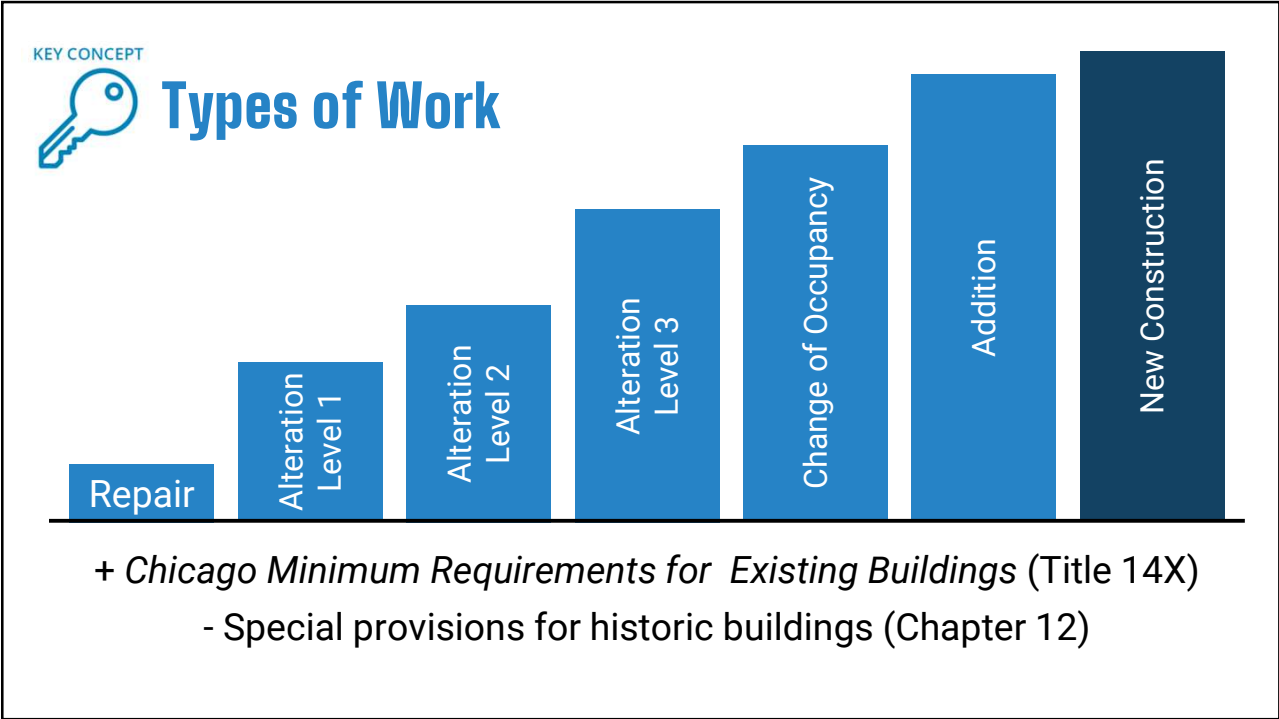




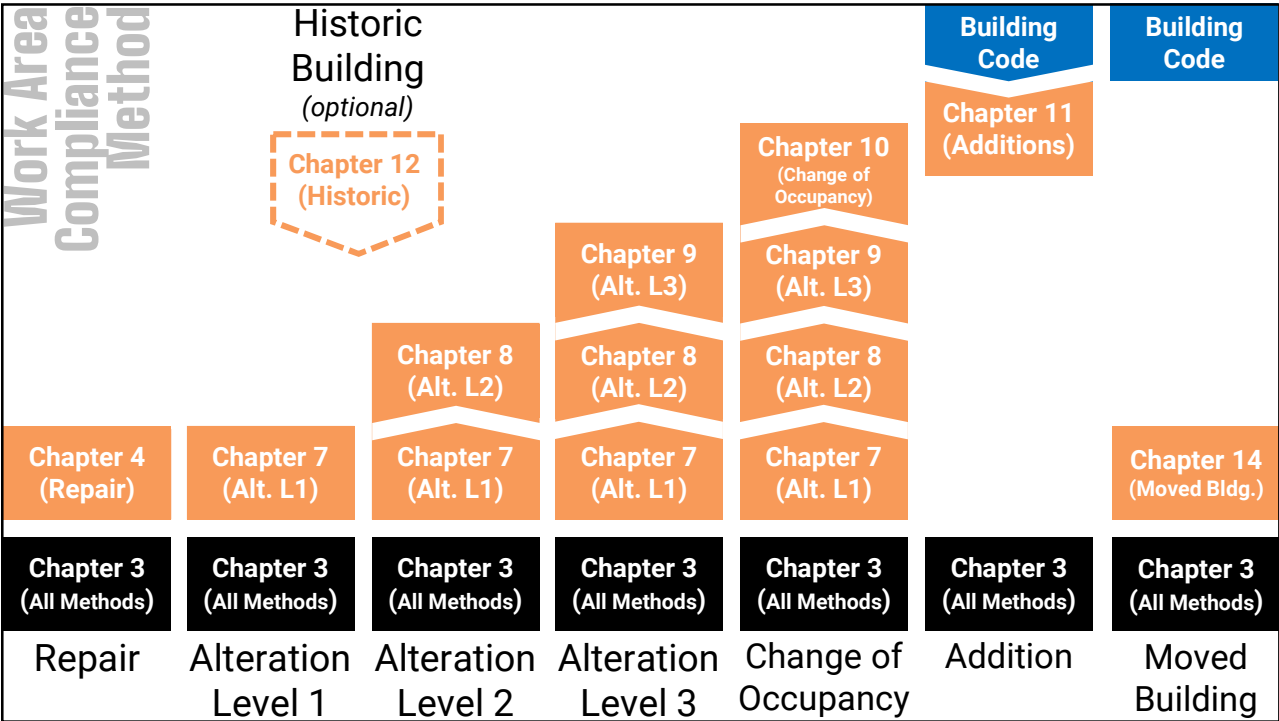
373



374



375



376

KEY CONCEPT



## Repair

**REPAIR.** The reconstruction, replacement or renewal of any part of an *existing building* for the purpose of its maintenance or to correct damage.

- Some “repairs” may be classified as “alterations” for purposes of accessibility compliance, including plumbing fixture replacement (See definition of “Alteration (for Section 305)”)

377

KEY CONCEPT



## Alteration

**ALTERATION.** Any construction or renovation to an *existing structure* other than a *repair* or *addition*.



Photo courtesy Hutter Architects Ltd.

378

KEY CONCEPT



## Addition

**ADDITION.** An extension or increase in floor area, number of stories, or *building height* of an *existing building*.

- Not necessarily change in building envelope
- Could be adding floor area within envelope (mezzanine, infill floor, etc.)



379

KEY CONCEPT



## Alteration—Level 1

Level 1 *alterations* include the removal and replacement or the covering of existing materials, elements, equipment, or fixtures using new materials, elements, equipment, or fixtures that serve the same purpose.

(602.1)

- No reconfiguration of space or building features/systems
- No new building features/systems

380

FOR EXAMPLE



## Alteration—Level 1 Examples

- Replacement finish flooring or installing new finish flooring over existing floor surface
- Installation of decorative paneling on existing walls
- Installation of new exterior siding
- Window or door replacement (in existing openings)
- Replacement of existing mechanical, electrical, or plumbing fixtures with more efficient models
- Roof recover or roof replacement
- Drop ceiling (as long as min. ceiling height maintained)

381

KEY CONCEPT



## Alteration—Level 2

Level 2 *alterations* include the reconfiguration of space, the addition or elimination of any door or window, the reconfiguration or extension of any system, or the installation of any additional equipment. (603.1)

382

FOR EXAMPLE



## Alteration—Level 2 Examples

- 1) Reconfiguration of space  
New or relocated walls, means of egress, natural light
- 2) Addition or elimination of any door or window  
(self-explanatory)
- 3) Reconfiguration or extension of any system  
New or relocated plumbing, ductwork, electrical
- 4) Installation of any additional equipment  
Adding air conditioning (no AC before)

383

KEY CONCEPT



## Work Area

**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.

384

## Work Area (continued)

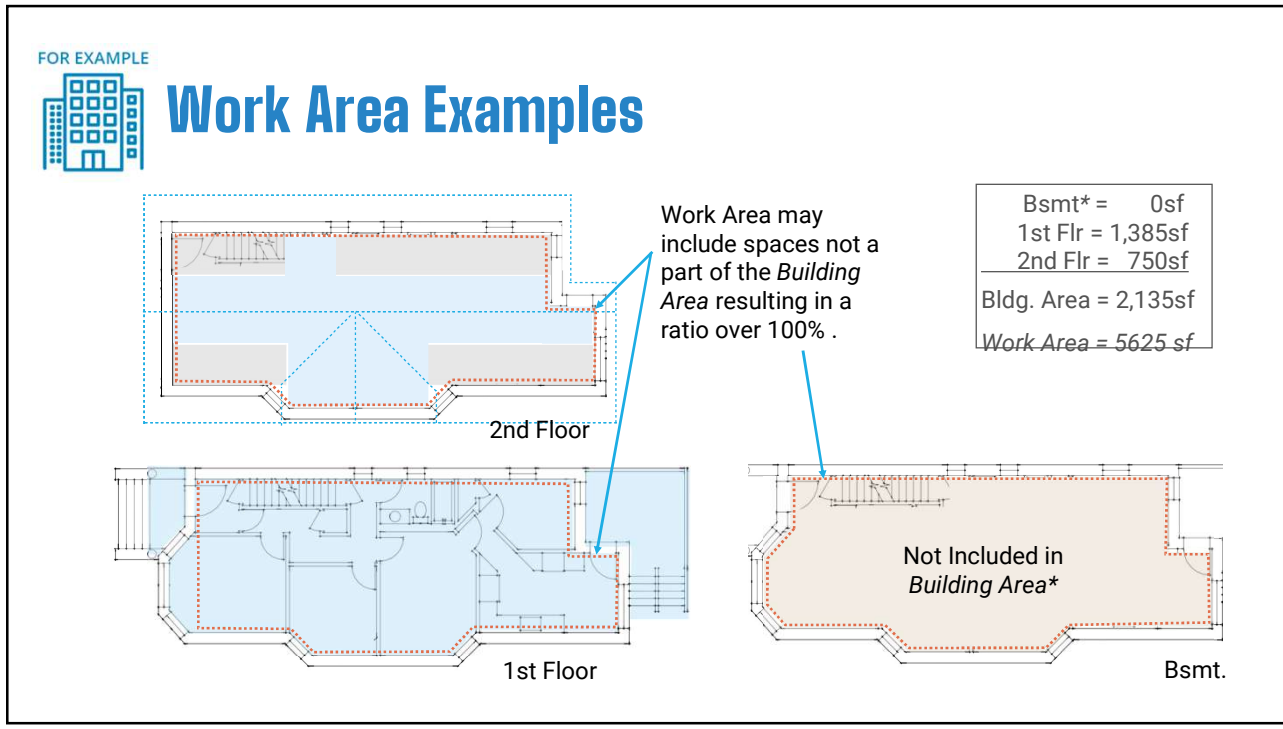
**WORK AREA.** That portion or portions of a building consisting of all **reconfigured spaces** as indicated on the construction documents. Work area excludes other portions of the building where **incidental work** entailed by the intended work must be performed and portions of the building where **work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

385

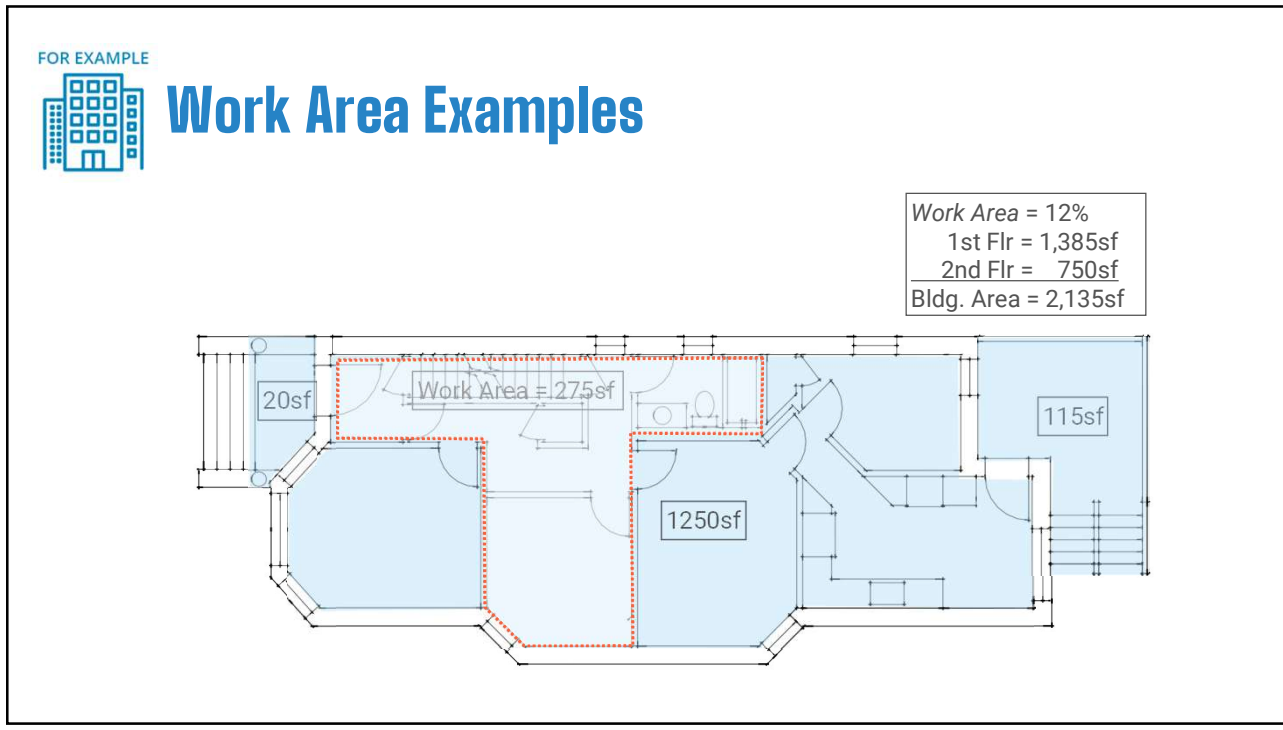
## Work Area (continued)

- Work area ≠ Level 2 alterations  
Installation of AC throughout building (previously no AC) is Level 2 alteration, but only *reconfigured space* = work area
- Incidental work  
Areas disturbed to run new electrical conduit for new lighting or ductwork for new HVAC ≠ work area
- Code-mandated work  
Areas disturbed to install code-required sprinkler system ≠ work area

386



387



388



**FOR EXAMPLE** **Work Area**

- Convert file room to 3 private offices
- Work area is floor area of old file room

389

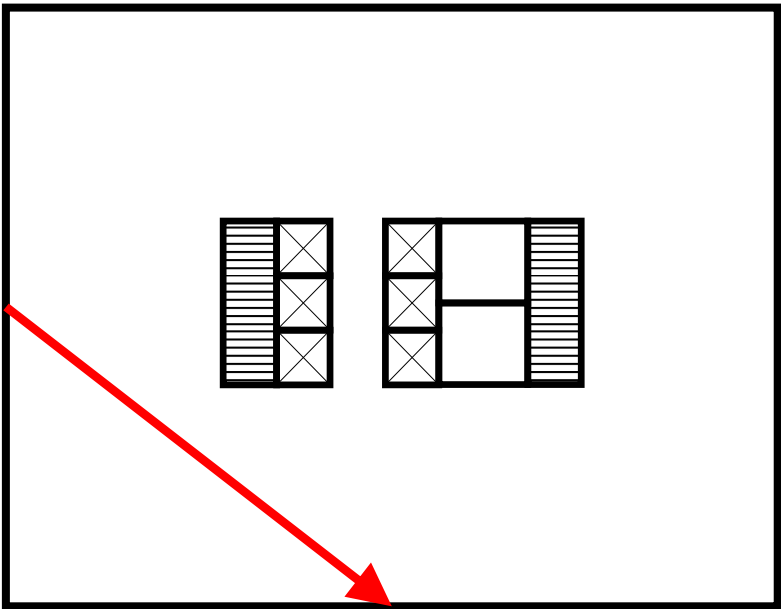
**FOR EXAMPLE** **Work Area**

- Combine 2 office suites
- No change in egress/layout for either suite
- Work area is area of wall that is removed (almost zero)

390

**FOR EXAMPLE** **Work Area**


- Reconfigure lobby-level exit locations
- Work area is entire story
- But not stories above, as it does not change travel distances, etc.



The diagram shows a floor plan with a red arrow pointing to a specific area. The floor plan consists of two main sections. The left section is a vertical strip with a grid of small squares, representing a lobby or exit area. The right section is a larger area with a grid of small squares, representing the main work area. A red arrow points from the left section towards the right section, indicating the work area.

391

**KEY CONCEPT**

 **Alteration—Level 3**

Level 3 *alterations* apply where the *work area* exceeds 50 percent of the *building area* during any consecutive 36-month period. (603.1)

- Requires checking recent permit activity
- Because *building area* generally excludes *basements*, work area can exceed 100% of building area

392



## Change of Occupancy

**CHANGE OF OCCUPANCY.** A change in the use of a *building* or a portion of a *building* that results in any of the following:

1. A change of classification to a different major occupancy group (for example, from Group A-2 to Group B).
2. A change of classification from one group to another group within a major occupancy group (for example, from Group A-2 to Group A-3).

...

393



## Change of Occupancy (continued)

...

3. A change of classification from one condition to another condition within an occupancy group (for example, from Group I-2, Condition 1 to Group I-2, Condition 2).

A change of use that does not result in a change of occupancy classification (for example, from a restaurant to a tavern, which are both classified as Group A-2 occupancies) is not a *change of occupancy*.

394

FOR EXAMPLE



## Change of Occupancy Examples

- Adaptive reuse of former elementary school building for small business incubator
- Restaurant moving into retail space previously used as cell phone store
- Operating real estate office out of building originally built as single-family home (no alterations)
- Converting upper floors of department store to business offices.



**Remember:** The new use and occupancy must also be allowed by the zoning classification of the property.

395

KEY CONCEPT

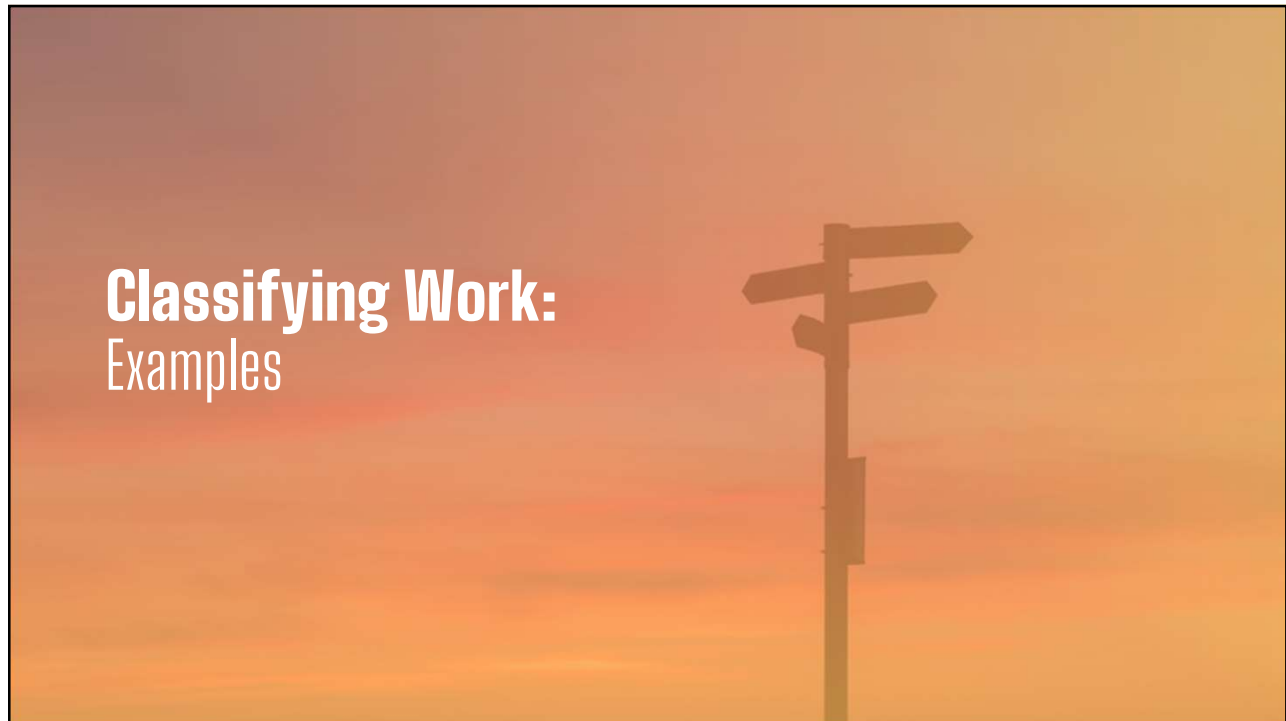


## Relocated or Moved Buildings

- Applies to any building that is relocated, either on same lot or from one lot to another
- If scope includes other types of rehabilitation work, must comply with one of the compliance options



396



397

## Classification

- Do existing conditions comply with *Minimum Requirements*?
  - If no, noncompliance must be addressed as part of work.
- Is only work being done for maintenance of existing features/conditions or to address damage to existing features/conditions?
  - Classify as **repairs**. Minimal requirements to upgrade.

398

## Classification: Change of Occupancy

- Is there a change of occupancy?
  - Must show compliance with Chs. 3, 7, 8, 9 and 10, even if no alterations planned.
  - Different major occupancy group
  - Different group within major occupancy group
  - One condition to another
  - Does **NOT** include creation of accessory occupancy

399

## Classification: Reconfiguration

- Is there reconfiguration of space?
  - Must further distinguish between Levels 1\*, 2, 2+ and 3
  - Adding, removing, rearranging walls, partitions, means of egress components?
  - Lowering existing ceiling below code-required clearance?
  - Creating additional floor area by raising ceiling height or inserting new floor structure?
  - Adding removing, rearranging natural light/vent openings
  - Changing non-occupiable space to occupiable space

400

## Classification: Reconfiguration (continued)

- Reconfiguration exclusively to increase accessibility
  - Level 1
- Work area is less than 50% of floor area on each story where work is occurring
  - Level 2
- Work area is more than 50% of floor area on any story where work is occurring, and less than 50% of building area
  - Level 2+
- Work area of all projects exceeds 50% of building area (36 months)
  - Level 3

401

## Classification: Level 2


- Addition or elimination of a window not required for natural light/ventilation
- Reconfiguration or extension of any system
- Installation of additional equipment
- Removal and replacement or covering of existing materials, elements, equipment or fixtures with new materials, elements, equipment or fixtures
  - that serve the same purpose
  - for a reason other than maintenance or to correct damage

402




403

KEY CONCEPT



## Alterations

- **Work cannot make building less compliant** (701.2)
  - Cannot reduce (active or passive) fire protection. (703.1)
  - Cannot reduce compliance of means of egress with new construction requirements. (704.1)
- **New work and materials** must comply with *Chicago Construction Codes* for new construction. (702.6)



404



## Alterations—Level 1 Requirements

- Work areas that involve removal and replacement or the covering of existing materials, elements, equipment or fixtures using new materials, elements, equipment or fixtures that serve the same purpose.
- Requirements in Chapter 7

Chapter 3  
(All)

+

Chapter 7  
(Level 1)

405

KEY CONCEPT



## Alterations—Level 1 (continued)

- Only involves replacement of components
- Does not include reconfiguration of rooms or spaces
- No area limitations
- Alterations, typically, must comply with new construction requirements of CBC

406

FOR EXAMPLE



## Alteration—Level 1 Examples

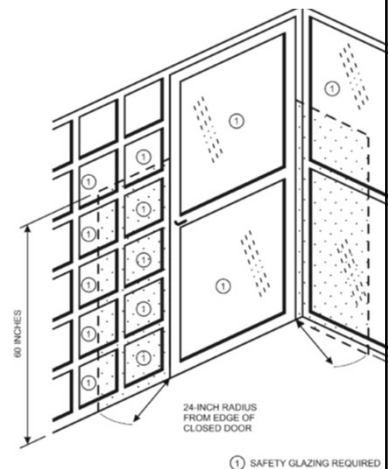
- Replacement finish flooring or installing new finish flooring over existing floor surface
- Installation of decorative paneling on existing walls
- Installation of new exterior siding
- Window or door replacement (in existing openings)
- Replacement of existing mechanical, electrical, or plumbing fixtures with more efficient models
- Roof recover or roof replacement
- Drop ceiling (as long as min. ceiling height maintained)

407

## Alterations—Level 1 Replacement Glazing

Replacement glazing in hazardous locations – must comply with CBC Section 2406

- Doors and sidelights
- Guards and Railings
- Rooms or areas with wet surfaces
- Adjacent to stairs

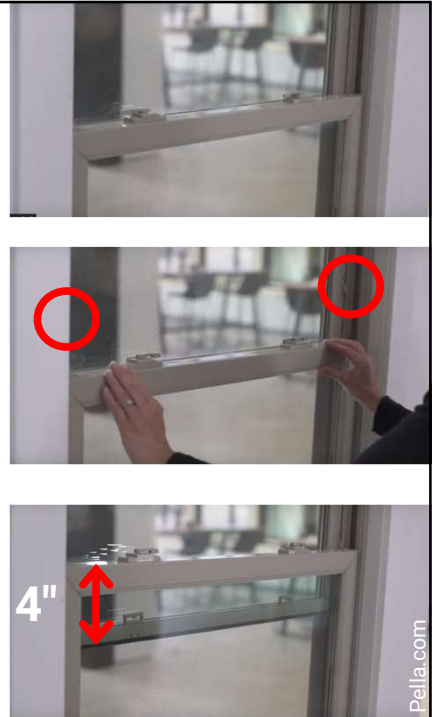


For more information, see  
*Chicago Plan Review Manual*  
Volume II, Task 6.4

408

## Alterations—Level 1 Replacement Windows

- Replacement windows (sash and glazing) in Group R must have opening control devices or fall prevention device (ASTM F2090) where: (702.4)
  - Sill is less than 36" AFF in Groups R-1, R-2, R-3, R-4
  - Sill is less than 24" AFF in Group R-5 or townhouse



409

## Alterations—Level 1 Structural

- If alteration increases design dead, live, or snow load **>5%**, graving load-carrying structure must be upgraded to new construction requirements, except:
  - Group R-5 that complies with conventional light frame construction requirements
  - Where increased dead load is due entirely to the addition of a second layer of roof covering over existing single layer of roof covering
- Additional requirements for reroofing Risk Category IV

410

KEY CONCEPT



## Alterations—Level 1 Energy Conservation Code

- Entire building not required to comply with IECC only new/rebuilt elements
  - Replacement windows
  - Replacement HVAC/water heating equipment
  - Replacement light fixtures
  - Insulate open wall/roof cavities



411

## Alterations—Level 2



412

KEY CONCEPT



## Alterations—Level 2 Requirements

- Comply with Level 1 (Ch. 7) and Level 2 (Ch. 8) requirements (proportional approach) (801.1)
- Reconfiguration work that is solely to provide accessible route to primary function area only need comply with Ch. 7. (801.1, Ex.)

Chapter 3  
(All)

+

Chapter 7  
(Level 1)

+

Chapter 8  
(Level 2)

413

## Alterations—Level 2 Scope

- Level 2 alterations involve:
  - (a) reconfiguration of space,
  - (b) addition or elimination of door or window,
  - (c) reconfiguration or extension of system, or
  - (d) installation of additional equipment
- The aggregate area of *work areas* (reconfigured space) must be less than 50% of the overall *building area*.

414

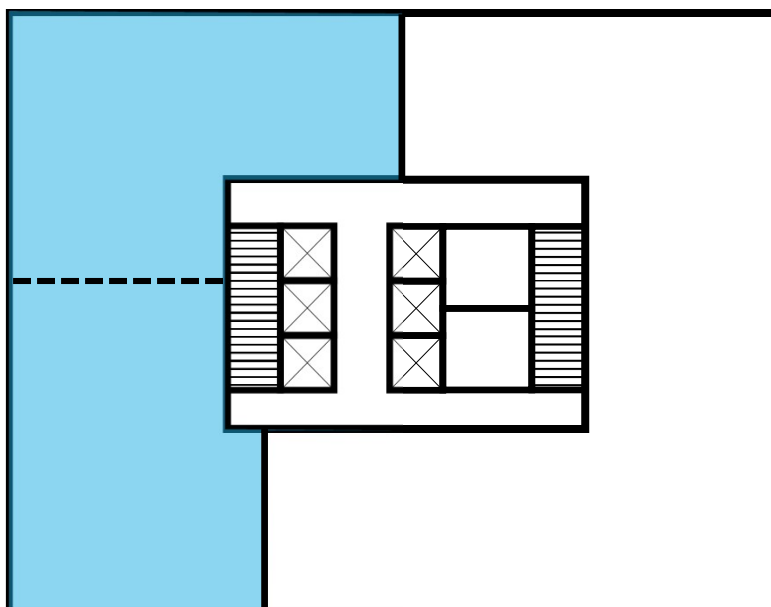
## Alterations—Level 2 Triggers

- Some provisions only apply when work area includes multiple tenant spaces
- Some provisions apply to entire story when work area exceeds 50% of gross floor area of story
  - Exception for occupied tenant spaces entirely outside work area
- For Level 3 alterations and change of occupancy, some of these limitations are not applicable.

415

## Alterations—Level 2 Triggers

If work area is less than or equal to 50% of gross floor area of the story, no requirements outside work area.

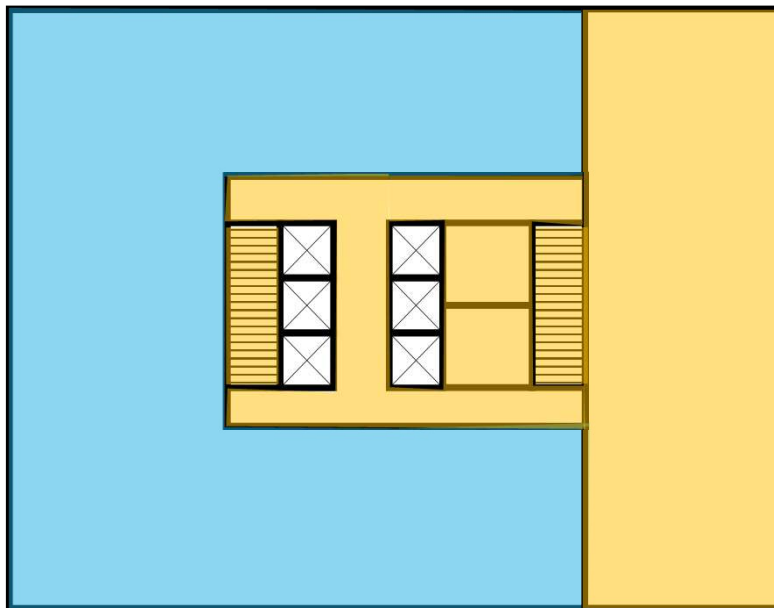


416

## Alterations—Level 2 Triggers

If work area **exceeds** 50% of floor area of the story, triggers requirements outside work area.

- Common areas
- Vertical exits
- Unoccupied tenant spaces



417

FOR EXAMPLE



## Alterations—Level 2 Examples

- 1) Reconfiguration of space  
New or relocated walls/partitions, means of egress, natural light, change of non-occupiable closet to occupiable space
- 2) Addition or elimination of any door or window  
(self-explanatory)
- 3) Reconfiguration or extension of any system  
New or relocated plumbing, ductwork, electrical
- 4) Installation of any additional equipment  
Adding air conditioning (no AC before)

418

KEY CONCEPT



## Alterations—Level 2 New Work

New work must comply with the CBC, except:

- Where windows are added, not required to meet light and ventilation
- New electrical equipment to comply with Section 807
- Length of dead end corridors only required to meet Sec. 805.7
- Ceiling height of newly-created habitable areas and corridors can be 7'-0"
- New structural members and connections may comply with Sect. 302

(801.3)

419

## Alterations—Level 2 Evaluate/Upgrade Existing Conditions

The following must be evaluated and addressed if deficient:

- Existing vertical openings / stairway openings
- Existing fire-resistance ratings / fire separations
- Existing guards and handrails
- Existing interior finishes

If new features must be added to comply, the new elements must comply with new construction requirements unless specific exception applies.

420



## Alterations—Level 2 Automatic Sprinkler System

Three triggers for automatic sprinkler system in Level 2 alterations:

- High-rise buildings (803.2.1)
- Windowless stories (803.2.3)
- Occupancy would require sprinklers under CBC\* (803.2.2)

Must be supervised if required by CBC. (803.2.4)



**Remember:** Sprinkler requirements in *Chicago Minimum Requirements for Existing Buildings*



421

KEY CONCEPT



## Alterations—Level 2 Automatic Sprinkler System (continued)

### Exceptions to Occupancy-based Sprinkler Requirement

- The building does not have adequate water supply available without the installation of a fire pump or new water service
- Group R-2 occupancies (not congregate living) with no more than 4 stories above grade and no more than 20 dwelling units
- If an automatic fire suppression system cannot be installed, the *work area* must be provided with a complete automatic smoke detection system throughout all occupiable spaces except for sleeping units or individual dwelling units

422

## Alterations—Level 2

### Evaluate/Upgrade Existing Conditions

The following must be evaluated and addressed if deficient:

- Existing means of egress configuration (number, size, remoteness)
- Existing means of egress operation (door swing, self-closing)
- Existing standpipe system (buildings over 50')
- Existing fire alarm system (tied to *Minimum Requirements*)

If new elements must be added to comply, the new elements must comply with new construction requirements unless specific exception applies.

423

## Alterations—Level 2

### Smoke Alarms

Smoke alarms are required in *work areas* in group R occupancies and I-1 care/assisted living facilities in:

- Individual sleeping areas
- Individual dwelling units
- Smoke alarms must be installed in accordance with *Chicago Minimum Requirements for Existing Buildings*
- Interconnection of smoke alarms within living units is required
- Smoke alarms outside of work areas do not require interconnection

424

## Alterations—Level 2 Carbon Monoxide Alarms

- When a Level 2 alteration is made a building which is required to have carbon monoxide alarms by the *Chicago Minimum Requirements for Existing Buildings* (Section 504.9), the entire existing building must be provided with carbon monoxide alarms in accordance with that section as part of the permitted work. (804.1)
- **Exceptions:** Exterior work only or MEP work (not involving fuel-burning equipment) only



Phonlamai Photo / shutterstock.com

425

## Alterations—Level 2 Structural

- Where an alteration causes an increase in design dead, live or snow load > 5%, the gravity load-carrying elements must be replaced or altered to meet new construction requirements. (Exception for second layer of roof covering) (806.2)
- For lateral loads, less than 10% increase in demand-capacity ratio. (806.3)
- If an existing gravity load-carrying element has its capacity reduced as part of an alteration (notching a beam) the reduced capacity must meet new construction requirements. (806.2)

426

## Alterations—Level 2 Electrical

- New electrical equipment and wiring must comply with the applicable requirements of the *Chicago Electrical Code*. (807.1)
- Existing wiring in Group A-1, A-5, H, and I occupancies must be upgraded to comply with new construction requirements. (807.2, 308.1)
- *Work areas in dwelling units* in Group R-2, R-3, R-4 and R-5 occupancies must be upgraded to meet minimum requirements in Art. 570 of the *Chicago Electrical Code* and:



427

## Alterations—Level 2 Electrical (continued)

- Every enclosed area, other than closets, kitchens, unfinished basements, garages, hallways, laundry areas, utility areas, storage areas, toilet rooms and bathrooms must have:
  - 2 duplex receptacle outlets
  - 1 duplex receptacle outlet and 1 ceiling- or wall-type lighting outlet (807.3.1)
  - Kitchens must have no fewer that 2 duplex receptacle outlets (807.3.2)
  - Laundry areas must have no fewer than 1 duplex receptacle outlet (807.3.3)
  - Newly installed receptacle outlets shall be GFCI per the CEC (807.3.4)
- At least 1 lighting outlet is required in every unfinished basement, utility room, bathroom, hallway, stairway, attached garage and detached garage with electric power and at outdoor entrances and exits (807.3.5, 807.3.6)
- Clearance for electrical equipment must be per the CEC (807.3.7)

428

## Alterations—Level 2 Mechanical

- Spaces that are reconfigured into habitable or occupiable spaces must be provided with natural and/or mechanical ventilation in accordance with the *Chicago Construction Codes*. (808.1)
- Existing and reconfigured mechanical ventilation systems must provide at least 5 cfm/person outdoor air and at least 15 cfm/person. (808.2)
- New sources of irritating odors, fumes or vapors must be provided with local exhaust (808.3)



429

## Alterations—Level 2 Plumbing

Where the occupant load of a story is increased by > 20% as a result of a Level 2 alteration:

- Additional plumbing fixtures (for that story only) must be provided as required by the *Chicago Plumbing Code* based on the increased occupant load. (809.1)
- (or ACAR)



430

KEY CONCEPT



## Alterations—Level 2 Energy Conservation

- Level 2 alterations do not require the entire building to comply with the energy requirements of the *Chicago Energy Conservation Code (CECC)*. (810.1)
- Work associated with the Level 2 alteration project must comply with the CECC for rehabilitation. (CECC Ch. C5/R5)




431

## Alterations—Level 3



432

**KEY CONCEPT**



## Alterations—Level 3

- Level 3 Alterations involve *work areas* (space reconfiguration) > **50%** of the *building area* over a 36-month period. (604.1)
- Additional building feature upgrades are triggered beyond the *work areas*, affecting parts of the building where no alterations are planned.
- Requirements are found in Chapter 9.

Chapter 3  
(All)

+

Chapter 7  
(Level 1)

+


Chapter 8  
(Level 2)

+

Chapter 9  
(Level 3)

433

**KEY CONCEPT**



## Alterations—Level 3 (continued)

- The scope of certain provisions of Chapter 8 (Alterations—Level 2) is expanded to apply to all work areas, regardless of number of tenants and occupant load: (901.2)
  - 802: Building Elements and Materials
  - 803: Fire Protection
  - 804: Carbon Monoxide Detection
  - 805: Means of Egress

Chapter 3  
(All)

+

Chapter 7  
(Level 1)

+

Chapter 8  
(Level 2)

+

Chapter 9  
(Level 3)

434

## Alterations—Level 3

### High-rise Buildings

- Recirculating air or exhaust systems with capacity > 15,000 CFM must be equipped with smoke or heat detection devices in accordance with the *Chicago Mechanical Code*. (902.1.1)
- Elevators for public use with vertical travel in excess of 25' above or below main floor and serving *work areas* must be provided with emergency operations in accordance with *Chicago Conveyance Device Code*.
- New elevators must be provided with Phase I and Phase II operations.

435

## Alterations—Level 3

### Boiler and Furnace Equipment Rooms

- In E, I and R occupancies, boiler and furnace equipment rooms must be enclosed as required by CBC Section 509 (Incidental Uses). (902.2)
  - **Exception:** Boiler or furnace equipment within and serving a single dwelling unit.

436



### Alterations—Level 3

## Existing Shafts and Vertical Openings

- Existing exit stairways that are part of the means of egress must be enclosed as required by Section 802.2.1 (Existing Vertical Openings) from the highest story containing a *work area* down to, and including, the level of exit discharge and all floors below the level of exit discharge.



437

### Alterations—Level 3

## Townhouses

Where *work area* is in attached dwelling unit or townhouse:

- Walls separating dwelling units that are not continuous from foundation to underside of roof sheathing must be improved to provide such separation using:
  - construction materials consistent with existing wall
  - or requirements for new construction
- Work must be performed on the side of the wall that is part of the *work area*.



438

## Alterations—Level 3 Interior Finishes

- Interior finish in exits serving the work area must comply with Section 802.4 between the highest level on which there is a work area to (and including) the level of exit discharge. (903.3)



439

## Alterations—Level 3 Automatic Sprinkler Systems

- In high-rise buildings an automatic sprinkler system must be installed throughout *work areas*. Where a new fire pump or risers are required, they must be sized for future installation of sprinklers throughout the building. (904.1.1)
- In rubbish and linen chutes located within the *work area* if required by the CBC for new construction. (904.1.2)
- In *work areas* in occupancy groups F-1, M or S where upholstered furniture and mattresses are manufactured, stored or displayed. (904.1.3)

440

## Alterations—Level 3 Automatic Sprinkler Systems (continued)

- In buildings and areas listed in CBC Table 903.2.11.8, *work areas* that include exits or corridors shared by more than one tenant serving an occupant load > 30 must be provided with an automatic sprinkler system: (904.1.4)
  - High-rise buildings
  - Atriums
  - Underground buildings
  - Group I-2
  - Stages
  - Special amusement buildings
  - Airport control towers
  - Aircraft hangars
  - Incidental uses

441

## Alterations—Level 3 Fire Alarm and Detection

- Fire alarm and detection systems must be provided per CBC 907 as required for new construction. (904.2)
- Where manual fire alarm system is required by the CBC for a specific occupancy, must be provided throughout *work areas*.
- Fire alarm system is not required to be extended into existing occupied tenant spaces on floors located entirely outside of the *work areas*.



442

### Alterations—Level 3

## Automatic Fire (Smoke) Detection

- When required by the CBC for new construction, automatic fire (smoke) detection must be provided throughout the *work area*. (904.2.2)
  - See CBC Section 907.2, for example:
    - Ambulatory care
    - Equipment rooms
    - Institutional and residential occupancies

443

### Alterations—Level 3

## Means of Egress

- The means of egress in a Level 3 Alterations project must comply with Section 805 (Means of Egress) for Level 2 Alterations throughout all work areas regardless of tenants and occupant load. (905.1)
- Means of egress lighting within exit enclosures must be upgraded to new construction standards from the highest work area to the level of exit discharge.
- Exit signs must be upgraded to new construction standards from the highest work area to the level of exit discharge.

444

## Alterations—Level 3 Structural

- When *substantial structural alterations* are being made, the lateral load-resisting system of the altered building must be evaluated and shown to comply with CBC Sections 1609 (Wind Loads) and 1613 (Earthquake Loads). Reduced seismic forces are allowed to be used as part of the design. (906.2)

**SUBSTANTIAL STRUCTURAL ALTERATION.** An alteration in which the gravity load-carrying structural elements altered within a 5-year period support more than 30 percent of the total floor and roof area of the building or structure. The areas to be counted toward the 30 percent shall include mezzanines, penthouses, and in-filled courts and shafts tributary to the altered structural elements.

445

KEY CONCEPT



## Alterations—Level 3 Energy Conservation

- Level 3 alterations do not require the entire building to comply with the energy requirements of the *Chicago Energy Conservation Code* (CECC). (907.1)
- Work associated with the Level 3 alteration project must comply with the CECC for rehabilitation. (CECC Ch. C5/R5)




446



447

**KEY CONCEPT**



## Change of Occupancy

- The requirements of Chapter 10 are typically in addition to the requirements of Chapters 7, 8, and 9.
- Unlike the IEBC, the CBRC does not include a change of use without change of occupancy classification as a change of occupancy.
- A permit (*with plans*) is required for a change of occupancy. (1001.2)

Chapter 3  
(All)

+

Chapter 7  
(Level 1)

+

Chapter 8  
(Level 2)

+

Chapter 9  
(Level 3)

+

Chapter 10  
(Change of Occupancy)

449



## Change of Occupancy— Definition

**CHANGE OF OCCUPANCY.** A change in the use of a *building* or a portion of a *building* that results in any of the following:

1. A change of classification to a different major occupancy group (for example, from Group A-2 to Group B).
2. A change of classification from one group to another group within a major occupancy group (for example, from Group A-2 to Group A-3).

...

450



## Change of Occupancy— Definition (continued)

...

3. A change of classification from one condition to another condition within an occupancy group (for example, from Group I-2, Condition 1 to Group I-2, Condition 2).

A change of use that does not result in a change of occupancy classification (for example, from a restaurant to a tavern, which are both classified as Group A-2 occupancies) is not a *change of occupancy*.

451

## Change of Occupancy— Creation of Incidental or Special Use

- Where a change of occupancy involves creating an incidental use listed in CBC Table 509 or one of the following special uses or occupancies described in CBC Chapter 4, the incidental or special use must comply with the CBC. (1002.1)
  - Ambulatory care facilities
  - Atriums
  - Group I-2 occupancies
  - Hazardous materials
  - Motor vehicle-related occupancies
  - Motion picture projection rooms
  - Special amusement buildings
  - Stages and platforms
  - Underground buildings

452

## Change of Occupancy— Structural

- Structural elements carrying tributary live loads must be evaluated based on design live loads from CBC Section 1607 for new occupancy/use. (1006.1)
  - Structural elements whose demand-capacity ratio based on the change of occupancy  $\leq 5\%$  greater than the demand-capacity ratio based on the previously approved design live loads are allowed to remain as-is.
  - If new demand-capacity ratio  $> 5\%$ , structural element must be upgraded.

453



## Change of Occupancy— **Structural** (continued)

- Where change of occupancy results in building being assigned to a higher risk category (CBC Section 1604.5), the structure must be evaluated for compliance with CBC Section 1608 (Snow Loads) and Section 1609 (Wind Loads) based on the new risk category. (1006.2)
  - Exception if the area of the new occupancy is less than 10 percent of the building area.
  - Cumulative effective of occupancy changes over time must be considered.

454

## Change of Occupancy— **Structural** (continued)

- When change of occupancy results in the building being assigned to Risk Category IV, the structure must comply with IBC Section 1613 (Earthquake Loads) based on the new risk category. (1006.3)
- Structural upgrades also required to any building/structure which provides operational access to (or egress from) an area which, because of a change of occupancy, is in Risk Category IV. (1006.4)
- Where access to a Risk Category IV structure is less than 10 feet from an abutting property line or another structure, protection from falling debris is required. (1006.4)

455

## Change of Occupancy— Electrical

- Upon change of occupancy, unsafe conditions must be corrected, but the electrical system is not required to fully comply with CEC new construction requirements. (1007.2)
- Electrical service must be evaluated based on the new occupancy and upgraded if required by the CEC. (1007.3)
- Minimum number of electrical outlets (receptacle and lighting) from CEC based on new occupancy. (1007.4)



**Remember:** Electrical change of use requirements in Section 308.1. These will also apply to many changes of occupancy.

456

## Change of Occupancy— Mechanical

- There are two triggers for compliance with new construction requirements of the *Chicago Mechanical Code*:
  - New occupancy has different kitchen exhaust requirements
  - New occupancy has increased mechanical ventilation requirement

(1008.1)



457

## Change of Occupancy— Plumbing

- If the occupancy has increased or different fixture requirements, fixtures must be provided per the *Chicago Plumbing Code*. (1009.1)
- If the occupancy has increased water supply requirements, the new occupancy must comply with the intent of the CPC. (1009.1)
- If the new occupancy will produce chemical wastes, chemicals must be neutralized before entering plumbing or plumbing materials made compatible. (1009.4)
- If the occupancy is changed to Group I-2, the plumbing must comply with new construction requirements. (1009.5)

458

## Change of Occupancy— Plumbing (continued)

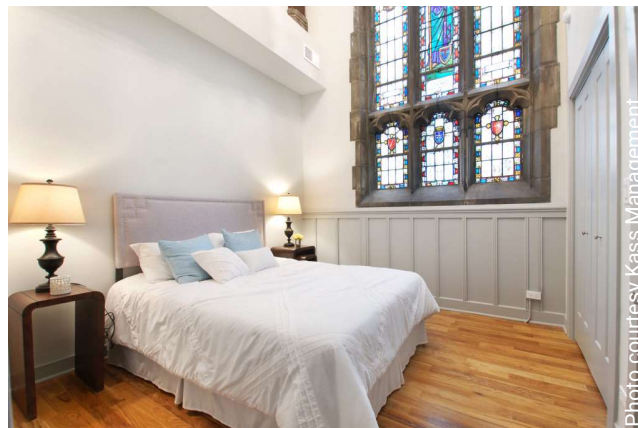
- Any existing sanitary waste lines above food or drink preparation or storage areas must be panned or protected to prevent leaking pipes or condensation from contaminating food or drink. (1009.2)
- New drainage lines may not be installed above food or drink preparation or storage areas. (1009.2)
- If the new occupancy will produce grease- or oil-laden wastes, grease interceptor is required. (1009.3)



459

## Change of Occupancy— Light and Ventilation

- Natural light and ventilation must be provided as required by the CBC (Sections 1202.1 and 1204.1) for the new occupancy.
  - Group I-1, I-2, and R dwelling units and sleeping units
  - Group E and I-4 childcare spaces and regular classrooms



460

## Change of Occupancy— Separation Options

- If the changed occupancy is **separated** from other occupancies in the building in accordance with CBC Section 508.4, the requirements of Chapters 7, 8 & 9 apply throughout the changed occupancy and do not apply in the remainder of the building. (1011.1.1.2)
- If the changed occupancy is **not separated** from other occupancies, the requirements of Chapters 7, 8 & 9 apply throughout the building. (1011.1.1.1)

461

## Change of Occupancy— Fire Protection Systems

- If CBC Chapter 9 requires sprinkler system for new occupancy, sprinkler system must be installed throughout [fire] area. (1011.2.1)
- If CBC Chapter 9 requires fire alarm or detection system for new occupancy, system must be installed through area of changed occupancy. (1011.2.2)
- New alarm system must be integrated with existing system as directed by CFD. (1011.2.2)

462

## Change of Occupancy— Interior Finish

- In areas of a building undergoing a change of occupancy, the interior wall and ceiling finishes and floor finishes must comply with interior finish requirement in CBC Chapter 8 based on the new occupancy. (1011.3)



463

## Change of Occupancy— Means of Egress

- Occupancy groups are ranked based on their relative risk with regards to the requirements for means of egress per Table 1011.4.
  - Occupancies with hazardous materials (Group H) and defend-in-place protocols (Groups I-2, I-3, I-4) are the greatest risk.
  - Non-residential occupancies with minimal fuel loads and low density occupant loads are considered the lowest risk.

464

## Change of Occupancy— Means of Egress (continued)

**TABLE 1011.4**  
**Means of Egress Hazard Categories**

Relative Hazard	Occupancy Classification
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; R-5; S-1
5	F-2; S-2; U

465

## Change of Occupancy— Means of Egress (continued)

Where change is made to a **higher** hazard category (lower number) the means of egress must be upgraded to meet CBC Chapter 10 with the following exceptions: (1011.4.1)

- Stairway enclosure per CBRC 903
- Existing stairways, including handrails and guards unless determined to be unsafe by Department
- With ACAR, rebuilt stairway slope and pitch, rise and tread, use of winders, where restricted by existing construction
- Existing corridor walls of wood lath and plaster or ½" gypsum wallboard
- Existing corridor openings per CBRC 805.5
- Existing dead-end corridors per CBRC 805.6

466

## Change of Occupancy— Means of Egress (continued)

Where change is made to a **lesser or equal** hazard category:

- Existing means of egress components must comply w/ CBRC 905 for the new occupancy.
- New means of egress components must comply with CBC Chapter 10.
  - Stairways replacing an existing stairway in a space where the pitch or slope cannot be reduced because of existing construction are not required to comply with the rise and run requirements of CBC.



Grand Hyatt San Francisco / flickr.com

467

## Change of Occupancy— Means of Egress (continued)

- Egress capacity must meet or exceed the occupant load calculated per CBC Section 1004. (1011.4.3)
- Existing stairway handrails must comply with CBRC 805.9 in the area of the change of occupancy. (1011.4.4)
- Existing guards must comply with CBRC 805.11 in the area of the change of occupancy. (1011.4.5)



468

## Change of Occupancy— Height and Area

**TABLE 1011.5**  
**Heights and Areas Hazard Categories**

RELATIVE HAZARD	OCCUPANCY CLASSIFICATION
1 (Highest Hazard)	H
2	A-1; A-2; A-3; A-4; I; R-1; R-4, Condition 2
3	E; F-1; M; R-2; S-1
4 (lowest hazard)	A-5; B; F-2; S-2; R-3; R-4, Condition 1; U

469



## Change of Occupancy— Height and Area (continued)

- Where change is made to a **higher** hazard category (lower number) the height and area must comply with CBC Chapter 5 (or 403). (1011.5.1)
  - **Exception:** For high-rise buildings constructed in compliance with a permit and equipped throughout with an NFPA 13 sprinkler system, rating reductions will be allowed as at the time of original construction.

470

## Change of Occupancy— Height and Area (continued)

- Where change is made to a **higher** hazard category, fire barriers in separated mixed occupancies must meet CBC fire resistance requirements. (1011.5.1)
  - **Exception:** For fire barriers required to have a 1-hour fire-resistance rating, plaster-and-lath in good condition or ½-inch gypsum wallboard is acceptable.

471

## Change of Occupancy— Height and Area (continued)

- Where change is made to a **lesser or equal** hazard category the height and area is deemed acceptable. (1011.5.2)
- For example: Group F-1 (factory) to R-2 (apartments)



472

## Change of Occupancy— Exterior Walls

**TABLE 1011.6  
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

473

## Change of Occupancy— Means of Egress

- Where change is made to a **higher** hazard category (lower number) exterior walls must comply with fire resistance and opening protective requirements of CBC. (1011.6.1)
  - Exterior opening protectives are not required in Group R buildings up to 4 stories. (1011.6.3, Ex. 2)
  - Exterior opening protectives are not required in fully-sprinklered buildings. (1011.6.3, Ex. 3)
- Where change is made to a **lesser or equal** hazard category exterior walls, including openings, are acceptable. (1011.6.2)

474

## Change of Occupancy— Vertical Shafts

- Vertical shafts shall be designed per CBC for atriums or requirements of CBRC 1011.7. (1011.7.1)

### Stairways

- Where means of egress hazard category is increased, interior stairways connecting more than 2 stories or in Group I occupancies must be enclosed as required by CBC. (1011.7.2)
- Where occupancy is changed to Group R, interior stairways must be enclosed as required by CBC 713, but stairs, elevators, and escalators may be in the same enclosure. (1011.7.4.1)

475

## Change of Occupancy— Vertical Shafts (continued)

### Other than Stairways

- Where means of egress hazard category is increased, vertical shafts other than stairways must be enclosed as required by CBC. (1011.7.3)
  - Existing 1-hour-rated enclosures are acceptable.
  - Existing vertical openings, up to 6 stories, are acceptable in fully sprinklered buildings (except Group I).
- Where means of egress hazard category is not increased, for other than Group R, the existing enclosure of vertical shafts is acceptable.

476

## Change of Occupancy— Vertical Shafts (continued)

### Opening Protectives

- Openings in existing shaft enclosures must be protected by minimum 1-hour fire protection rated assemblies.
  - must be self-closing or automatic-closing upon actuation of a local smoke detector.
  - Except for stairway enclosures, existing fusible link-type automatic door-closing devices are allowed to remain so long as the fusible link rating does not exceed 135°F.




477



478

**KEY CONCEPT**

 **Additions**

- Additions must comply with the CBC except as provided in the CBRC. (1101.1)
- Additions cannot create or extend any code deficiency in an existing building. (1101.2)
- The existing building can remain without any alterations provided the addition does not impact the existing building. (1101.1)

Chicago Building Code

-

Chapter 11 (Additions)

+

Chapter 3 (All)

479

## Additions— Height and Area

- An addition cannot increase the height of an existing building beyond that permitted by Chapter 5 of the CBC. (1102.1)
- An addition cannot increase the area of an existing building beyond that permitted by the CBC for new construction. (1102.2)
  - But fire wall can be used to create separate building
- In-filling of existing floor openings and adding non-occupiable appendages, such as elevator hoistways and stairway shafts, is permitted beyond the area limitations allowed by the CBC. (1102.2, Ex.)

480

FOR EXAMPLE



## Additions— Example

- The church was constructed in 1972 and exceeds the height and area limitations of the current code.
- The addition in the picture is allowable due to the fact that it is a nonoccupiable exit stairway connecting the sanctuary on the upper level to the parish hall on the lower level.



481

## Additions— Fire Protection Systems

- Where an existing *fire area* is increased in area by an addition, the entire resulting *fire area* must comply with the fire protection requirements of CBC Chapter 9 as applicable. (1102.3)
- Where the aggregate area or occupant load of *fire areas* is increased by an addition beyond a trigger in CBC Chapter 9, the addition and existing building must be made to comply with CBC Chapter 9. (1101.2)

482

## Additions— Structural

- Where an addition work will cause an increase in design dead, live or snow load  $> 5\%$  on existing elements, the existing affected gravity load-carrying element(s) must be replaced or modified to carry the gravity loads required by the CBC for new construction. (1103.1)
- Any existing gravity load-carrying element(s) whose load-carrying capacity is decreased as part of the addition is an altered structural element and is subject to the requirements of Section 806.2. (1103.1)



483

## Additions— **Structural** (continued)

- Any existing gravity load-carrying element(s) that will form part of lateral load path for the addition is considered an existing lateral load-carrying structural element and is subject to the requirements of Section 1103.3. (1103.1)
- There is an exception for existing Group R-5 buildings and additions that comply with conventional light-frame construction provisions of the CBC.

484

## Additions— **Structural** (continued)

- Where the addition is **structurally independent** of the existing building, the existing lateral load-carrying elements can remain as-is.
- Where the addition is **not** structurally independent of the existing building, the existing building and the addition acting as a single structure must meet CBC Sections 1609 (Wind Loads) and 1613 (Earthquake Loads) using full seismic forces.

485



## Additions— **Structural** (continued)

### Exceptions:

- Existing Group R-5 buildings and additions that comply with conventional light-frame construction provisions of the CBC, or
- Existing lateral load-carrying structural elements whose demand-capacity ratio with the addition included is **< 10%** greater than its current condition without the addition, can remain as-is.

486

## Additions— **Smoke Alarms**

- When an addition is made to a Group R or I-1 occupancy, the entire existing building must be provided with smoke alarms in accordance with Section 504.8 of the *Chicago Minimum Requirements for Existing Buildings*
  - Interconnected (unless no work to install wiring and wiring can be installed in attic or crawlspace)
  - Hard wired (unless no work to install wiring and wiring can be installed in attic or crawlspace)

487

## Additions— Carbon Monoxide Alarms

- When an addition is made a building which is required to have carbon monoxide alarms by the *Chicago Minimum Requirements for Existing Buildings* (Section 504.9), the entire existing building must be provided with carbon monoxide alarms in accordance with that section as part of the permitted work.



Phonlamai Photo / shutterstock.com

488

## Additions— Energy Conservation

- Additions to existing buildings must comply with the energy requirements of the *Chicago Energy Conservation Code* (CECC) for new construction. (1107.1)
- The CECC provides 3 options:
  - The addition alone complies
  - The existing building and addition comply when evaluated as a single building
  - The building with the addition will use no more energy than the existing building

(CECC C502.1, R502.1)



Greens MPs / flickr.com

489



490

**KEY CONCEPT** **Historic Buildings**  
(Chapter 12)

- Chapter 12 provides optional relief from some requirements for historic buildings
- To use Chapter 12 provisions, the building must be investigated and evaluated (in person) by an architect/engineer and a written report prepared and submitted (1201.2)
- Unsafe conditions must be remedied (1201.5)

Level of Work  
(R, L1, L2, etc.)

-

Chapter 12  
(Historic Buildings)

491

KEY CONCEPT

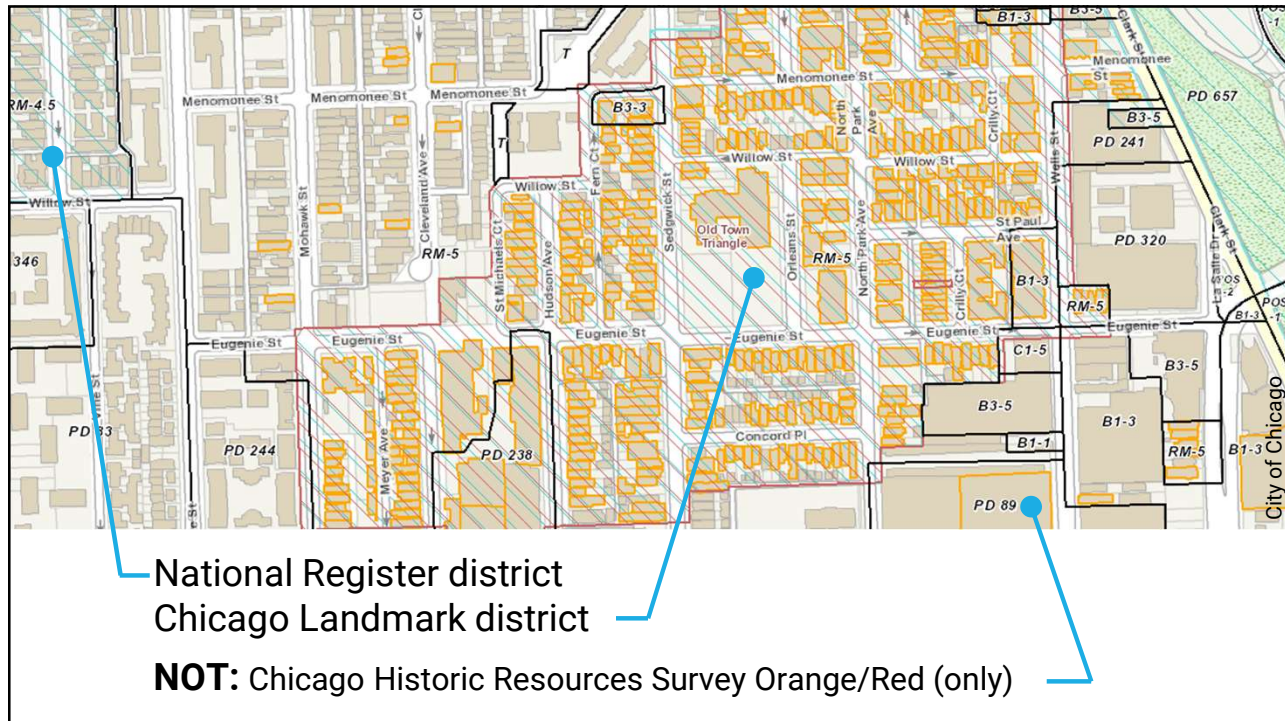


# Historic Buildings (continued)

**HISTORIC BUILDING.** Any *building* or *structure* that is one or more of the following:

1. Listed, or certified as eligible for listing, by the State Historic Preservation Officer or the Keeper of the National Register of Historic Places, in the National Register of Historic Places.
2. Designated, recommended or preliminarily recommended for designation as a Chicago Landmark, including as a contributing building in a Chicago Landmark district . . .
3. Certified as a contributing resource within a National Register historic district.

492



493

## Historic Buildings—Evaluation Report

Written report must:

- ID building safety features that comply with code
- ID building features that are not in compliance
- Describe impact of strict compliance on contributing historic features
- Propose alternatives to achieve equivalent level of safety

\*Written report requirement may be waived by DOB supervisor where warranted and equivalent information conveyed on construction documents.

494

## Historic Buildings—Repair

- Allowed to use original or like materials and methods of construction
- No hazardous materials (asbestos, mercury, lead, etc.)
- Replacement glazing must meet safety glazing requirements (exceptions: glass block, decorative glass, louvers)
- Historic features may be rebuilt, even if they do not meet current requirements (low guards, narrow door openings)

(1202)

495

## Historic Buildings—Alterations

### Fire-resistive Construction

- Stairway enclosures up to 3 stories only required to limit spread of smoke with tight-fitting doors (1203.6)
- Lath (wood or metal) and plaster construction always accepted in lieu of 1-hour fire-resistance-rating (1203.7)
- Glazing and transoms allowed to remain in construction required to have 1-hour fire-resistance rating where sprinkler system provided (1203.4, 1203.8)
- CFD may approve automatic fire-extinguishing system or life-safety system as alternative (1203.12)

496

## Historic Buildings—Alterations (continued)

### Means of Egress

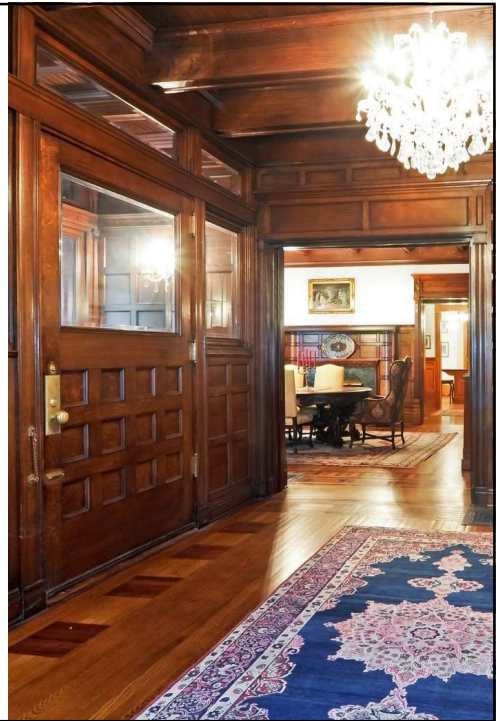
- Existing door, corridor, and stairway widths, less than required, may be approved (ACAR) (1203.3)
- Door swing variances may be approved (ACAR) (1203.3)
- Handrail and guard requirements do not apply to historically-significant open stairs (1203.9)
- Other handrails and guards may remain if they are not structurally unsound; historic opening patterns may remain or be rebuilt (1203.9, 1203.10)
- CFD may approve alternative exit signage (1203.11)

497

## Historic Buildings— **Alterations** (continued)

### Interior Finishes

- Existing historic interior finishes are acceptable as-is (1203.5)



498

## Historic Buildings— **Change of Occupancy**

### Height and Fire Separation Distance

- Allowable floor area may exceed CBC Ch. 5 limit by 20% (1204.2)
- Fire-resistance requirements for opening protectives, exterior walls, and exterior wall projections based on fire separation distance may be met with alternative methods (1204.3)  
(Only triggered if hazard index increase per Table 1011.6)

499

## Historic Buildings— Change of Occupancy (continued)

### Interior and Exterior Finishes

- Interior finishes must be Class C, surfaced with an *approved* fire-retardant paint or finish, or the building must be protected with an automatic sprinkler system (1204.9)
- Roof covering must be at least Class C (1204.5)



500

## Historic Buildings— Change of Occupancy (continued)

### Fire-resistive Construction

- Lath and plaster construction always accepted in lieu of 1-hour fire-resistance-rating (1204.10)
- Transoms allowed to remain in construction required to have 1-hour fire-resistance rating where sprinkler system provided, or in 2-hour walls or nonsprinklered building if fixed wire glass installed on one side (1204.8)
- Existing stairways may comply with requirements applicable to alterations (1204.11)

501



## Historic Buildings— **Change of Occupancy** (continued)

### **Means of Egress**

- Existing door, corridor, and stairway widths, less than required, and occupant load may be limited by approved operational controls (ACAR) (1204.6)
- Door swing variances may be approved (ACAR) (1204.7)
- Handrails and guards may comply with requirements for alterations (1204.11)
- CFD may approve alternative exit sign locations (1203.11)
- Historic stairs (Group B or R) may have 75 psf live load (1204.13)

502

## Historic Buildings—**Structural**

- Existing floors and existing live loads may be approved (ACAR) based on operational controls (1205.1, Ex. 1)
- Repair of substantial structural damage may comply with lesser requirements (1205.1, Ex. 2)
- Dangerous conditions, as determined by DOB, must be remedied. No further structural work is required. (1205.2)

503



CODE BOOK

## Historic Buildings— Energy Conservation

- Historic buildings may also use a report to modify energy conservation requirements for rehabilitation projects.
- Report must establish that compliance with specific requirement to be waived would “threaten, degrade or destroy historic form, fabric or function” of the building.
  - *Chicago Energy Conservation Code C501.6*
  - *Chicago Energy Conservation Code R501.6*

504



CODE BOOK

## Historic Buildings— Accessibility

- Only the Illinois Historic Preservation Agency (IHPA) can approve alternatives to accessibility requirements for accessible routes, entrances, or toilet rooms where:
  - Compliance is **not** technically infeasible
  - The alternative is sought to protect the historic significance of the facility (305.9)


See Section 202.5 of the *Illinois Accessibility Code* for more information.




505



507

**KEY CONCEPT**  **Building Rehabilitation Code—  
Intent**

- Rehabilitation work cannot create or expand nonconformity.
- Newly built features/elements/spaces comply with new construction requirements.
- Existing spaces that are altered subject to modified requirements.
- Level 3 alterations and change of occupancy may trigger work outside *work area*.




508

**KEY CONCEPT**

## Work Area Method Types of Work

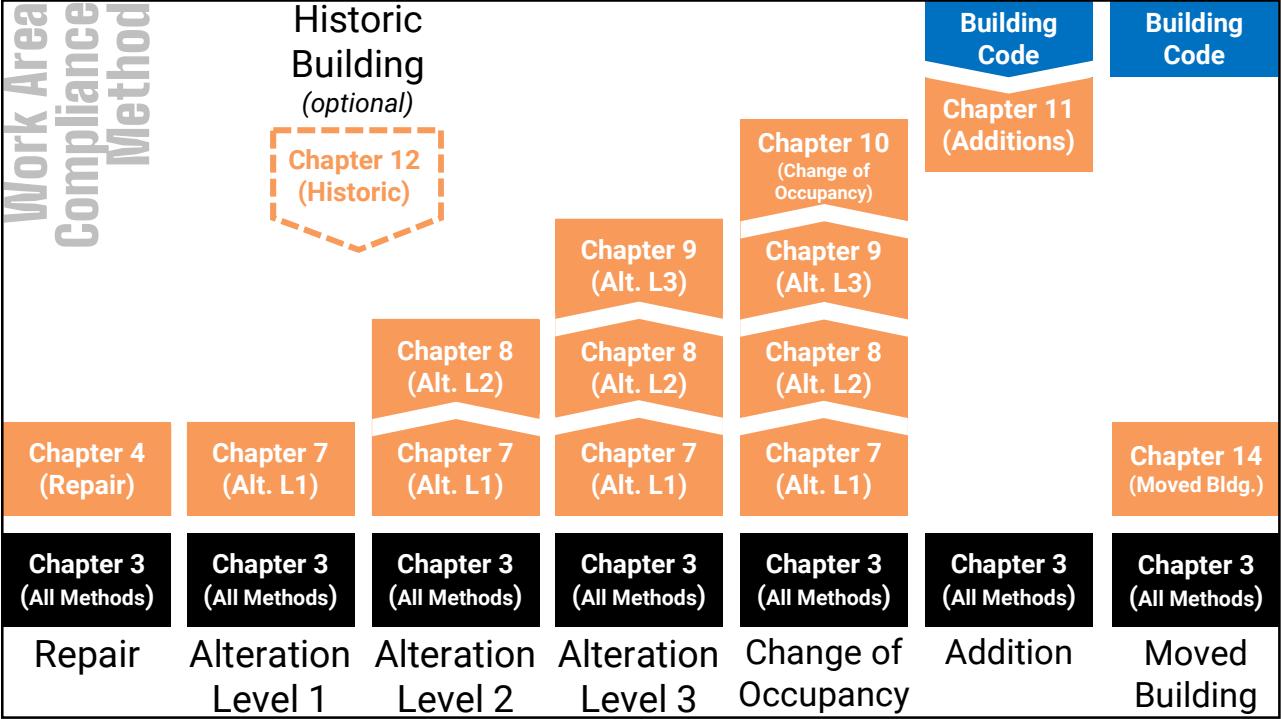
- Repair
- Alteration
- Incidental / code-mandated work
- Change of occupancy
- Addition
- Relocated building

+ Optional special rules for historic buildings.



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509



510



513