NA

International Code Council (ICC), 2024 IBC©

TABLE 804.5.1.1(1)—STORIES WITH ONE EXIT OR ACCESS TO ONE EXIT FOR R-2 OCCUPANCIES

STORY	OCCUPANCY	MAXIMUM NUMBER OF DWELLING UNITS	MAXIMUM EXIT ACCESS TRAVEL DISTANCE
Basement, first, second or third story above grade plane and occupiable roofs over the first or second floor above grade plane	R-2[a,b,c]	4 dwelling units	125 feet
Fourth story above grade plane and higher	NP	NA	NA

International Code Council (ICC), 2024 IEBC©

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Level 2

TABLE 1006.3.4(2)—STORIES AND OCCUPIABLE ROOFS WITH ONE EXIT OR ACCESS TO ONE EXIT FOR OTHER OCCUPANCIES

STORY AND OCCUPIABLE ROOF	OCCUPANCY	MAXIMUM OCCUPANT LOAD PER STORY AND OCCUPIABLE ROOF	MAXIMUM EXIT ACCESS TRAVEL DISTANCE (feet)
First story above or below grade plane and occupiable roofs over the first story above grade plane	A, B[b], E, F[b], M, U	49	75
	H-2, H-3	3	25
	H-4, H-5, I, R-1, R-2[a,c]	10	75
	S[b,d]	29	75
Second story above grade plane	B, F, M, S[d]	29	75
Third story above grade plane and higher	NP	NA	NA

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TABLE 804.5.1.1(2)—STORIES WITH ONE EXIT OR ACCESS TO ONE EXIT FOR OTHER OCCUPANCIES

STORY OR OCCUPIABLE ROOF	OCCUPANCY	MAXIMUM OCCUPANT LOAD PER STORY	MAXIMUM EXIT ACCESS TRAVEL DISTANCE (feet)
First story above or below grade plane or occupiable roofs over the first story above grade plane	B[b], F-2[b]	49	75
	S-2[a,b]	35	75
Second story above grade plane	B, F-2, S-2[a]	35	75
Third story above grade plane and higher	NP	NA	NA

International Code Council (ICC), 2024 IEBC©

Work Area → Level 2

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Alterations

- **IEBC 804.5:** *Number of Exits*
  - Single-Exit Buildings *(continued)*:
    - Unsprinklered Groups R-1 or R-2 Occupant may have a single exit provided…
      - Occupant load ≤ 10 and exit access travel distance w/in unit ≤ 75-feet, or…
      - ≤ 3 stories with exit access doorway on 2nd story and the exit access travel distance from the door to any habitable room is ≤ 50-feet.
    - Group R-2 with ≤ 4 units per floor provided…
      - Served by interior exit stairway, and…
      - Exit access travel distance from front door to the exit is ≤ 20-feet.

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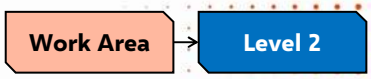

190

Alterations

- **IEBC 804.5.1.2:** *Fire Escapes*
  - Not allowed as means of egress in new construction.
  - Existing may remain as means of egress.
  - New escapes may only be used "…where exterior stairs cannot be utilized…"
  - New escapes shall not incorporate ladders or access by windows.
  - Clear construction requirements outlined in this section.

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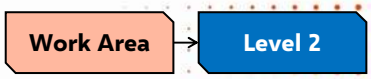


191

Alterations

- **IEBC 804.5.2:** *Mezzanines*
  - Two exits are required when…
    - > 50 occupants, or…
    - > 75-foot travel distance

Wikimedia Commons, Industrial Mezzanine

BCS

Work Area → Level 2

192

Alterations

- **IEBC 804.5.3:** *Main Entrance*
  - Group A – Main Entrance
    - If Group A ≥ 300 occupants…
    - Main entrance must accommodate 50% of the occupant load

Wikimedia Commons, Broadway Theater

BCS

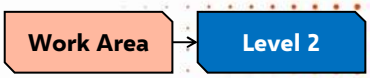
Work Area → Level 2

193

Alterations

- **IEBC 804.6:** *Egress Doors*
  - 2 Egress Doorways required if…
    - > 50 occupants, or…
    - > 75-feet travel distance, or…
    - When required by IBC 407.4.4 – 407.4.4.7.2 for Group I-2, Condition 2
  - If > 50 occupants → Door swing in direction of egress travel
    - If > 50% floor area → entire floor shall comply

BCS

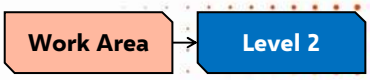


194

Alterations

- **IEBC 804.6:** *Egress Doors (cont.)*
  - If open into exit stairway or exit passageway → self/automatic closing
    - If > 50% floor area → extend down to level of exit discharge
  - If Group A and > 100 occupants → Panic or fire exit hardware
    - If > 50% floor area → entire floor shall comply
  - Power-operated doors in Group I-3 → provide emergency power

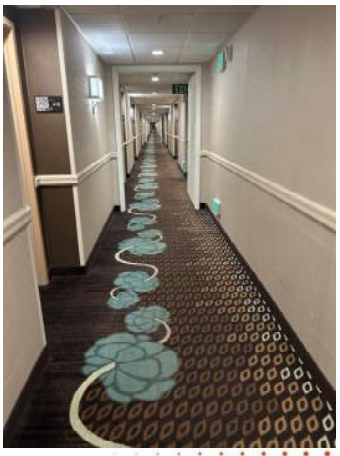
BCS



195

Alterations

- **IEBC 804.7:** *Corridors*
  - No hollow core wood, or doors with louvers.
  - Dwelling and sleeping units
    - 1-3/8" solid or equivalent (20 min.)
    - Door closers
  - Transoms: Either ¼-inch wired glass or fire rated.
  - Other Openings: Shall be sealed with materials consistent with the corridor construction.
  - If > 50% → These provisions apply to entire floor



Work Area → Level 2

BCS

196

Alterations

- **IEBC 804.8:** *Dead-End Corridors*
  - Dead-end corridors ≤ 35 feet
    - Group I-2 ≤ 30 feet
  - *Exceptions:*
    - If allowed for new construction
    - ≤ 50 feet if sprinkled (not Groups A, I-2 or H)

Work Area → Level 2

BCS

197

Alterations

- **IEBC 804.9:** *Means of Egress Lighting*
  - Artificial lighting in accordance with the IBC.
    - IBC 1008.2.1 → Now **10 footcandles** when in use!
  - If work area > 50% of floor, means-of-egress lighting shall be provided for the entire floor.

Work Area → Level 2

BCS

198

Alterations

- **IEBC 804.10:** *Exit Signs*
  - Exit signs in work areas per the IBC.
  - If work area > 50% of floor, exit signs shall be provided for the entire floor.
  - Level 3 → Shall be provided from highest floor work area to the level of exit discharge

Work Area → Level 2

BCS

199

Alterations

- **IEBC 804.11:** *Stairways*
  - If spaces does not allow a reduction in pitch or slope, existing stairways need not comply with IBC 1011.
- **IEBC 804.12:** *Escalators*
  - If existing escalators serve below-grade transportation facilities, a clear width of < 32 inches if allowed.

BCS

Work Area → Level 2

200

Alterations

- **IEBC 804.13:** *Handrails*
  - At least one handrail where ≥ 3 risers
  - Existing cannot be in danger of collapse
  - If > 66-inches → handrail on each side
  - Design new handrails per the requirements of the IBC

BCS

Work Area → Level 2

201

Chapter 8

- **IEBC 805:** *Structural*
  - **Gravity Structural Elements:**

Gravity - 5% Rule

- *Exceptions:*
  - ≤ 5 Group R dwelling or sleeping units & conventional construction
  - Additional layer of roofing ≤ 3psf

BCS

Work Area → Level 2

202

Chapter 8

- **IEBC 805:** *Structural*
  - **Lateral Structural Elements:**

Lateral – 10% Rule

- A **seismic evaluation** is required → ***"Reduced Seismic"***

BCS

Work Area → Level 2

203

Chapter 8

- **IEBC 805:** *Structural*
  - **Voluntary LFRS Alterations:**
    - An engineering analysis is required!
    - Analysis must include the following…
      - Show existing elements not reduced.
      - New structural elements are detailed/connected per IBC.
      - New or relocated nonstructural elements are detailed/ connected per IBC.
      - A structural irregularity is not created or worsened.

Microsoft 365, PowerPoint, Stock Images

BCS

Work Area → Level 2

204

Chapter 8

- **IEBC 806:** *Electrical*
  - All new work per the NEC
  - Wiring in Groups A-1, A-2, A-5, H and I occupancies may require upgrades
  - Group I-2, ambulatory care and outpatient clinics → altered systems must comply with NFPA 99
  - Groups R-2, R-3, R-4 & IRC → minimum requirements for electrical outlets and lighting within work area

BCS

Work Area → Level 2

205

Chapter 8

- **IEBC 807:** *Mechanical*
  - Reconfigured spaces to have natural ventilation, or…
  - Mechanical ventilation per IMC
  - Altered existing systems
    - Provide 5 CFM/person outdoor air
    - Provide 15 CFM/person of ventilation air
  - Local exhaust required to protect air quality

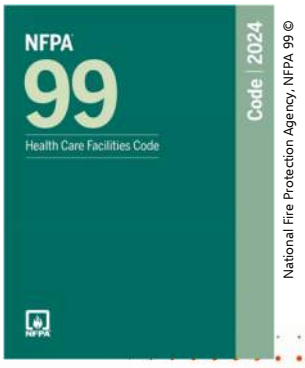
BCS

Work Area → Level 2

206

Chapter 8

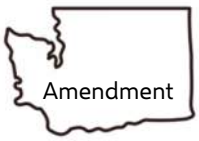
- **IEBC 808:** *Plumbing*
  - Added portions of medical gas systems in…
  - Group I-2, ambulatory care or outpatient clinics…
  - Shall comply with NFPA 99.



BCS

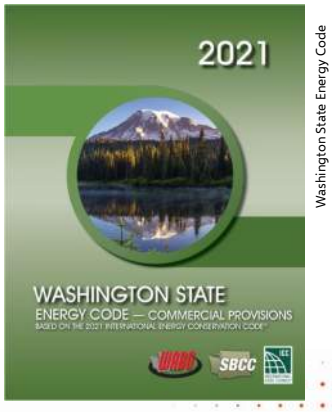
Work Area → Level 2

207



Chapter 8

- **IEBC 809:** *Energy Conservation*
  - The alterations themselves are required to conform to the **WSEC** or IRC.



Washington State Energy Code

BCS

Work Area → Level 2

208

Chapter 9

- **Alterations – Level 3**

University of Missouri, Clark Hall Renovation

BCS

Work Area → Level 3

209

Chapter 9

- **Level 3 Alterations:**
  - **IEBC 604.1:** Alterations where work area > 50% *aggregate building area*.
  - Must comply with Chapters 7, 8 & 9
  - ***Exception:*** The reconfiguration is exclusively for accessibility improvements.

Work Area → Level 3

BCS

EXISTING BUILDING INFORMATION

PER SECTION 504.1 OF THE EXISTING BUILDING CODE THIS PROJECT IS CONSIDERED A LEVEL 1 ALTERATION. PER SECTION 804.2.2, EXCEPTION 2 THE AREA OF ALTERATION IS LESS THAN 50% OF THE TOTAL FLOOR AREA.

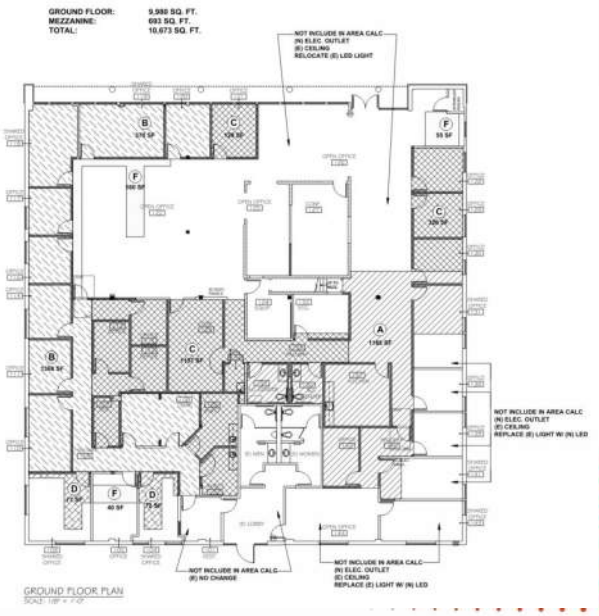
EXISTING BUILDING:	8,929 SQ. FT.	
LEVEL 1 ALTERATIONS:	4,522 SQ. FT.	50.64%
LEVEL 2 ALTERATIONS:	2,793 SQ. FT.	31.28%
AREA OF ADDITION:	2,059 SQ. FT.	
AREA OF NO SCOPE:	1,614 SQ. FT.	18.08%
TOTAL BUILDING AREA:	10,988 SQ. FT.	

(AREA OF LEVEL 2 ALTERATIONS IS 31% OF EXISTING BUILDING AREA)

1 KEY PLAN - FOR REFERENCE ONLY

211

CONSTRUCTION AREA CALCULATION		
AREA TAG	DESCRIPTION	SQ. FT.
A	(N) WALLS, (N) CEILING GRID OR DRYWALL, (N) ELEC. OUTLETS, (N) LED LIGHTS	1188
B	(N) WALLS, PARTIAL CEILING GRID PATCHING, (N) ELEC. OUTLETS, (N) OR RELOCATE LED LIGHTS	1738
C	(N) WALLS, (E) CEILING GRID, (N) ELEC. OUTLETS, RELOCATE LED LIGHTS	1606
D	(N) WALL ON ONE SIDE OF ROOM WITH AREA OF CEILING PATCH, (N) ELEC. OUTLETS, (E) & RELOCATE LED LIGHTS	149
F	CEILING GRID PATCHING ONLY	255
TOTAL		4936
BLDG. TOTAL		10673
% OF BLDG.		46.25%



BCS

212

Chapter 9

- **IEBC 902:** *Special Occupancies*
  - **High-Rises:**
    - Recirculating air or exhaust > 15,000 CFM add smoke or heat detection per IMC if missing
    - One elevator compliant with the Elevator Code
  - **Boiler & Furnace Rooms:**
    - Adjacent to or within I-1, I-2, I-4, R-1, R-2, R-4 shall be enclosed by 1-hour fire-rated construction.

BCS

Work Area → Level 3

213

Chapter 9

- **IEBC 902:** *Special Occupancies*
  - **Group I-1:**
    - Must state whether it is Condition 1 or Condition 2
    - If Group I-1, Condition 2 & > 30 care recipients a minimum of two smoke compartments must be provided on the level
  - **Ambulatory Care Facilities:**
    - If > 10,000 SF a smoke compartment must be provided
    - Must be separated from adjacent spaces

BCS

Work Area → Level 3

214

Chapter 9

- **IEBC 903:** *Building Elements & Materials*
  - **Existing Stairways:** If part of the means of egress and enclosure required per IEBC 802.2, must be provided from the highest work area floor to the **level of exit discharge and all floors below**.
  - **Interior Finish:** Exits from highest work area floor down to the level of exit discharge shall be provided.
  - **Enhanced classroom acoustics** (< 20,000 ft^3)

BCS

Work Area → Level 3

215

Chapter 9

- **IEBC 903.2:** *Fire Partitions in Group R-3*
  - If work occurs within an attached Group R-3 or townhome, and…
  - Walls separating the dwelling units are not continuous from the foundation to the underside of the roof sheathing…
  - **Continuity shall be provided.**
  - *Exception:* If finishes are not removed as part of work continuity through concealed floor spaces is not required.

BCS

Work Area → Level 3

216

Chapter 9

- **IEBC 904.1:** *Fire Sprinklers*
  - Level 3 additional provisions:
    - Work areas of high-rises
    - Rubbish & linen chutes
    - Upholstered furniture or mattress *(Groups F-1, M or S-1)*
    - A, B, E, F-1, H, I-1, I-2, I-3, I-4, M, R-1, R-2, R-4, S-1 and S-2 (per IBC)
    - Windowless stories
    - If required by IBC Table 903.2.11.6

BCS

Work Area → Level 3

[F] TABLE 903.2.11.6—ADDITIONAL REQUIRED PROTECTION SYSTEMS	
SECTION	SUBJECT
402.5, 402.6.2	Covered and open mall buildings
403.3	High-rise buildings
404.3	Atriums
405.3	Underground structures
407.7	Group I-2
410.6	Stages
411.3	Special amusement buildings
412.2.4	Airport traffic control towers
412.3.6, 412.3.6.1, 412.5.6	Aircraft hangars
415.11.11	Group H-5 HPM exhaust ducts
416.5	Flammable finishes
417.4	Drying rooms
424.3	Play structures
428	Buildings containing laboratory suites
507	Unlimited area buildings
508.5.7	Live/work units
509.4	Incidental uses
1030.6.2.3	Smoke-protected assembly seating
IFC	Automatic sprinkler system requirements as set forth in Section 903.2.11.6 of the *International Fire Code*

Many of Level 2 and Level 3 requirements are exempt if insufficient water supply exists

Work Area → Level 3

218

Chapter 9

- **IEBC 904.2:** *Fire Alarms*
  - Level 3 → Fire alarm system shall be installed if required by the IBC for new construction.
  - Manual fire alarms shall be provided throughout work area and notification devises throughout floor shall be activated.
  - If required by the IBC, automatic fire detection shall be provided *[Group I-2 (IBC 407); Group H (IBC 415.3); Group I-1 (IBC 420.7)]*

Work Area → Level 3

BCS

219

Chapter 9

- **IEBC 905:** *Means of Egress*
  - **Means of Egress Lighting** → Shall be provided from highest floor work area to the level of exit discharge
  - **Exit Signs** → Shall be provided from highest floor work area to the level of exit discharge
  - **Two-Way Communication System** → In buildings with elevator service, a two-way communication system shall be provided.

BCS

Work Area → Level 3

220

Chapter 9

- **IEBC 906:** *Structural*
  - **Substantial Structural Alterations:**
    - What is a "Substantial Structural Alteration"?
    - Must comply with "Full Wind" (IBC 1609) and **"Reduced Seismic"** (IBC 1613).
    - The 10% Rule does not apply!

Substantial Structural Alteration: Where gravity elements supporting > 30% of floor or roof area are altered within a 5-year period.

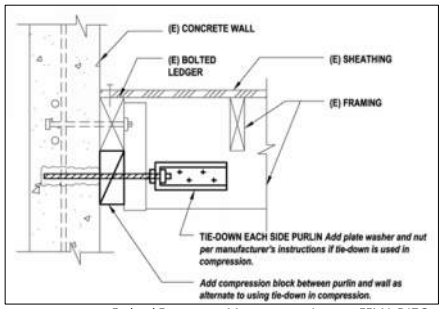
BCS

Work Area → Level 3

221

Chapter 9

- **IEBC 906.4:** *Wall Anchorage*
  - **Concrete & Masonry Buildings:**
    - SDC 'D-F', and…
    - A flexible roof…
    - Wall anchors at roof line **("Reduced Seismic")**



Federal Emergency Management Agency, FEMA 547©

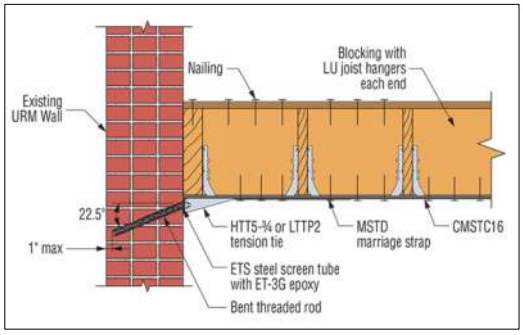
BCS

Work Area → Level 3

222

Chapter 9

- **IEBC 906.5:** *URM Anchorage*
  - SDC 'C-F'
  - Wall anchors at both the floor ***and*** the roof lines
  - **"Reduced Seismic"**



Simpson Strong-Tie, Retrofit Applications

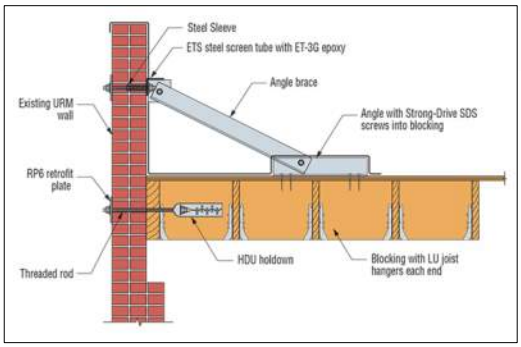
BCS

Work Area → Level 3

223

Chapter 9

- **IEBC 906.6:** *URM Parapet Bracing*
  - SDC 'C-F'
  - Evaluation → **"Reduced Seismic"**



Simpson Strong-Tie, https://www.strongtie.com/

BCS

Work Area → Level 3

224

Chapter 9

- **IEBC 906.7:** *URM Partitions*
  - SDC 'C-F', and…
  - Partitions within work area and adjacent to egress path…
  - Anchored, removed, or altered to resist out-of-plane forces
  - Evaluation per **"Reduced Seismic"**

BCS

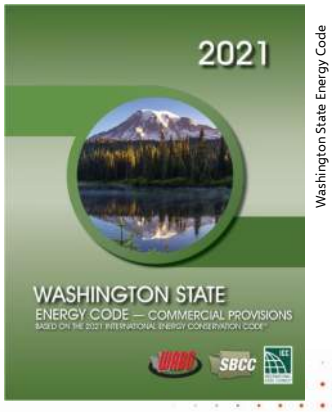
Work Area → Level 3

225

Amendment

Chapter 9

- **IEBC 907:** *Energy Conservation*
  - The alterations themselves are required to conform to the **WSEC** or IRC.



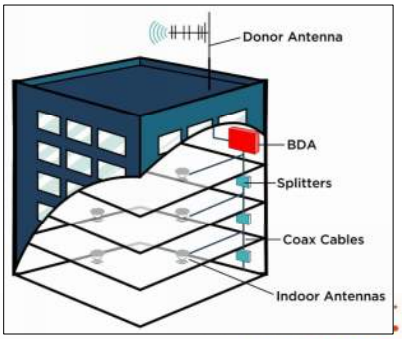
BCS

Work Area → Level 3

226

Chapter 9

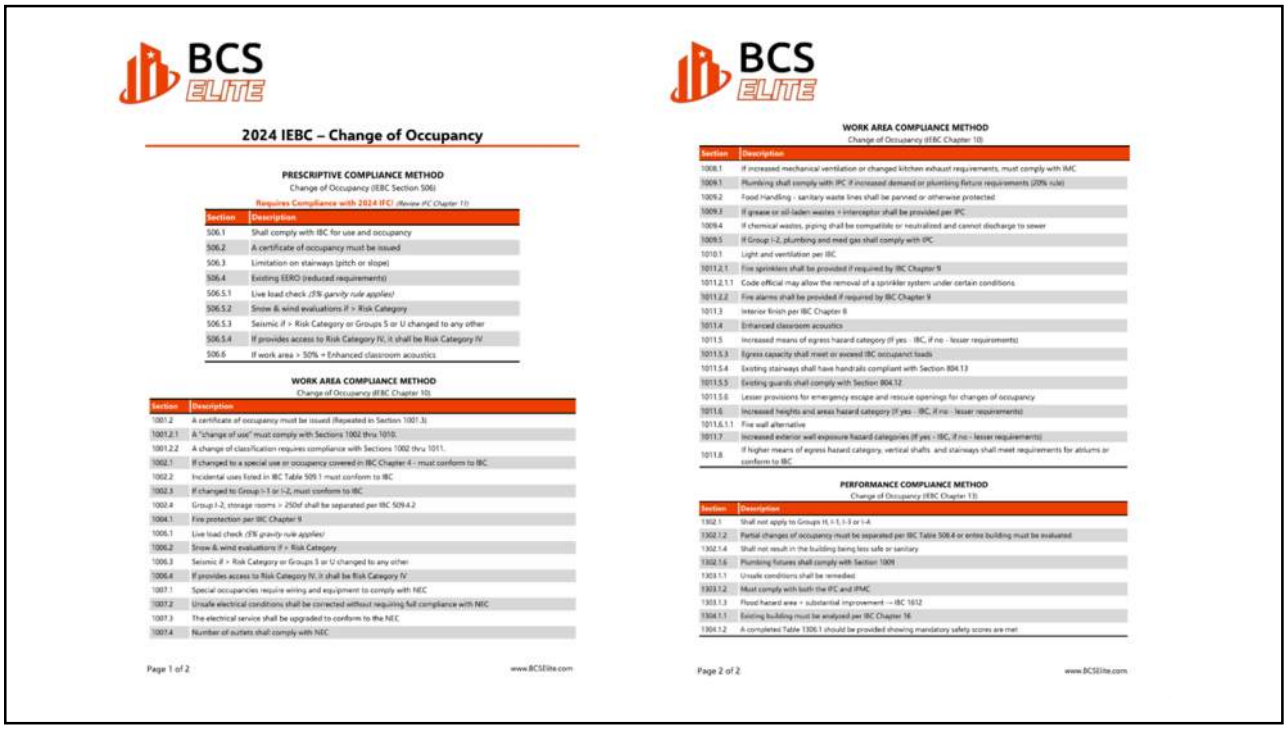
- **IEBC 908:** *ERCES*
  - Existing building must undergo an evaluation of the emergency responder communication signal strength.
  - If insufficient, an emergency responder communication enhancement systems (ERCES) must be provided. *(see IFC 510)*
  - *Exception:* Not required by fire code official



https://nationaltrainingcenter.com/demystifying-erces/

BCS

Work Area → Level 3



BCS ELITE

2024 IEBC – Change of Occupancy

PRESCRIPTIVE COMPLIANCE METHOD

Change of Occupancy (IEBC Section 506)

Requires Compliance with 2024 IFC! (Review IFC Chapter 11)

Section	Description
506.1	Shall comply with IBC for use and occupancy
506.2	A certificate of occupancy must be issued
506.3	Limitation on stairways (pitch or slope)
506.4	Existing EERO (reduced requirements)
506.5.1	Live load check *(5% garvity rule applies)*
506.5.2	Snow & wind evaluations if > Risk Category
506.5.3	Seismic if > Risk Category or Groups S or U changed to any other
506.5.4	If provides access to Risk Category IV, it shall be Risk Category IV
506.6	If work area > 50% → Enhanced classroom acoustics

WORK AREA COMPLIANCE METHOD

Change of Occupancy (IEBC Chapter 10)

Section	Description
1001.2	A certificate of occupancy must be issued (Repeated in Section 1001.3)
1001.2.1	A "change of use" must comply with Sections 1002 thru 1010.
1001.2.2	A change of classification requires compliance with Sections 1002 thru 1011.
1002.1	If changed to a special use or occupancy covered in IBC Chapter 4 - must conform to IBC
1002.2	Incidental uses listed in IBC Table 509.1 must conform to IBC
1002.3	If changed to Group I-1 or I-2, must conform to IBC
1002.4	Group I-2, storage rooms > *250sf* shall be separated per IBC 509.4.2
1004.1	Fire protection per IBC Chapter 9
1005.1	Live load check *(5% gravity rule applies)*
1006.2	Snow & wind evaluations if > Risk Category
1006.3	Seismic if > Risk Category or Groups S or U changed to any other
1006.4	If provides access to Risk Category IV, it shall be Risk Category IV
1007.1	Special occupancies require wiring and equipment to comply with NEC
1007.2	Unsafe electrical conditions shall be corrected without requiring full compliance with NEC
1007.3	The electrical service shall be upgraded to conform to the NEC
1007.4	Number of outlets shall comply with NEC

Page 1 of 2 www.BCSElite.com

BCS ELITE

WORK AREA COMPLIANCE METHOD

Change of Occupancy (IEBC Chapter 10)

Section	Description
1008.1	If increased mechanical ventilation or changed kitchen exhaust requirements, must comply with IMC
1009.1	Plumbing shall comply with IPC if increased demand or plumbing fixture requirements (20% rule)
1009.2	Food Handling - sanitary waste lines shall be parved or otherwise protected
1009.3	If grease or oil-laden wastes = interceptor shall be provided per IPC
1009.4	If chemical wastes, piping shall be compatible or neutralized and cannot discharge to sewer
1009.5	If Group I-2, plumbing and med gas shall comply with IPC
1010.1	Light and ventilation per IBC
1011.2.1	Fire sprinklers shall be provided if required by IBC Chapter 9
1011.2.1.1	Code official may allow the removal of a sprinkler system under certain conditions
1011.2.2	Fire alarms shall be provided if required by IBC Chapter 9
1011.3	Interior finish per IBC Chapter 8
1011.4	Enhanced classroom acoustics
1011.5	Increased means of egress hazard category (if yes - IBC, if no - lesser requirements)
1011.5.3	Egress capacity shall meet or exceed IBC occupancy loads
1011.5.4	Existing stairways shall have handrails compliant with Section 804.13
1011.5.5	Existing guards shall comply with Section 804.12
1011.5.6	Lesser provisions for emergency escape and rescue openings for changes of occupancy
1011.6	Increased heights and areas hazard category (if yes - IBC, if no - lesser requirements)
1011.6.1.1	Fire wall alternative
1011.7	Increased exterior wall exposure hazard categories (if yes - IBC, if no - lesser requirements)
1011.8	If higher means of egress hazard category, vertical shafts and stairways shall meet requirements for atriums or conform to IBC

PERFORMANCE COMPLIANCE METHOD

Change of Occupancy (IEBC Chapter 13)

Section	Description
1302.1	Shall not apply to Groups H, I-1, I-3 or I-4
1302.1.2	Partial changes of occupancy must be separated per IBC Table 508.4 or entire building must be evaluated
1302.1.4	Shall not result in the building being less safe or sanitary
1302.1.6	Plumbing fixtures shall comply with Section 1009
1303.1.1	Unsafe conditions shall be remedied
1303.1.2	Must comply with both the IFC and IPMC
1303.1.3	Flood hazard area + substantial improvement → IBC 1612
1304.1.1	Existing building must be analyzed per IBC Chapter 16
1304.1.2	A completed Table 1306.1 should be provided showing mandatory safety scores are met

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Chapter 10

- **Change of Occupancy**

Any of the following shall be considered as a change of occupancy where the current (IBC) requires a greater degree of safety, accessibility, structural strength, fire protection, means of egress, ventilation or sanitation than is existing in the current building or structure:

1. Any change in the occupancy classification of a building or structure.

2. Any change in the purpose of, or a change in the level of activity within, a building or structure.

3. A change of use.

BCS

Work Area → Occupancy

229

Chapter 10

- **Occupancy Group:** *Classification*
  - Assembly Group A (A-1, A-2, A-3, A-4, A-5)
  - Business Group B (B)
  - Educational Group E (E)
  - Factory Group F (F-1, F-2)
  - High-Hazard Group H (H-1, H-2, H-3, H-4, H-5)
  - Institutional Group I (I-1, I-2, I-3, I-4)
  - Mercantile Group M (M)
  - Residential Group R (R-1, R-2, R-3, R-4)
  - Storage Group S (S-1, S-2)
  - Utility & Miscellaneous Group U (U)

How do you determine the previous use?

BCS

Work Area → Occupancy

230

Chapter 10

- **Change of Occupancy**
  - **Change of Use:** Must comply with 1002-1010.
  - **Change of Classification or Group:** Must comply with 1002-**1011**.
  - **Certificate of Occupancy:** Shall be issued once the requirements for change of use/occupancy have been met.

BCS

Work Area → Occupancy

231

Chapter 10

- **IEBC 1002:** *Special Use & Occupancy*
  - Per IBC if change of use is to one of the following:
    - Special uses outlined in IBC Chapter 4.
    - Incidental uses listed in IBC Table 509.1.
    - Change to Group I-1 or I-2

Covered or Open Malls
High-rise Buildings
Atriums
Underground Buildings
Motor-Vehicle Related
Group I-2
Group I-3
Motion Picture Rooms
Stages & Platforms
Amusement Areas
Aircraft Related
Combustible Storage
Hazardous Materials
H Occupancies
Spray Applications
Drying Rooms
Organic Coatings
Artificial Decorative Vegetation
Groups I-1, R-1, R-2, R-3 & R-4
Hydrogen Fuel Gas Rooms
Ambulatory Care Facilities
Storm Shelters
Play Structures
Hyperbaric Facilities
Combustible Dusts
Medical Gas Systems
Higher-Ed Laboratories

BCS

Work Area → Occupancy

232

Chapter 10

- **IEBC 1002.4:** *Group I-2 Storage*
  - If a sprinklered Group I-2 occupancy…
  - And a room ≤ **250 SF** undergoes a change in occupancy to a storage room…
  - The storage room shall be separated from the remainder of the building by as required by IBC 509.4.2.

BCS

Work Area → Occupancy

233

Chapter 10

- **IEBC 1006:** *Structural*
  - If > gravity loads, must comply with the IBC.
    - *Exception:* **The 5% Rule**
  - If > wind or snow risk category → IBC 1608 and 1609
    - *Exception:* Not required if < 10% of the building area.

BCS

Work Area → Occupancy

234

Chapter 10

- **IEBC 1006:** *Structural*
  - If the change of occupancy results in a higher Risk Category, it must be shown to meet **"Full Seismic"**.
  - If Group S or U changes to another occupancy → **"Reduced Seismic"**
  - *Exception:*
    - Where area < 10% total building area and it is not Risk Category IV.

BCS

Work Area → Occupancy

235

Chapter 10

- **IEBC 1006:** *Structural*
  - **Risk Category IV:**
    - If provides access to a risk category IV facility it must comply with the IBC (wind, snow, seismic) → **"Full Seismic"**

Work Area → Occupancy

BCS

236

Chapter 10

- **IEBC 1007:** *Electrical*
  - If change of occupancy is to one of the following → per NEC

Hazardous locations	Health care facilities, including Group I-2, ambulatory care facilities & outpatient clinics
Commercial garages, repair and storage	Places of assembly
Spray application, dipping and coating processes	Theaters, audience areas of motion picture and television studios, and similar locations
Gasoline dispensing and service stations	Motion picture, television studios and similar
Bulk storage plants	Motion picture projectors.
Aircraft hangars	Agricultural building

Work Area → Occupancy

BCS

237

Chapter 10

- **IEBC 1007:** *Electrical (cont.)*
  - All *unsafe* conditions shall be corrected to comply with NEC
  - The electrical service must be upgraded to meet the NEC
  - Number of electrical outlets per NEC

BCS

Work Area → Occupancy

238

Chapter 10

- **IEBC 1008:** *Mechanical*
  - If the new occupancy is subject to increase mechanical ventilation requirements, the new occupancy must comply with the IMC.
  - New kitchen exhaust systems must comply with the IMC.

BCS

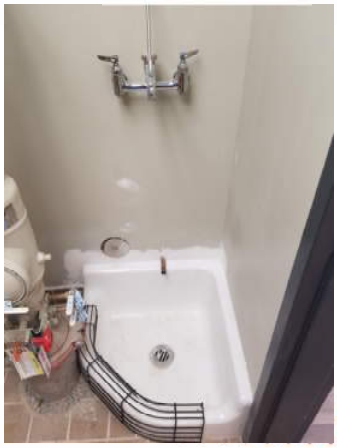
Work Area → Occupancy

239

Amendment

Chapter 10

- **IEBC 1009:** *Plumbing*
  - Per **UPC** if new occupancy requires…
    - Increased plumbing fixtures
    - Different plumbing fixtures
    - Increased water supply
  - *Exception:* Number of plumbing fixtures are not required to comply with **UPC** if occupant load increase **< 20%**



BCS

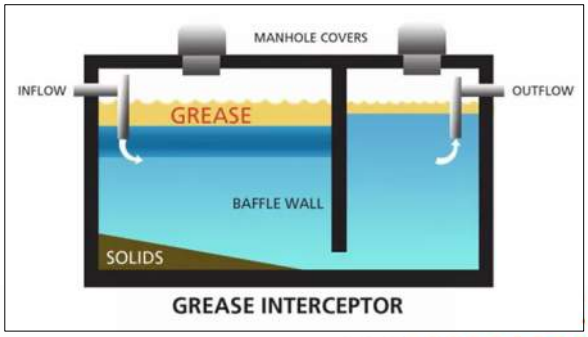
Work Area → Occupancy

240

Amendment

Chapter 10

- **IEBC 1009:** *Plumbing (cont.)*
  - If adding food-handling, existing sanitary waste lines shall be panned or otherwise protected per **UPC**
  - If grease or oil-laden waste is produced → interceptors per **UPC**



Greenway Waste Solutions, https://www.greenwaywastesolutions.com/

BCS

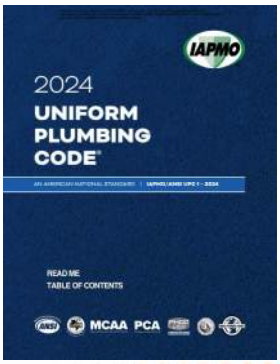
Work Area → Occupancy

241

Amendment

Chapter 10

- **IEBC 1009:** *Plumbing (cont.)*
  - If new occupancy produces chemical waste…
    - Waste must be neutralized, or…
    - Piping must be compatible, and…
    - Must not discharge to public sewer without approval
  - Group I-2 → plumbing system and med gas per **UPC**



International Association of Plumbing and Mechanical Officials, 2024 UPC©

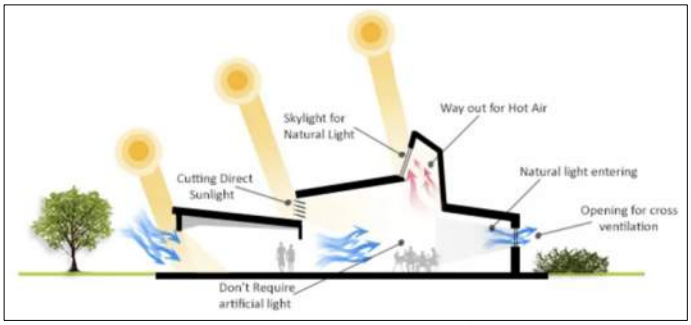
BCS

Work Area → Occupancy

242

Chapter 10

- **IEBC 1010.1:** *Light & Ventilation*
  - Shall comply with the requirements for new construction.



Layak Architecture, https://layakarchitect.com/passive-cooling/

BCS

Work Area → Occupancy

243

Chapter 10

- **IEBC 1002-1010** apply to changes of occupancy within the same use group *(i.e., bowling alley to a dance hall, both are A-3 occupancies)*
- Those requirements and **IEBC 1011** apply to changes in classification *(i.e., A to B, or B to M)* or use group *(i.e., F-1 to F-2, S-2 to S-1).*

BCS

Work Area → Occupancy

244

Chapter 10

- **IEBC 1011.2:** *Fire Protection Systems*
  - Fire sprinklers per IBC **throughout change of occupancy**, as well as **adjacent nonseparated areas**
  - Fire alarms per IBC throughout change of occupancy
    - Connect to existing systems if in existence
    - If no existing systems, ensure new system includes notification devices

BCS

Work Area → Occupancy

245

Chapter 10

- **IEBC 1011.3:** *Interior Finish*
  - Shall comply with the IBC for the new occupancy.
- **IEBC 1011.4:** *Classroom Acoustics*
  - Classrooms < 20,000 ft^3

Work Area → Occupancy

BCS

246

Chapter 10

- **IEBC 1011.5:** *Means of Egress Hazard Category*
  - Higher → Must comply with Chapter 10
  - Equal or Lower → New construction per IBC Chapter 10 and remaining shall comply with Level 3 (IEBC 905)

TABLE 1011.5—MEANS OF EGRESS HAZARD CATEGORIES	
RELATIVE HAZARD	OCCUPANCY CLASSIFICATIONS
1 (Highest Hazard)	H
2	I-2; I-3; I-4
3	A; E; I-1; M; R-1; R-2; R-4, Condition 2
4	B; F-1; R-3; R-4, Condition 1; S-1
5 (Lowest Hazard)	F-2; S-2; U

BCS

247

Chapter 10

- **IEBC 1011.5:** *Means of Egress Hazard Category (cont.)*
  - **Egress capacity** shall meet or exceed occupant load
  - **Handrails** per IEBC 804.13 in work area
  - **Guards** per IEBC 804.12 in work area
  - **EEROs:** If required for new occupancy, operable windows shall have a min. net clear opening of **4.0 SF**, with min net clear height of 22-inches and net clear width of 20-inches.

BCS

Work Area → Occupancy

248

Chapter 10

- **IEBC 1011.6:** *Heights & Area Hazard Category*
  - Higher → Must comply with IBC Chapter 5 & fire barriers for separated occupancies shall comply with IBC Chapter 7
  - Equal or Lower → Existing condition is acceptable

TABLE 1011.6—HEIGHTS AND AREAS HAZARD CATEGORIES	
RELATIVE HAZARD	OCCUPANCY CLASSIFICATIONS
1 (Highest Hazard)	H
2	A-1; A-2; A-3; A-4; I; R-1; R-2; R-4, Condition 2
3	E; F-1; S-1; M
4 (Lowest Hazard)	B; F-2; S-2; A-5; R-3; R-4, Condition 1; U

BCS

Work Area → Occupancy

249

Chapter 10

- **IEBC 1011.6.1.1:** *Fire Wall Alternative*
  - Fire barriers or horizontal assemblies can be used in lieu of fire walls to subdivide into separate buildings.
  - Not allowed for Groups H, F-1 and S-1.
  - Must be fully sprinklered.
  - Max. allowable area shall not consider sprinkler increase.
  - Fire-resistance rating must comply with IBC Table 706.4.

BCS

Work Area → Occupancy

250

Chapter 10

- **IEBC 1011.7:** *Exterior Wall Hazard Category*
  - Higher → Must comply with IBC 705
  - Equal or Lower → Existing condition is acceptable

TABLE 1011.7—EXPOSURE OF EXTERIOR WALLS HAZARD CATEGORIES	
RELATIVE HAZARD	**OCCUPANCY CLASSIFICATION**
1 (Highest Hazard)	H
2	F-1; M; S-1
3	A; B; E; I; R
4 (Lowest Hazard)	F-2; S-2; U

BCS

Work Area → Occupancy

251

Chapter 10

- **IEBC 1011.7:** *Exterior Wall Hazard Category (cont.)*
  - Openings in exterior walls shall be protected as required for new construction.
  - If protected openings are required, the sum of the protected openings shall not > 50% of wall area per story
  - *Multiple exceptions*

BCS

Work Area → Occupancy

252

Chapter 10

- **IEBC 1011.8:** *Enclosure of Vertical Shafts*
  - Stairways → if higher Means of Egress H.C. **interior** stairways shall be enclosed as required for new construction
  - Other vertical shafts → if higher Means of Egress H.C. they shall be enclosed as required for new construction
  - Openings into existing shafts:
    - Shall be protected by 1-hour FR assemblies, and…
    - Have self- or automatic-closing functionality.

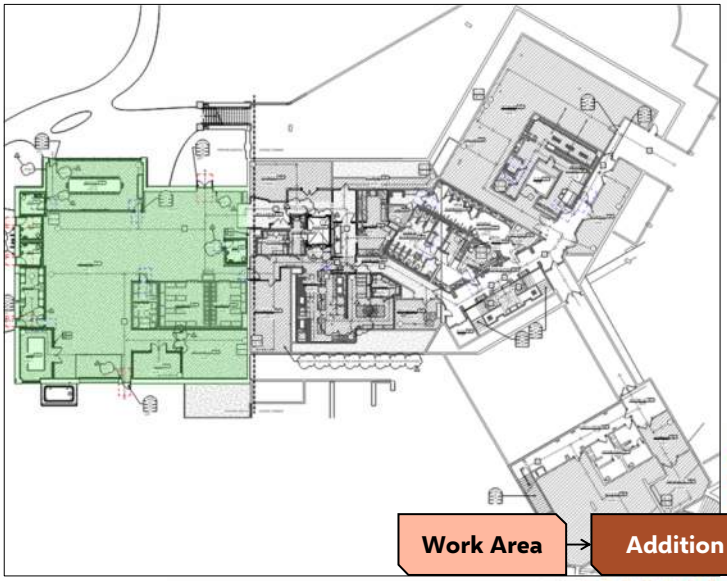
BCS

Work Area → Occupancy

253

Chapter 11

- **Additions**

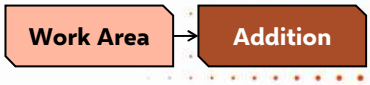


BCS

254

Chapter 11

- **General Items:**
  - Shall not create, or extend, a non-conformity in relation to accessibility, structural strength, fire safety, means of egress, or capacity of MEP systems.
  - Shall not increase the height or allowable area above that allowed by IBC Chapter 5.
  - If addition increases the fire area, existing fire protection systems must comply with IBC Chapter 9.

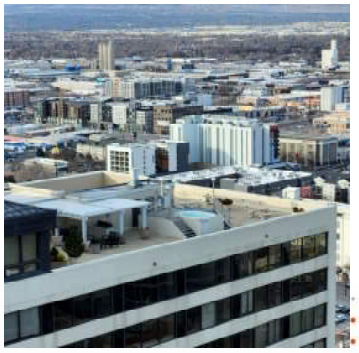


BCS

255

Chapter 11

- **IEBC 1101:** *General Items*
  - Classrooms within the addition shall comply with the enhanced classroom acoustics of ICC A117.1.
  - If a new occupiable roof is added, it shall conform to the requirements outlined in the IBC.



Work Area → Addition

BCS

256

Chapter 11

- **IEBC 1102:** *Heights & Areas*
  - Shall not increase the height or allowable area above that allowed by IBC Chapter 5.
  - If addition increases the fire area, existing fire protection systems must comply with IBC Chapter 9.

Work Area → Addition

BCS

257

Chapter 11

- **IEBC 1103:** *Structural*
  - The addition itself must comply with IBC Chapter 16.
  - All existing structural elements supporting additional gravity loads shall comply with the IBC.
  - All existing structural elements subject to additional snow loads shall comply with the IBC.

Gravity - 5% Rule

BCS

Work Area → Addition

258

Chapter 11

- **IEBC 1103:** *Structural*
  - If lateral rules is triggered…
  - Building + additions musty comply with IBC wind and **"Full Seismic"**.
  - *Exception:* When structurally independent.

Lateral – 10% Rule

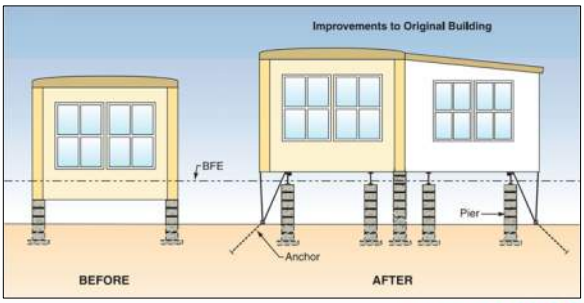
BCS

Work Area → Addition

259

Chapter 11

- **IEBC 1103:** *Structural*
  - **Flood Hazard Areas:**
    - *Interconnected Additions:* New & existing per IBC or IRC if "substantial improvement"
    - *Detached Addition:* Addition only per IBC or IRC
    - New, replaced, raised or extended foundations if "substantial improvement", new & existing shall comply with IBC or IRC



Federal Emergency Management Agency, FEMA P-758 ©

Work Area → Addition

BCS

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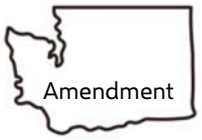
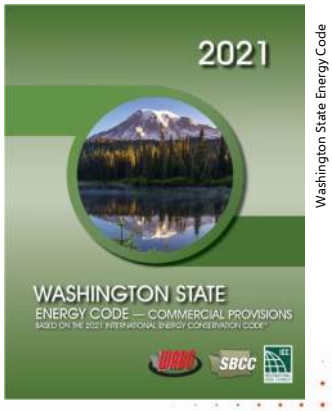


Chapter 11

- **IEBC 1104:** *Energy Conservation*
  - Additions shall conform to the **WSEC** requirements for new construction.



Work Area → Addition

BCS

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Chapter 12

- **Historic Buildings**

Wikimedia Commons, Salt Lake City Temple

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Work Area → Historic

262

Chapter 12

- **IEBC 1201.2:** *Report*
  - If undergoing alteration or change of occupancy an **evaluation report** must be provided.
    - Shall identify each required safety feature that is in compliance, and…
    - Areas where compliance would damage contributing historic features.
    - In SDC 'D-F', should describe complete load path and earthquake-resistant features.
    - Shall demonstrate how the code intent has been complied with to provide equivalent level of safety.
    - Unsafe conditions shall be remedied.

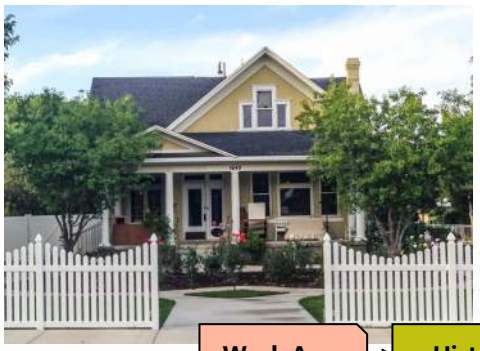
BCS

Work Area → Historic

263

Chapter 12

- **IEBC 1201.3:** *Special Occupancy Exceptions*
  - If Group R-3 and used for Group A, B or M, and…
  - < 3,000ft²
  - Code official can allow Group B for evaluation



Crane House Museum, Riverton, Utah, https://ourjourney.org/campus

Work Area → Historic

BCS

264

Chapter 12

- **IEBC 1201.4:** *Flood Hazard Areas*
  - If within FHA, and…
  - Work constitutes a substantial improvement…
  - Shall comply with IBC 1612 or IRC R322
  - *Exception:* If it will continue to be a historic building.

Work Area → Historic

BCS

265

Chapter 12

- **IEBC 1201.5:** *Unsafe Conditions*
  - "Conditions determined by the code official to be unsafe shall be remedied."
  - "Work shall not be required beyond what is required to remedy the unsafe conditions."

Microsoft 365, PowerPoint, Stock Images

BCS

Work Area → Historic

266

Chapter 12

- **IEBC 1202:** *Repairs*
  - Can use like materials and methods.
  - Hazardous materials shall not be used.
  - Replaced glazing in hazardous locations → per IBC
  - Replacement of missing features shall be allowed.

Wikimedia Commons, The Columbus Center, South Salt Lake, Utah

BCS

Work Area → Historic

267

Chapter 12

- **IEBC 1203:** *Fire Safety*
  - If the building does not conform to the requirements of this code, and poses a distinct fire hazard…
  - Shall be provided with an approved **fire extinguishing system**.
  - Give-Aways:
    - Interior finishes
    - Stairway enclosure
    - 1-hour FR assemblies
    - Glazing in FR assemblies
    - Stairway railings
    - Guards
    - Exit signs

BCS

Work Area → Historic

268

Chapter 12

- **IEBC 1204:** *Change of Occupancy*
  - Building area can exceed IBC Chapter 5 by 20%
  - Higher-hazard category → exterior walls and protected openings → alternates
  - If sprinklered, 1-hour occupancy separations not required
  - Exit stair live load of 75psf
  - Existing natural light may be acceptable

BCS

Work Area → Historic

269

Chapter 12

- **IEBC 1205:** *Structural*
  - Shall comply with IEBC Chapters 4 or 5.
  - *Exceptions:*
    - Code official can approve existing live loads.
    - Substantial Structural Damage → restored to pre-damaged condition
  - Dangerous conditions shall be remedied.

BCS

Work Area → Historic

270

Chapter 12

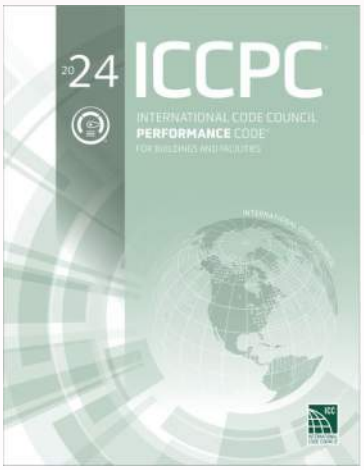
- **IEBC 1206:** *Relocated Buildings*
  - New foundation per IBC.
  - Shall be sited so exterior walls and openings comply with IBC.

Wolfe House Building Movers (https://www.wolfehousebuildingmovers.com/), Weber County Museum

BCS

Work Area → Historic

Part 6. Performance Compliance



BCS

Performance

272

Chapter 13

- **Performance Compliance Method:**
  - Easily the least used.
  - Applies to alterations, additions and changes of use.
  - Cannot be used for Use **Groups H, I-1, I-3, or I-4**.
  - Deals mainly with fire and life-safety issues.
  - Unsafe conditions must be remedied.

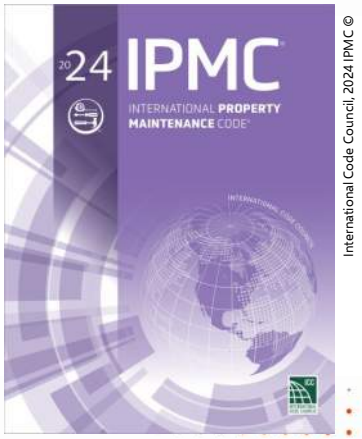
BCS

Performance

273

Chapter 13

- **Performance Compliance Method:**
  - Must also comply with the IFC and IPMC.
  - FHA and work constitutes a "substantial improvement."



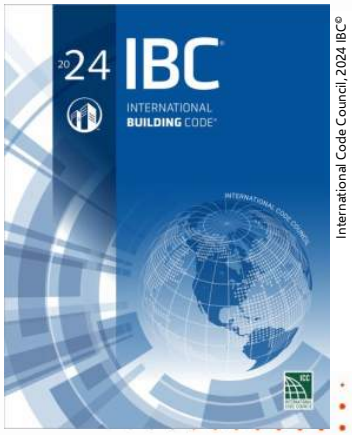
BCS

Performance

274

Chapter 13

- **IEBC 1304.1.1:** *Investigation & Evaluation*
  - **Structural Analysis:**
    - Capable of resisting loads specified in IBC Chapter 16.
    - The results of the investigation and evaluation must be provided to the code official.
    - Code official determines if in compliance.



BCS

Performance

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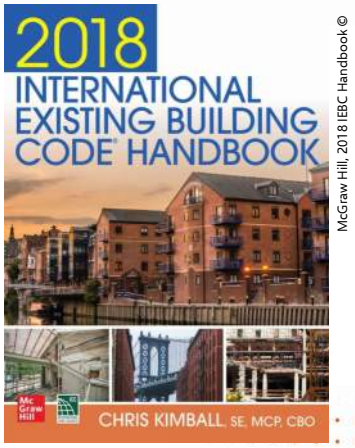
Chapter 13

- **IEBC 1304.1.3:** *Determination*
  - Four key elements:
    - Structural analysis
    - Fire safety evaluation
    - Means of egress evaluation
    - General safety evaluation



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Performance

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Chapter 13

- **IEBC 1305.1:** *Scoring & Evaluations*
  - As part of the evaluation, the design professional is required to determine…
    - **15** separate *Fire Safety* values
    - **22** separate *Means of Egress* values
    - **23** separate *General Safety* values

BCS

Performance

TABLE 1306.1—SUMMARY SHEET—BUILDING CODE

Existing occupancy:_____		Proposed occupancy: _____	
Year building was constructed: _____		Number of stories: _____ Height in feet: _____	
Type of construction: _____		Area per floor: _____	
Percentage of open perimeter increase: _____ %			
Completely suppressed:	Yes _____ No _____	Corridor wall rating:_____	
		Type:_____	
Compartmentation:	Yes _____ No _____	Required door closers:	Yes _____ No _____
Fire-resistance rating of vertical opening enclosures: _____			
Type of HVAC system:_____, serving number of floors: _____			
Automatic fire detection:	Yes _____ No _____	Type and location: _____	
Fire alarm system:	Yes _____ No _____	Type: _____	
Smoke control:	Yes _____ No _____	Type: _____	
Adequate exit routes:	Yes _____ No _____	Dead ends: _____	Yes _____ No _____
Maximum exit access travel distance: _____		Elevator controls:	Yes _____ No _____
Means of egress emergency lighting:	Yes _____ No _____	Mixed occupancies:	Yes _____ No _____
Standpipes:	Yes _____ No _____	Care recipients ability for self-preservation: _____	
Incidental use:	Yes _____ No _____	Care recipients concentration: _____	
Smoke compartmentation less than 22,500 ft² (2092 m²):	Yes _____ No _____	Attendant-to-care recipients ratio: _____	

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Performance

SAFETY PARAMETERS	FIRE SAFETY (FS)	MEANS OF EGRESS (ME)	GENERAL SAFETY (GS)
1305.2.1 Building height			
1305.2.2 Building area			
1305.2.3 Compartmentation			
1305.2.4 Tenant and dwelling unit separations			
1305.2.5 Corridor walls			
1305.2.6 Vertical openings			
1305.2.7 HVAC systems			
1305.2.8 Automatic fire detection			
1305.2.9 Fire alarm system			
1305.2.10 Smoke control	****		
1305.2.11 Means of egress	****		
1305.2.12 Dead ends	****		
1305.2.13 Maximum exit access travel distance	****		
1305.2.14 Elevator control			
1305.2.15 Means of egress emergency lighting	****		
1305.2.16 Mixed occupancies		****	
1305.2.17 Automatic sprinklers		÷2=	
1305.2.18 Standpipes			
1305.2.19 Incidental use			
1305.2.20 Smoke compartmentation			
1305.2.21.1 Care recipients ability for self-preservation[a]	****		
1305.2.21.2 Care recipients concentration[b]	****		
1305.2.21.3 Attendant-to-care recipients ratio[a]	****		
Building score–total value			

Let's do an example

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Performance

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Chapter 13

- **IEBC 1305.2.5:** *Corridor Walls*
  - Walls should be evaluated for fire rating & degree of completeness
  - In relation to IBC 1020
  - Values from Table 1305.2.5

TABLE 1305.2.5—CORRIDOR WALL VALUES

OCCUPANCY	CATEGORIES			
	a	b	c[a]	d[a]
A-1	-10	-4	0	2
A-2	-30	-12	0	2
A-3, F, M, R, S-1	-7	-3	0	2
A-4, B, E, S-2	-5	-2	0	5
I-2	-10	0	1	2

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nce

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Chapter 13

TABLE 1305.2.5—CORRIDOR WALL VALUES

OCCUPANCY	CATEGORIES			
	a	b	c[a]	d[a]
A-1	-10	-4	0	2
A-2	-30	-12	0	2
A-3, F, M, R, S-1	-7	-3	0	2
A-4, B, E, S-2	-5	-2	0	5
I-2	-10	0	1	2

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- **IEBC 1305.2.5.1:** *Corridor Walls*
  - Category 'a': No fire partitions, partitions are incomplete, or doors are not self-closing.
  - Category 'b': < 1-hour fire-resistance rated or not constructed per IBC 708.4.
  - Category 'c': 1- to 2-hour fire-resistance rated with doors conforming to IBC 716 or corridors without FR per IBC 1020.
  - Category 'd': ≥ 2-hour fire-resistance rated with doors conforming to IBC 716.

Assume Group R-1, with 1-hour rated corridors. What number should be used?

BCS

Performance

SAFETY PARAMETERS	FIRE SAFETY (FS)	MEANS OF EGRESS (ME)	GENERAL SAFETY (GS)
1305.2.1 Building height			
1305.2.2 Building area			
1305.2.3 Compartmentation			
1305.2.4 Tenant and dwelling unit separations			
1305.2.5 Corridor walls	0	0	0
1305.2.6 Vertical openings			
1305.2.7 HVAC systems			
1305.2.8 Automatic fire detection			
1305.2.9 Fire alarm system			
1305.2.10 Smoke control	....		
1305.2.11 Means of egress	....		
1305.2.12 Dead ends	....		
1305.2.13 Maximum exit access travel distance	....		
1305.2.14 Elevator control			
1305.2.15 Means of egress emergency lighting	....		
1305.2.16 Mixed occupancies		....	
1305.2.17 Automatic sprinklers		+2 =	
1305.2.18 Standpipes			
1305.2.19 Incidental use			
1305.2.20 Smoke compartmentation			
1305.2.21.1 Care recipients ability for self-preservation[a]	....		
1305.2.21.2 Care recipients concentration[b]	....		
1305.2.21.3 Attendant-to-care recipients ratio[c]	....		
Building score-total value			

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Performance

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Chapter 13

- **IEBC 1306.2:** *Mandatory Safety Scores*
  - The mandatory safety score is subtracted from the building score in Table 1306.2.
    - FS – MFS ≥ 0
    - ME – MME ≥ 0
    - GS – MGS ≥ 0

TABLE 1306.2—MANDATORY SAFETY SCORES[a]—continued

OCCUPANCY	FIRE SAFETY(MFS)	MEANS OF EGRESS (MME)	GENERAL SAFETY (MGS)
A-3	22	33	33
A-4, E	29	40	40
B	30	40	40
F	24	34	34
I-2	19	34	34
M	23	40	40
R	21	38	38
S-1	19	29	29
S-2	29	39	39

Performance

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Example

PERFORMANCE COMPLIANCE METHOD1

TABLE 1301.7
SUMMARY SHEET-BUILDING CODE

Existing occupancy: R1			Proposed occupancy: R2		
Year building was constructed: 1969			Number of stories: 24	Height in feet: 324'-7"	
Type of construction: 1A			Area per floor: 9255 sf (gross)		
Percentage of open perimeter increase: 0 %					
Completely suppressed:	Yes X	No	Corridor wall rating: 1 hour		
			Type:		
Compartmentation:	Yes	No X	Required door closer:	Yes X	No
Fire-resistance rating of vertical opening enclosures: 2 hours					
Type of HVAC system: fan coil units in dwelling units and corridor			serving number of floors: Levels 6 - 24 (all residential)		
Automatic fire detection:	Yes X	No	Type and location: sprinkler water flow		
Fire-alarm system:	Yes X	No	Type:		
Smoke control:	Yes	No X	Type:		
Adequate exit routes:	Yes X	No	Dead ends	Yes X	No
Maximum exit access travel distance: 89 ft			Elevator controls:	Yes X	No
Means of egress emergency lighting:	Yes	No	Mixed occupancies:	Yes	No X
Standpipes:	Yes X	No	Patient ability for self-preservation:		
Incidental use:	Yes	No	Patient concentration:		
Smoke compartmentation less than 22,500 sq.feet (2092m2)	Yes	No	Attendant to patient ratio:		

SAFETY PARAMETERS	FIRE SAFETY (FS)	MEANS OF EGRESS (ME)	GENERAL SAFETY (GS)
1301.6.1 Building height	10	10	10
1301.6.2 Building area	10.5	19	19
1301.6.3 Compartmentation	6.45	6.45	6.45
1301.6.4 Tenant & dwelling unit separations D	2	2	2
1301.6.5 Corridor walls C	0	0	0
1301.6.6 Vertical openings	2.4	2.4	2.4
1301.6.7 HVAC systems	-5	-5	-5
1301.6.8 Automatic fire detection B	-5	-5	-6.5
1301.6.9 Fire alarm system D	5	5	5
1301.6.10 Smoke control	****		
1301.6.11 Mean of egress C	0	0	0
1301.6.12 Dead ends B	0	0	0
1301.6.13 Maximum exit access travel distance: 80'	****	12.8	12.8
1301.6.14 Elevator control C	0	0	0
1301.6.15 Means of egress emergency lighting	****	4	4
1301.6.16 Mixed occupancies B	0	0	0
1301.6.17 Automatic sprinklers E	4	/3 = 2	4
1301.6.18 Standpipes A	-6	-6	-6
1301.6.19 Incidental use	0	0	0
1301.6.20 Smoke compartmentation	0	0	0
a. 1301.4.21.1 Patient ability for self-preservation	****		
a. 1301.4.21.2 Patient concentration	****		
a. 1301.4.21.3 Attendant-to-patient ratio	****		
Building score-totAll-IBBal value	24.35	47.65	49.65

*** No applicable value to be inserted

Performance

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Existing occupancy: R1			Proposed occupancy: R2		
Year building was constructed: 1969			Number of stories: 24	Height in feet: 324'-7"	
Type of construction: 1A ← *Can this be confirmed?*			Area per floor: 9255 sf (gross)		
Percentage of open perimeter increase: 0 %					
Completely suppressed:	Yes X	No	Corridor wall rating: 1 hour		
			Type:		
Compartmentation:	Yes	No X	Required door closer:	Yes X	No
Fire-resistance rating of vertical opening enclosures: 2 hours					
Type of HVAC system: fan coil units in dwelling units and corridor			serving number of floors: Levels 6 - 24 (all residential)		
Automatic fire detection:	Yes X	No	Type and location: sprinkler water flow		
Fire-alarm system:	Yes X	No	Type:		
Smoke control:	Yes	No X	Type:		
Adequate exit routes:	Yes X	No	Dead ends	Yes X	No
Maximum exit access travel distance: 89 ft			Elevator controls:	Yes X	No
Means of egress emergency lighting:	Yes	No	Mixed occupancies:	Yes	No X
Standpipes:	Yes X	No	Patient ability for self-preservation:		
Incidental use:	Yes	No	Patient concentration:		
Smoke compartmentation less than 22,500 sq.feet (2092m2)	Yes	No	Attendant to patient ratio:		

Performance

There is no compart-mentation

Alarm, voice evac & fire command center?

SAFETY PARAMETERS	FIRE SAFETY (FS)	MEANS OF EGRESS (ME)	GENERAL SAFETY (GS)
1301.6.1 Building height	10	10	10
1301.6.2 Building area	10.5	~~19~~	~~19~~
1301.6.3 Compartmentation	~~0.45~~	~~0.45~~	~~0.45~~
1301.6.4 Tenant & dwelling unit separations D	2	2	2
1301.6.5 Corridor walls C	0	0	0
1301.6.6 Vertical openings	2.4	2.4	2.4
1301.6.7 HVAC systems	-5	-5	-5
1301.6.8 Automatic fire detection B	-5	-5	-6 -5
1301.6.9 Fire alarm system D	5	5	5
1301.6.10 Smoke control	****		
1301.6.11 Mean of egress C	0	0	0
1301.6.12 Dead ends B	0	0	0
1301.6.13 Maximum exit access travel distance: 90'	****	12.8	12.8
1301.6.14 Elevator control C	0	0	0
1301.6.15 Means of egress emergency lighting	****	4	4
1301.6.16 Mixed occupancies B	0	0	0
1301.6.17 Automatic sprinklers E	4	/2 = 2	4
1301.6.18 Standpipes A	-6	-6	-6
1301.6.19 Incidental use	0	0	0
1301.6.20 Smoke compartmentation	0	0	0

Max. value is 10.5

Assumes 1-hour fire partitions

Performance

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Adjusted for compartmentation & building area

24.35	47.65	49.65
17.9	32.7	34.7

TABLE 1306.2—MANDATORY SAFETY SCORES[a]—continued

OCCUPANCY	FIRE SAFETY(MFS)	MEANS OF EGRESS (MME)	GENERAL SAFETY (MGS)
A-3	22	33	33
A-4, E	29	40	40
B	30	40	40
F	24	34	34
I-2	19	34	34
M	23	40	40
R	21	38	38
S-1	19	29	29
S-2	29	39	39

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Part 7. Moved Buildings

Panel Built Incorporated, https://www.panelbuilt.com

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Relocated

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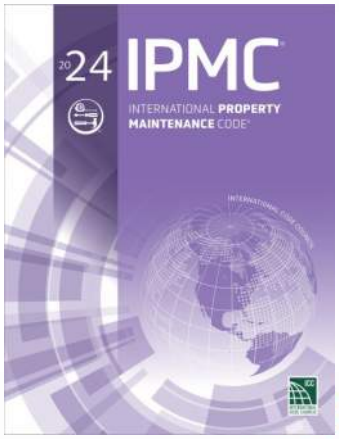
Chapter 14

- **IEBC 1401:** *General*
  - Relocated or moved structures, including **relocatable buildings**.
  - Shall be safe for human occupancy as per IFC & IPMC
  - Field fabricated elements per IBC or IRC
  - Repairs, alterations, additions or changes of occupancy requirements must be met



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Relocated

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Chapter 14

- **IEBC 1402:** *Requirements*
  - Located on lot per IBC or IRC.
  - Foundation system & connection per IBC or IRC.
  - Wind loads per IBC or IRC.
  - Seismic loads per IBC or IRC.
  - Snow loads per IBC or IRC.

  5% Gravity & 10% Lateral Rules apply
  - FHA → shall comply with IBC or IRC.
  - Inspections → required repairs as part of inspection shall be made prior to final approval.

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Relocated

Part 8. Examples

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Test Your Knowledge!

- What are some benefits of using the IEBC in lieu of the IBC?
- How many compliance methods are there?
- Which compliance methods address change of occupancy?
- Which compliance methods address repairs?
- What is required to show compliance with the performance method?
- What compliance method would you use for an office T.I. in a large strip mall?

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Test Your Knowledge!

- What level of alteration requires URM parapets to be braced?
- What is an example of a special inspection that may be required for existing buildings?
- What compliance method would you use for an alteration to a relatively new building?
- What is required for a historic building?
- What is required for a relocatable building?

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Test Your Knowledge!

- What is the "gravity" rule of thumb?
- When do parapets need to be braced?
- Do only URM's require roof-to-wall connections to be evaluated?
- What is the "lateral" rule of thumb?
- Is it located in a FHA? If so, what should you be worried about?

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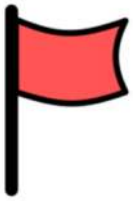
Examples



- **Are your antennas ready?**
  - Chapter 3 applies to all
  - Repairs must comply with Chapter 4
  - Relocated building must comply with Chapter 14
  - Remember Prescriptive & Work Area Methods apply to…
    - Alterations
    - Additions
    - Changes of Use
    - Historic Buildings

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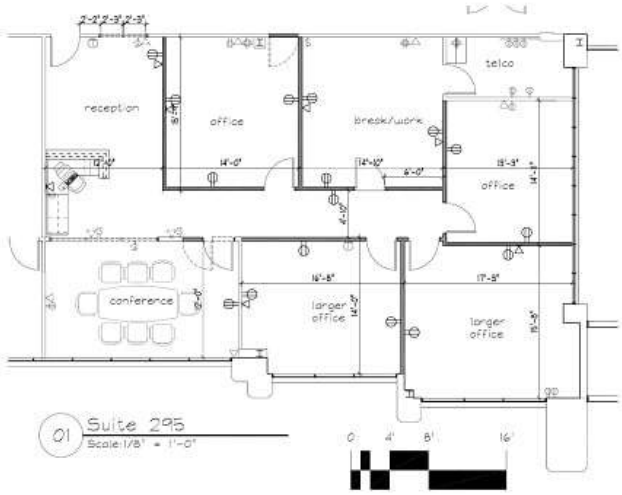
Example #1
Office T.I.



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Example #2
Residential to Office

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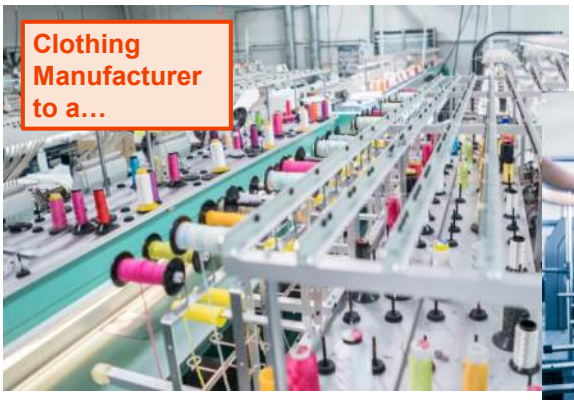
Example #3
Group F-1 to F-2



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Example #4
Warehouse to Church

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Example #5
Office Addition

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Example #6
School Relocatable

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Example #7
K-Mart to VASA

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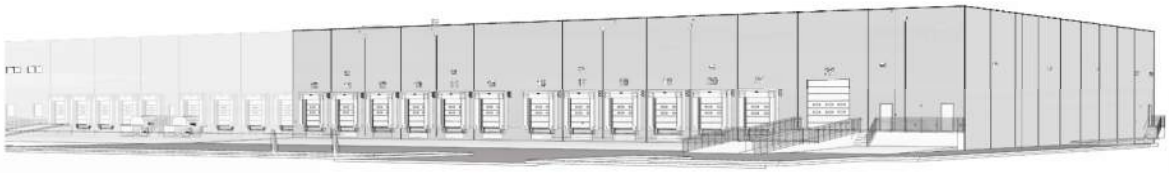
Example #8
Addition



PROJECT NARRATIVE:

THIS PERMIT IS FOR A 51,271 SF ADDITION TO THE EXISTING WAREHOUSE LOCATED AT
THIS ADDITION CONSISTS OF A CHILLED WAREHOUSE (36-40f), AND FROZEN WAREHOUSE (0F). THIS PERMIT ALSO ENTAILS CONSTRUCTING THE SHELL SPACE FOR 9 BANANA RIPENING ROOMS, THE ROOMS WILL BE BY SEPARARATE PERMIT AND WILL COMPLY WITH ALL CODES RELATING TO ETHYLENE RIPENING SYSTEMS.
THE SPACE WILL BE FULLY SPRINKLED, AND IS TYPE IIB CONSTRUCTION, WITH CLASS 3 STORAGE.

THE WAREHOUSE ENVELOPE WILL BE CONSTRUCTED OF AN EXTERIOR CONC TILT PANEL WITH A MIN 4" IMP LINER PANEL. THE ROOF STRUCTURE WILL BE STEEL JOIST AND DECK THROUGHOUT THE CHILLED WAREHOUSE, AND WIDE FLANGE JOIST AND DECK THROUGHOUT THE BANANA RIPENING ROOM SPACE.

ALL WAREHOUSE RACKING AND FIRE ALARM WILL BE BY SEPARATE PERMIT. FIRE SUPPRESSION AND STEEL JOIST AND DECK WILL BE BY DEFERRED SUBMITTAL.

THE EXISTING FACILITY HAS ONE EXTRA PLUMBING FIXTURE PER MALE AND FEMALE FACILITIES. WE ARE ADDING ONE ALL GENDER TOILET IN THE OFFICE OF THE NEW WAREHOUSE, AND ASK THAT THE ADDITIONAL FACILITY IN THE EXISTING SPACE SERVE AS THE ADDITIONAL FIXTURE NECCESARY PER CODE.

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Thank You!
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