

# SPRING

## Career Development Programs

### CFSCG Part III Series: New Construction and/or Renovation of Manufacturing Occupancies

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### **Course Objective**

Following this seminar, the attendee will be familiar with the provisions of the International Existing Building Code and understand the impact of its application on enforcement of the Connecticut Fire Safety code.

### **Exclusions**

*The purpose of this seminar is to acquaint the Fire Official with the provisions of the International Existing Buildings Code (IEBC). The seminar only deals with those issues of interest to the fire code official and that have an implication regarding fire safety and fire code compliance. Therefore, topics such as accessibility and structural stability which are also important provisions of the IEBC are not covered.*

### **Sec. 29-292-15e. Alternative Compliance**

*Any building or structure, or portion thereof, evaluated and determined to be in compliance with the International Existing Building Code®, as adopted and amended by the State Building Code, or Chapter 34 of the State Building Code, shall be deemed in compliance with this section of the Connecticut State Fire Safety Code. (Part III CFSC)*

### **IEBC Philosophy**

Encourage the use and reuse of existing buildings and not unnecessarily increase construction costs. (ICC Commentary)

*"IEBC is intended as a fair and reasonable approach to the enhancement of public safety within existing buildings without gaining full compliance as required for new construction"*

### **Implications to the Fire Marshal**

Full compliance with the Connecticut Fire Safety Code will not be required.

Code compliance determined during review of construction documents submitted for building permit.

Code compliance for future inspections based upon the construction documents.

### **Intent**

To establish the minimum requirements to safeguard the public health, safety and welfare insofar as they are affected by the repair, alteration, change of occupancy, addition, and relocation of existing buildings.

### **Existing Buildings**

The legal occupancy of any building or structure existing on the date of adoption of this code shall be permitted to continue without change, except as is specifically covered in this code or in the 2005 Connecticut Fire Safety Code. (Section 101.4 IEBC CT Supplement)

### **Correction of Violations of Other Codes**

"Repairs or alterations mandated by any property, housing, or fire safety maintenance code or mandated by any licensing rule or ordinances adopted pursuant to law shall conform only to the requirements of that code, rule, or ordinance and shall not be required to conform to this code unless the code requiring such repair or alteration so provides." (Section 101.8 IEBC)

*Intended to keep the requirements of the other code intact and separate from the require-*

ments of the IEBC

### **Means of Egress**

101.13 Means Of Egress (added)

*In addition to the requirements of this code, means of egress in existing buildings shall meet the requirements of the provisions of Part IV of the Connecticut State Fire Safety Code for the proposed occupancy. (2009 Proposed CT Supplement)*

### **Classification of Work**

—  
Repair  
Alteration-Level 1  
Alteration-Level 2  
Alteration-Level 3  
Addition  
Change of occupancy  
Relocated or moved buildings  
Historic buildings

\*More than one classification can apply to a project

### **Repairs**

The restoration to good or sound condition to any part of an existing building for the purpose of its maintenance. (Section 202 2003 IEBC)

Repairs include the patching or restoration of materials, elements, equipment or fixtures for the purpose of maintaining such materials, elements, equipment or fixtures that serve the same purpose

#### **Repair Example**

A fire has caused damage to a one story-building such that many walls, ceilings and doors must be replaced, including the walls and doors of a corridor that were not fire-resistance rated but would be required to be fire resistance rated under the IBC. The walls are not load bearing.

Can the walls of the corridor be reconstructed and the doors be replaced with the same construction and doors as before the fire?

#### **NO**

*The walls of the corridor would be considered an Alternation Level 2 due to the reconfiguration of the corridor. The construction of the corridor would be considered new construction therefore Section 601.3 would apply and must comply with all of the requirements of the IBC. A permit would be required.*

## **Alteration**

Definition: Any construction or renovation to an existing structure other than repair or addition.

Three Levels

Level 1

Level 2

Level 3

## **Work Area** (*As it relates to Alterations Level 1 and 2*)

"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."

## **Alterations-Level 1**

Includes the removal, replacement or the covering of existing materials, elements, equipment or fixtures using new materials, elements or fixtures that serve the same purpose

### **Level 1 Means of Egress**

505.2 Minimum Standards (amended)

In addition to the requirements of this code, means of egress in existing buildings shall meet the requirements of the provisions of Part IV of the Connecticut State Fire Safety Code for the proposed occupancy. (Proposed 2009 IEBC CT Supplement)

### **Alterations Level 1 Example**

The owner of a five-story multi-family building plans to replace all faucets, lavatories and water closets, and all carpeting in the entire building in all units

Does this meet Level 1 alteration requirements?

**YES**

*This is an Alteration Level 1 (Sec. 303.1). All plumbing fixtures can be replaced with similar fixtures. The fixture materials, and all materials used to install the fixtures must comply with the IPC (Sec.503.3). All new carpeting must comply with the radiant flux requirements of the IBC (Sec. 503.2). No additional requirements are triggered.*

## **Alterations-Level 2**

The reconfiguration of space, including addition or elimination of a door or window; reconfiguration or extension of a system; or the installation of additional equipment

Additional limited improvements to systems such as vertical openings, fire protection systems,

structural system and means of egress are triggered. Compliance with both Chapters 5 and 6 is applicable.

Triggers based on specific thresholds

### **Supplemental requirements**

#### **Level 2 Means of Egress**

605.2 General (2005 CT IEBC Supplement)

*The means of egress shall comply with the requirements of this section.*

Exceptions

1. *Where the work area and the means of egress serving it complies with Part IV of the 2005 Connecticut State Fire Safety Code*
2. *For buildings constructed under a permit applied for on or after September 1, 1971, means of egress conforming to the requirements of the State Building Code under which the building was constructed shall be considered compliant means of egress providing that no unsafe conditions exist within the means of egress*

(Amd) 605.3.3 Main Entrance - Group A. In Group A occupancies renovated or altered to increase capacity that have a single main entrance, such main entrance shall also be the main exit. The main entrance/exit shall be of sufficient width to accommodate not less than two-thirds of the occupant load, but such width shall not be less than the total required width of all means of egress leading to the exit. The remaining exits shall be capable of providing at least one-half of the total required exit capacity.

*Exception: In assembly occupancies where there is no well-defined main entrance and main exit or where multiple main entrances and main exits are provided, exits shall be permitted to be distributed around the perimeter of the building or space containing the assembly occupancy, provided that the total width of egress is not less than 100 per cent of the required width.*

*(2005 IEBC CT Supplement)*

#### **Fire Protection / Section 604**

Requirements limited to work areas of Level 2 Alteration

If specified

Shall apply throughout the floor

Section 604 breaks down into:

Groups / Section 604.2.2

Windowless stories / Section 604.2.3

#### **Fire Alarm & detection / Section 604.4**

Breaks down into occupancy requirements

#### **Level 2 Sprinkler Requirements**

High-rise (604.2.1): required in work areas that include exits and exit access corridors shared by more than one tenant or where the occupant load is greater than 30 if the floor has sufficient water supply from an existing standpipe or sprinkler system.

Groups A, E, F-1, H, I, M, R-1, R-2, R-4, S-1, S-2 (604.2.2): required in work areas that include exits and exit access corridors shared by more than one tenant or where the occupant load is greater than 30 where all of the following conditions occur:

Work area is required to be sprinkler protected per Building Code

Work area exceeds 50% of floor area

Water supply is available without fire pump

Exception: Work Areas in Group R of 3 stories or less.

Mixed Uses (604.2.2.1): Where work areas contain one or more uses which require sprinkler protection in accordance with 604.2.2.

Windowless Stories (604.2.3): Where story is required to be protected and where sufficient water supply exists.

*NOTE: These requirements generally exceed the CFSC where the building may not have required sprinkler protection at the time of construction.*

Group E, I-1, I-2, I-3, R-1, R-2, R-4. (604.4.1.1- 604.4.1.7): As required in all work areas as required by the CFSC.

### **Smoke Alarms (604.4.3):**

Smoke alarms required in sleeping units and work areas of R Uses.

### **Level 2 Example**

*A two-story office building consists of several tenants. The upper floor is served by two open stairways. The building is of Type IIB construction. This building is not sprinklered and does not have a standpipe or fire-alarm system. Each floor is 20,000 square feet in area. A rearrangement of two tenant spaces results in reconfiguration of 45 percent of the first floor. This building does not have an elevator and the toilet rooms do not comply with the IBC accessibility requirements.*

### **Example Analysis**

*This is an Alteration Level 2 project because the reconfigured space is less than 50 percent of the building aggregate area. Level 2 alterations must comply with Chapter 6.*

Vertical openings.

*The two open stairways may remain open. (Sec. 603.2.1 Exception 1, 603.2.3 Exception and IFC Table 704.1)*

*However, as a component of the means of egress, the CFSC requires enclosure.*

### **Interior finish.**

*Interior finish in the reconfigured space corridor and new interior finishes in the reconfigured spaces must comply with the IBC or be treated with an approved fire retardant coating. (Sec. 603.4 and 503.1)*

**Sprinkler system.** - Not required (Sec. 604.2)

**Standpipes.**

*Not required (Sec. 604.3)*

**Means of egress lighting and exit sign.**

*Egress lighting and exit signs are required in the reconfigured space means of egress (Sec. 605.7 and 605.8)*

**Doors and openings.**

*The door swing, corridor door requirements and other corridor openings must comply with Section 605. This includes new corridor doors built into the main corridors as a result of new tenant finish outs (Sec.605)*

**Electrical.**

*All new electrical work in the new partitions must comply with The ICC Electrical Code, which in turn references NFPA 70 (Sec. 608.1)*

**Mechanical.**

*If the mechanical system is altered or reconfigured, compliance with IEBC Section 609.2 is required (Sec. 609.1)*

**Alterations-Level 3**

***Description***

*Alterations where the work area exceeds 50 percent of the aggregate area of the building*

*Work shall comply with these requirements and the requirements of Levels 1 & 2 Alterations in addition to the requirements for Level 3 alteration.*

***Existing exit stairways***

*Enclose as per section 603.2.*

***Interior Finish***

*Interior finish in exits within work area must comply with CSBC*

*Where work area exceeds 50% of floor area, all exits up to the work area must also comply.*

***Fire Protection***

*Automatic sprinkler system*

*Same as Level 2*

*Fire alarm & detection systems*

*Same as Level 2*

*Provide throughout as per the IBC*

***Means Of Egress***

*To comply with Level 2*

*Means of egress lighting*

*Must comply with CFSC*

*Exit signs*

*Provide from floor of highest work area to floor of exit discharge*

*Must also comply with CFSC*

### **Alterations-Level 3 Application Example**

*Consider the same office building discussed in application example of Alteration Level 2. A re-arrangement of several tenant spaces results in reconfiguration of more than 55 percent of the first floor and 50 percent of the second floor.*

### **Example Analysis**

*This is an Alteration Level 3 project because the work area as defined in Section 202 exceeds 50 percent of the building aggregate area. Level 3 alterations must comply with Chapter 7.*

*Chapter 7 requires that Level 3 Alterations comply with the requirements for Levels 1 and 2 Alterations as well as Level 3. Level 1 and 2 requirements were already discussed in previous slides. Additional requirements for Level 3 will now be discussed.*

### **Interior finish.**

*Interior finish in the upper corridor, stairways, lower corridors (both the main and new tenant) and new interior finishes in the reconfigured. Tenants must comply with the CSBC or be treated with an approved fire retardant coating*

### **Fire alarm system.**

*A manual fire alarm system is required in the work areas on both floors. Alarm notification devices must be provided on both floors (Sec. 704.2.1 and IBC Section 907.2.2)*

### **Means of egress lighting and exit sign.**

*Egress lighting and exit signs are required in the main corridors, exit stairs and within the work areas*

*Includes changes of use within the same occupancy classification*

### **Change of occupancy:**

*A change in the purpose or level of activity within a building that involves a change in the application of the requirements of this code.*

### ***Change of occupancy without change of occupancy classification***

*Conform to Chapters 5, 6 & 7 based on classification and Sections 802 and 807-811*

### ***Change of occupancy classification***

*Must conform to Chapter 7 and Sections 802-806 & 812*

### **Degree of safety enhancements based on:**

*Change to equal or lesser hazard*

Change to higher hazard

Chapter 12 (compliance alternatives) deemed equivalent

***Evaluation of hazards based on:***

*Life safety and exits*

*Height and area*

*Exposure of exterior walls*

**Special Use & Occupancy**

*Compliance to IBC for*

*Covered Malls*

*Atriums*

*Motor Vehicle Related Occupancies*

*Aircraft Related Occupancies*

*Motion Picture Projection Rooms*

*Stages & Platforms*

*Special Amusement Buildings*

*Incidental Use Areas*

*Hazardous Materials*

**2008 Amendments**

**804.1 General (amended)**

*In addition to the fire protection requirements of Section 812, the following requirements shall apply where a building or portions thereof undergo a change of occupancy classification*

**804.1.1 Fire Sprinkler System (added)**

*Where a change of occupancy classification occurs that requires an automatic fire sprinkler system to be provided based on the new occupancy in accordance with Chapter 9 of the 2003 International Building Code portion of the 2005 State Building Code, such system shall be provided throughout the building or portion thereof where the change of occupancy occurs.*

**804.1.2 Fire Alarm and Detection System (added)**

*Where a change of occupancy classification occurs that requires a fire alarm and detection system to be provided based on the new occupancy in accordance with Chapter 9 of the CSBC system shall be provided throughout the building or portion thereof where the change of occupancy occurs.*

*Existing alarm notification appliances shall be automatically activated throughout the building.*

*Where the building is not equipped with an existing fire alarm system, alarm notification appliances shall be provided throughout the area where the change of occupancy occurs and shall be automatically activated.*



### **Change of Occupancy Application Example**

*Building owner plans to convert a 2 story, VB construction, Victorian style dwelling into a law office*

*Single unenclosed interior stair provides egress from second floor.*

### **Example Analysis**

*This is a change of occupancy classification from a Group R-3 to Group B. Chapter 8 requirements are applicable.*

*Building must meet all requirements for a Level 3 Alteration (Chapter 7) except as modified for Change of Occupancy (Chapter 8).*

*Hazard category classification*

*Equal or Lesser Hazard*

*Higher Hazard*

Hazard Category: Equal in all 3 categories

Minimum Requirements:

Capacity of means of egress shall comply with CSBC

Interior finish of walls and ceilings shall comply with CSBC for new use.

Means of Egress

Existing Means of Egress can remain unchanged except:

Capacity

Handrails

Guardrails

### **Change of Occupancy Application Example #2**

*Building owner plans to convert a 2 story, VB construction, Victorian style dwelling into a gift shop*

*Single unenclosed interior stair provides egress from second floor.*

*This is a change of occupancy classification from a Group R-3 to Group M. Chapter 8 requirements are applicable.  
Building must meet all requirements for a Level 3 Alteration (Chapter 7) except as modified for Change of Occupancy (Chapter 8).*

Hazard Category:

Higher in all 3 categories

Minimum Requirements:

Must comply with Change of Occupancy provisions of Chapter 8 or Compliance Alternatives (Chapter 12).

Means of Egress

Must comply with Chapter 10 of Part III CFSC (812.4.1.1)

Exceptions:

2 story stairs exempted from enclosure in Use M by 603.2.1 Exception 9.1

Dead End Corridor Limit 35 feet (605.6)

Single exit permitted if 30 max occupants and 75' max travel distance.

Height & Area (812.4.2.1)

Must comply with CSBC for new use.

Table 503 limits height of Use M of VB construction to 1 story. Building Height is 2 story.

Sprinkler system is required to resolve height issue.

Vertical Shafts

Protection required in other than stairs.

Not required in sprinkler protected building (812.4.4.3 exc. 2)

### **Additions**

#### ***Definition***

*An extension or increase in floor area, number of stories, or height of a building or structure*

#### ***Approach***

*Additions are treated much as they are treated in the model building codes*

*Not creating or extending non-conformance of existing buildings*

*Separation is critical*

### **Historic Buildings**

*Any building or structure that is:*

*Listed in the State or National Register of Historic Places*

*Designated as a historic property under local or state designation, law or survey*

*Certified as a contributing resource within a National Register listed or locally designated historic district*

*Any building or structure that is:*

*With an opinion or certification that the property is eligible to be listed in the National or State Registers of Historic Places either individually or as a contributing building to a historic district by the State Historic Preservation Officer or the Keeper of the National Register of Historic Places*

### **Historic Buildings Approach**

*Work performed in historic buildings is permitted specific additional exceptions to IEBC requirements for repair, alterations, and change of occupancy.*

*Fire suppression systems cure all ills*

### **Relocated or Moved Buildings**

*Approach*

*Location on the lot and the foundation must comply with the IBC or IRC as applicable.*

*Other than limited exceptions, wind, seismic, snow and flood provisions of the IBC must be complied with at the new location.*

### **Compliance Alternatives**

***Scope***

*Intended to maintain or increase the current degree of public safety, health and general welfare without full compliance*

*This is the existing numerical method found in Section 3409 of the Connecticut State Building Code*

*Provisions do not apply to Occupancies in Group H or I.*

### **Compliance Alternatives Approach**

*Assigns a score to an existing building based on existing conditions and the changes anticipated in the design and compares that score to three minimum safe scores for fire, egress and general safety*

*Allows alteration/upgrade to specific elements to gain favorable score*

### **Construction Documents**

Construction documents, special inspections, structural observation programs, investigation and evaluation reports (106.1)

Construction documents shall be:

Dimensioned and drawn on suitable material.

Sufficient clarity to indicate location, nature and extent of all proposed work and work areas.

Show in detail that project will comply with all applicable codes.

Means of egress (106.1.2)

Shown in sufficient detail

Location

Construction

Size

Character

Occupant load

Sprinkler Shop Drawings

Submitted and approved prior to work

Detail as required in NFPA 13

## **Conclusion**

The IEBC one design option that is available to satisfy the requirements of the Connecticut Fire Safety Code.

The Fire Marshal must become familiar the provisions of the IEBC.

The approved construction documents become the "code" for subsequent inspections and must be maintained.

## **Reference Sources**

The following resources were utilized in preparing this presentation:

2005 Connecticut State Building Code

2005 Connecticut Fire Safety Code

2008 Proposed Code Errata

2003 International Existing Building Code

2006 International Existing Building Code Commentary

2003 IEBC Fundamentals Workbook

2006 IEBC Fundamentals Workbook