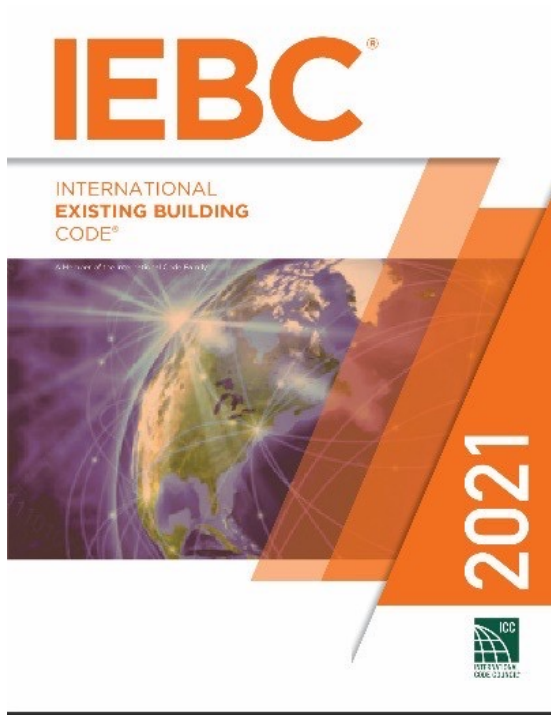




# Main Street and Building Codes Kansas Main Street

Mike Jackson, FAIA, Co-Chair  
APT Codes & Standards Technical Committee

# Codes and Standards



Safety



Energy

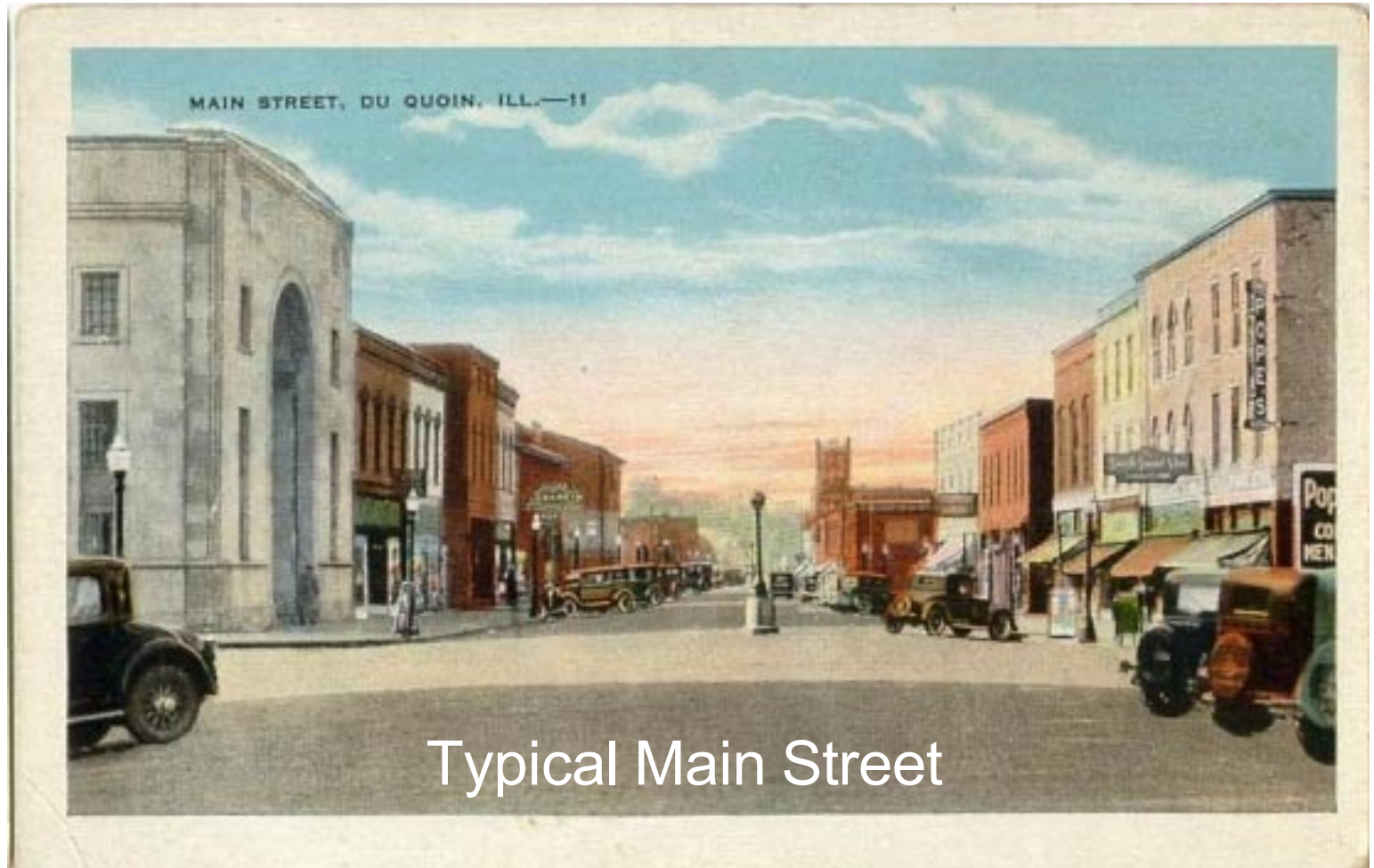


Universal Design

Two &  
Three  
Story  
Masonry  
Buildings

Zero lot line

Masonry  
Party  
Walls



# More Housing is Needed

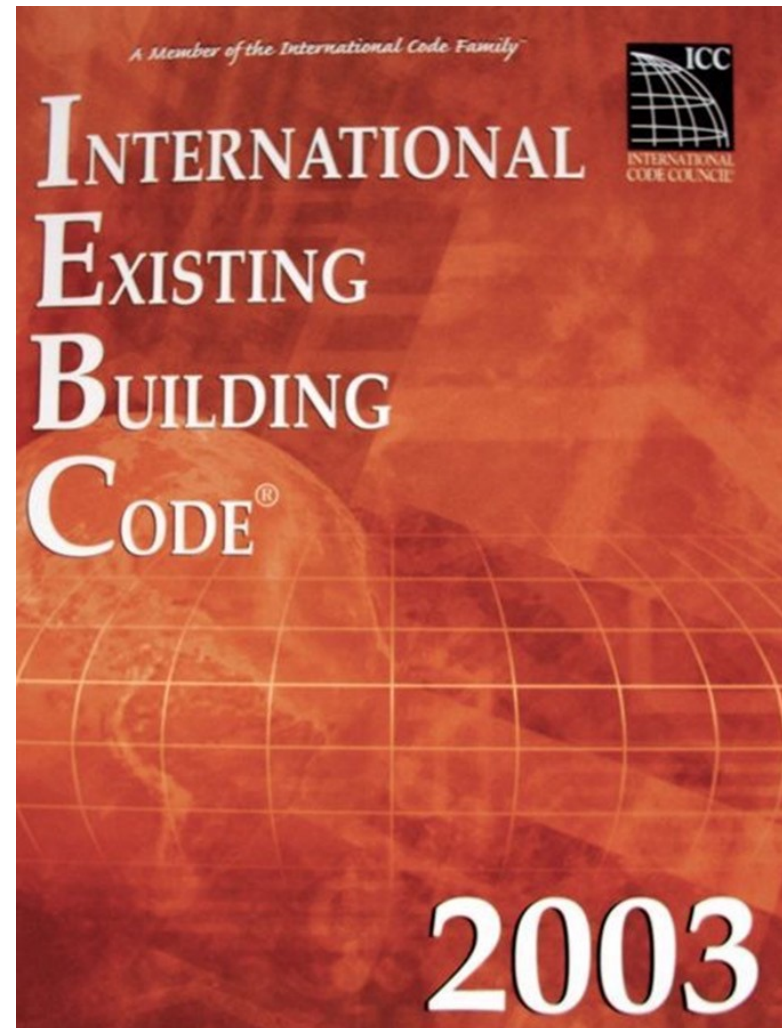
Americans have a shortage of 4,000,000 housing units

Main Street America – “make housing a priority”

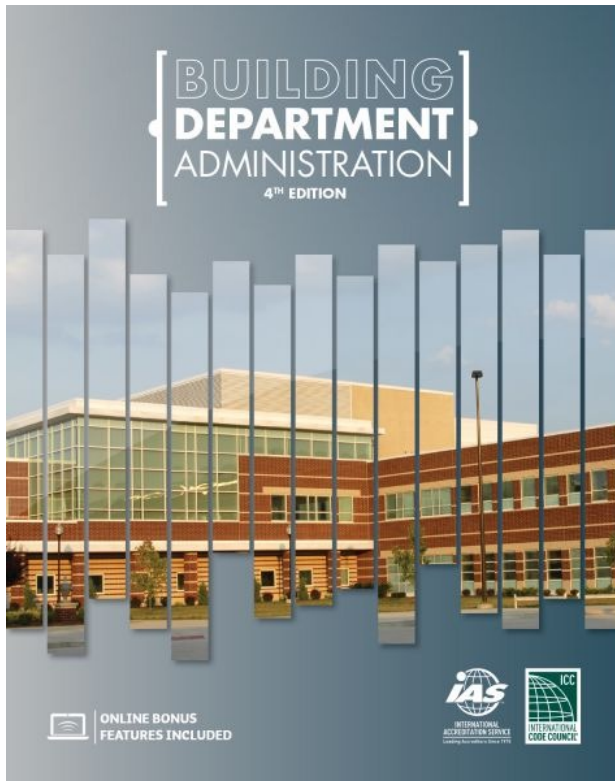
Vacant upper floors often had housing or are adaptable

When housing is a “change of occupancy” the conversion is often more expensive because of building code provisions.

International  
Existing  
Building  
Code  
2003  
—  
2021



# International Existing Building Code (IEBC)



“The repair, alteration, addition to and change of occupancy in existing buildings are in many cases more complicated to design and regulate than construction of new buildings.”

ICC Building Department  
Administration,  
4th Edition, 2012

# Why is it more complicated?

Multiple code paths

Most architects and code officials use the path for new buildings

Very little training on the IEBC

Codes reference many other standards

Code language subject to interpretation by AHJ

Historic Preservation Chapter has not been updated

Codes subject to local amendments

# Access to Design Professionals

State laws very widely

Architects or Engineers

Rural communities are underserved

Most architects do new construction



# When you need an architect?

Varies based upon proposed work

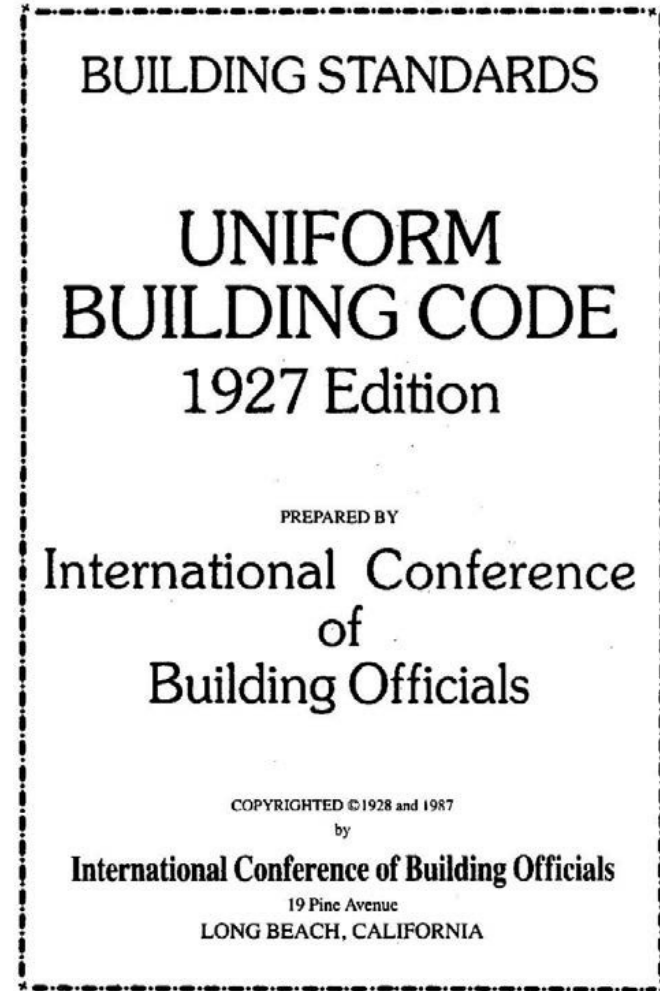
Change of Occupancy

Consult with your local code official?

# Codes & Rehab

If alterations exceed 50% of the value of an existing building the entire building shall conform to the requirements of a new building.

Change of occupancy = new



# IEBC Code Paths

Prescriptive

Most like new buildings

Work Area

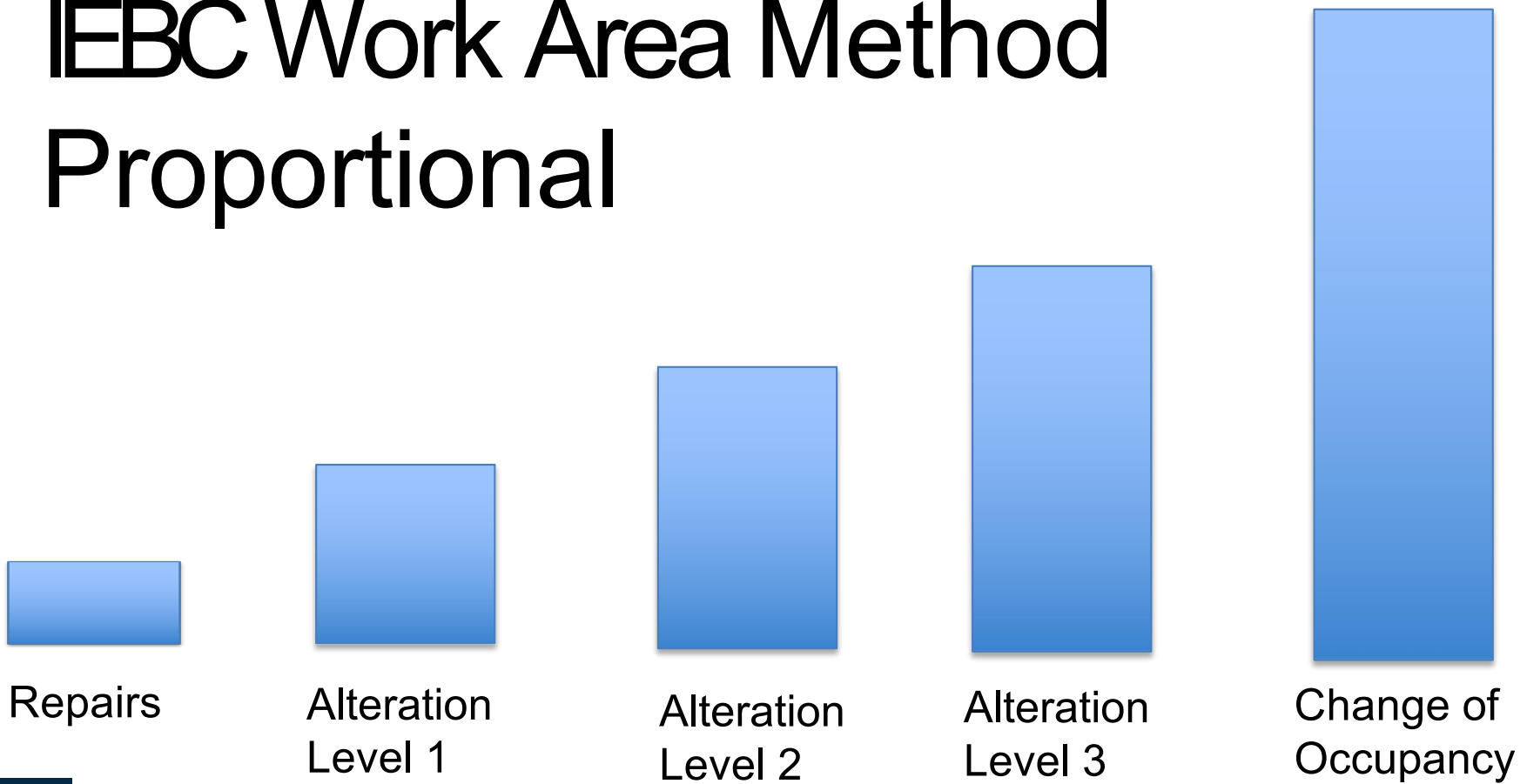
Historic Preservation Chapter

Performance

Numerical Safety Scoring

Owner/Architect select the path

# IEBC Work Area Method Proportional



# IEBC Historic Preservation (Ch. 12)

Building Area

Occupancy separation

Means of egress

Door swing

Transoms

One-hour fire resistive assemblies

Existing plaster qualifies

# IEBC Historic Preservation (Ch 12)

Stairways and guards,

Exit signs

Exit stair live load

Natural light

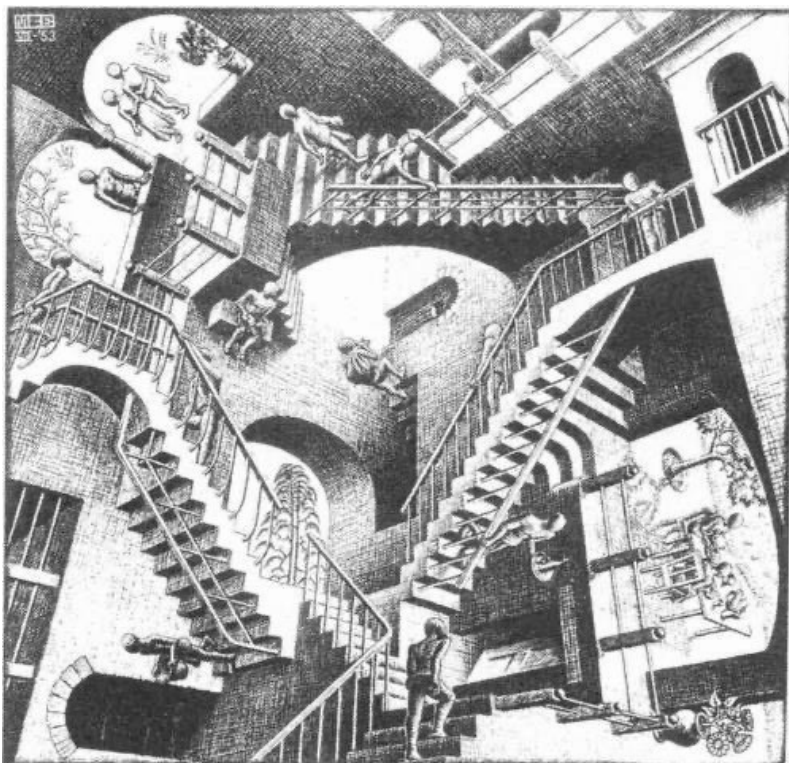
# Fire Safety and Exits



IEBC 2021. 1204.11  
Stairways and guards

Exception: For buildings less than 3,000 sq. ft., existing conditions are permitted to remain at all stairways and guards.

# Life Safety: Handrails and Guardrails



**1203.9 Stairway railings.** Grand stairways shall be accepted without complying with the handrail and guard requirements. Existing handrails and guards at all stairways shall be permitted to remain, provided they are not structurally dangerous.



# Distinct Life Safety (or Fire) Hazard



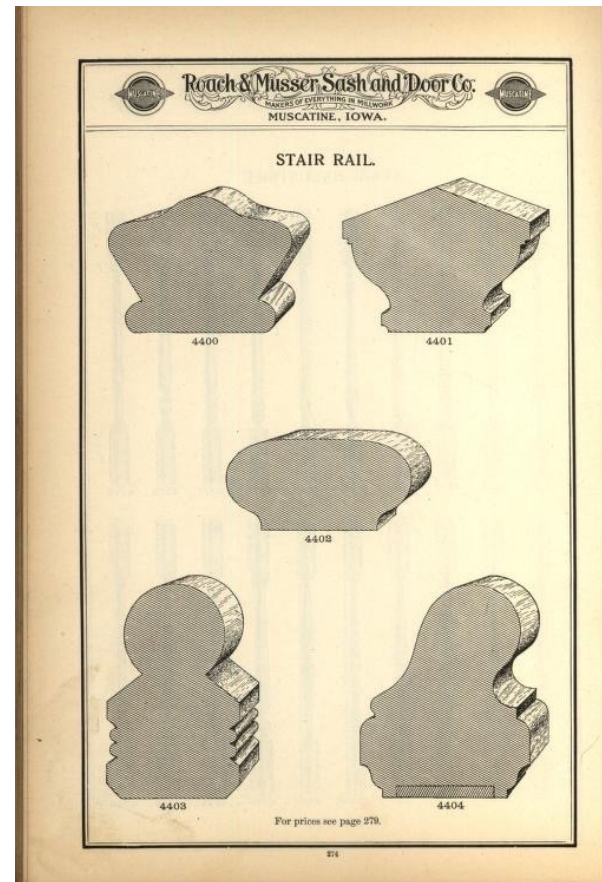
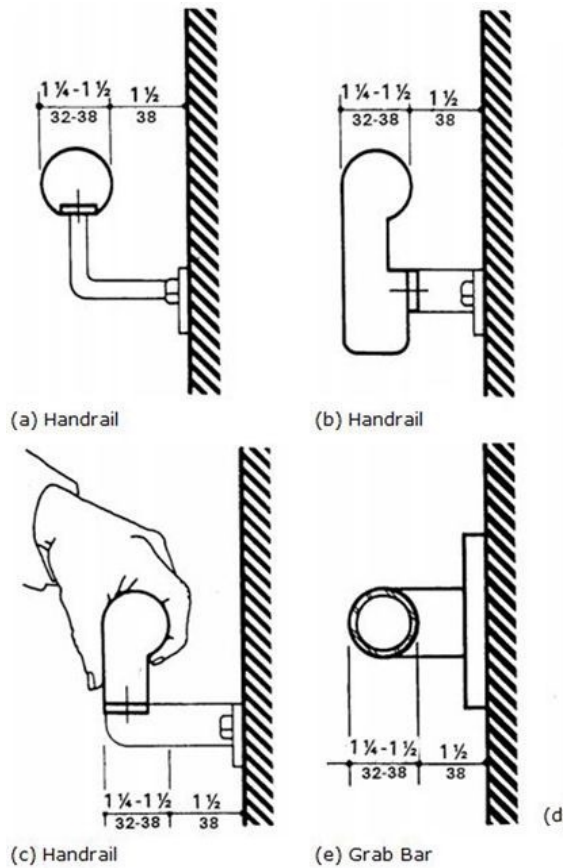
Stairs without handrails



Low Height Guardrails

# Handrail Designs

ANSI  
A117.1



Historic details c. 1904

# I-Codes & Historic Preservation

## IEBC 2021 Chapter 5 Prescriptive Compliance Method

1. Historic Buildings. The provisions of this code that require improvements relative to a building's existing condition, or in the case of repairs, that require improvements relative to a building's predamage condition, **shall not be mandatory for historic buildings** unless specifically required by this section.

2. Life Safety Hazards. The provisions of this code shall apply to historic buildings judged by the code official to constitute a **distinct life safety hazard**.

# I-Codes & Historic Preservation

IEBC 2021 Chapter 12 Historic Preservation

1203.2. Every historic building that does not conform to the construction requirements of this code ... and **constitutes a distinct fire hazard** as defined herein shall be provided with an *approved* fire extinguishing system, as determined appropriate by the *code official*.

1203.12 **Exception:** Where the code official approves an alternative life-safety system.

# Distinct Life Safety (or Fire) Hazard

Proposed APT Definition:

Any clear and evident condition that exists as an immediate danger to the safety of the occupants of a building or the adjacent public right of way. Conditions that do not meet the maintenance or operational requirements of other adopted codes do not, of themselves, constitute a distinct hazard.

(from the 2016 California Historical Building Code)

# Distinct Hazard

## Chapter 12: Repairs

1201.1 “Repairs to any portion of a *historic building* shall be permitted with like materials or original methods of construction.

Exception: Replacement glazing

Glazing in doors

Display windows lower than 18”

Easily repaired with safety films



# Change of Occupancy – Housing R-2

## Major Code Challenges

Egress

Fire Separation

Costs, Design and Construction

# Fire Safety & Number of Exits

TABLE 805.3.1.1(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 (feet)
Basement, first or second story above grade plane	R-2 <sup>a</sup>	4 dwelling units	50
Third story above grade plane and higher	NP	NA	NA

For SI: 1 foot = 304.8 mm.

Only small 2-story buildings can have one exit



# Change of Occupancy

IEBC Chapter 10, Section 1004. Fire Protection

1004.1. General. Fire protection requirements of Section 1011 shall apply where a building or portions thereof undergo a *change of occupancy* classification or where there is a change of occupancy within a space where there is a different fire protection system requirements of Chapter 9 of the *International Building Code*.

IBC Table 508.4. 2 hr separation between  
R and B or M occupancies

# Change of Occupancy

IEBC 2021 Chapter 12 (Historic Building)

1204.1 General. Historic buildings undergoing a change of occupancy shall comply with the applicable provisions of Chapter 10, except as specifically permitted in this chapter.

Issues:

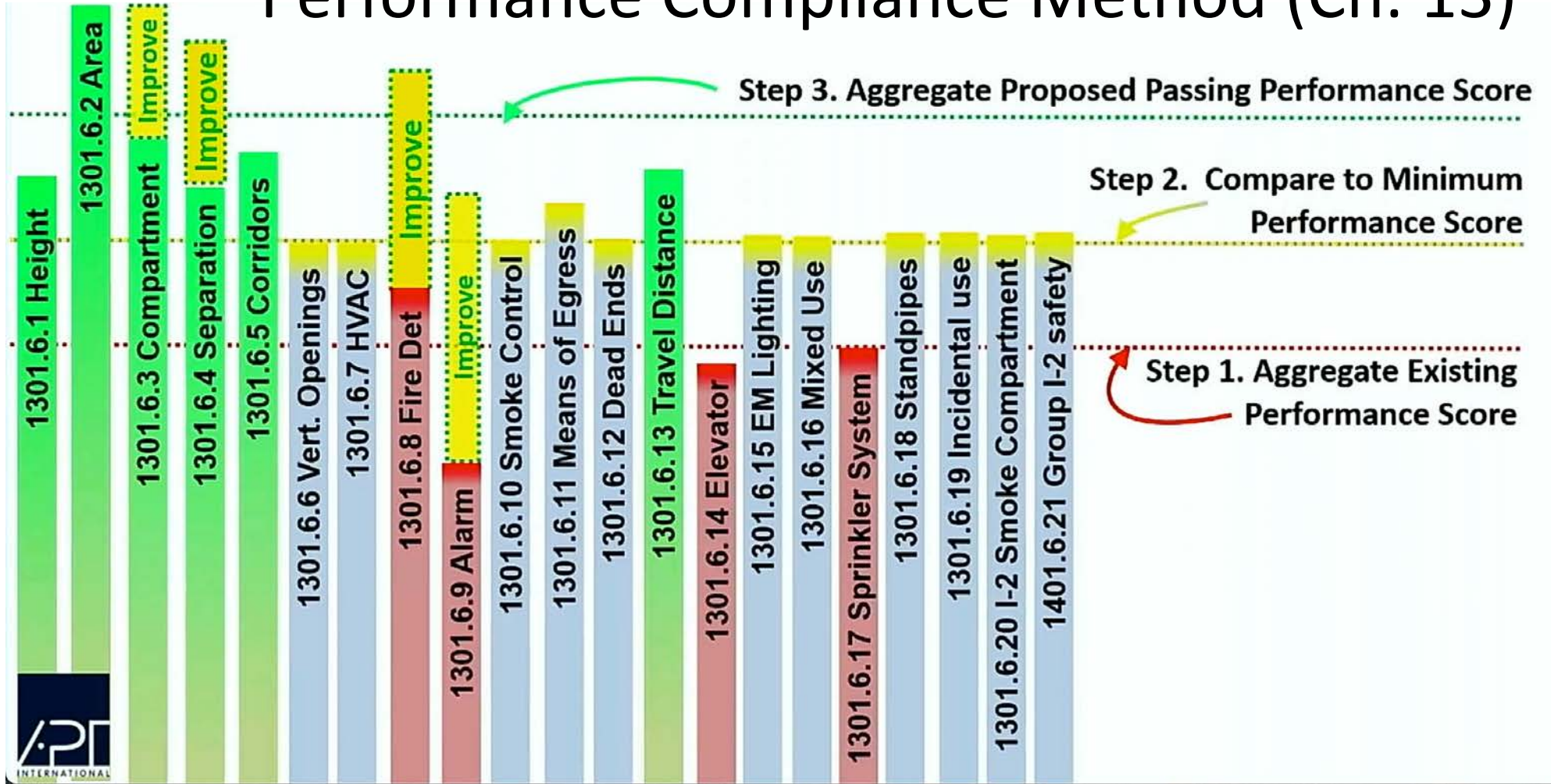
2 Hr fire separation between uses, or

Complete building sprinkler system

# IEBC Performance Compliance Method

One of the three major code paths  
The least used and understood  
Fire Safety focus  
Numerical scoring method  
Provisions of Chapter 3 apply  
Provisions of the Fire Code apply  
First used in BOCA 1997

# Performance Compliance Method (Ch. 13)



# Silverplate Bldg Aurora IL

3 stories

1,350 sq. ft. per floor

Shop on 1<sup>st</sup> Fl

2 units on 2<sup>nd</sup> Fl.

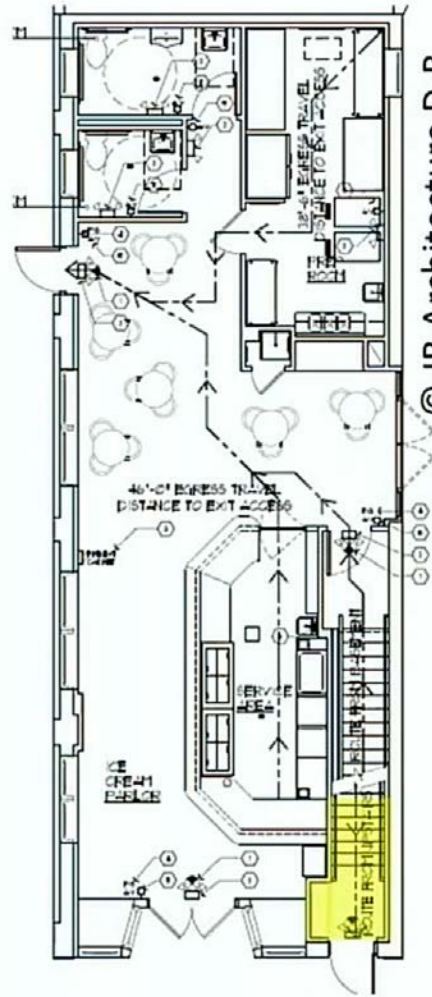
1 unit of 3<sup>rd</sup> Fl



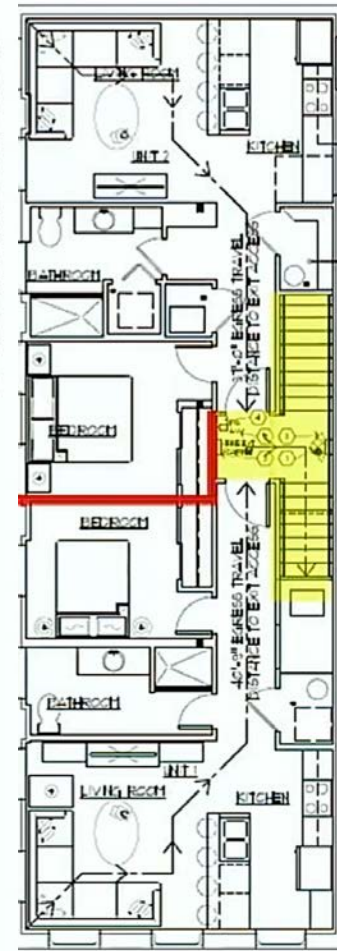
# Silverplate Bldg Aurora IL

3 stories  
1,350 sq. ft. per floor

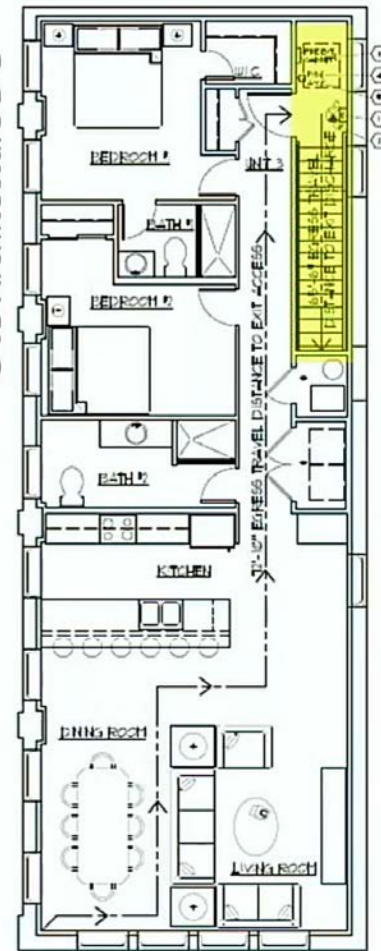
Shop on 1<sup>st</sup> Fl  
2 units on 2<sup>nd</sup> Fl.  
1 unit on 3<sup>rd</sup> Fl



Ground Floor



2<sup>nd</sup> Floor



3<sup>rd</sup> Floor

© JB Architecture D-B

© JB Architecture D-B

## Existing un-separated Silverplate

SUMMARY SHEET REFLECTING LOWEST VALUE OF EACH FLOOR IN EACH CATEGORY

SAFETY PARAMETERS	FIRE SAFETY (FS)	MEANS OF EGRESS (ME)	GENERAL SAFETY (GS)
1301.6.1 Building Height	1.0	1.0	1.0
1301.6.2 Building Area	10.5	10.5	10.5
1301.6.3 Compartmentation	12.3	12.3	12.3
1301.6.4 Tenant and dwelling unit separations	-4.0	-4.0	-4.0
1301.6.5 Corridor Walls	-7.0	-7.0	-7.0
1301.6.6 Vertical openings	2.0	2.0	2.0
1301.6.7 HVAC systems	5.0	5.0	5.0
1301.6.8 Automatic Fire detection	-10.0	-10.0	-10.0
1301.6.9 Fire alarm systems	-10.0	-10.0	-10.0
1301.6.10 Smoke control	N/A	0.0	0.0
1301.6.11 Means of egress capacity and number	N/A	-3.0	-3.0
1301.6.12 Dead ends	n/a	2.0	2.0
1301.6.13 Maximum exit access travel distance to an exit	n/a	12.8	12.8
1301.6.14 Elevator control	-2.0	-2.0	-2.0
1301.6.15 Means of egress emergency lighting	n/a	0.0	0.0
1301.6.16 Mixed Occupancies	0.0	n/a	0.0
1301.6.17 Automatic sprinklers	-6.0	-3.0	-6.0
1301.6.18 Standpipes	0.0	0.0	0.0
1301.6.19 Incidental uses	0	0	0
<b>ACTUAL TOTALS</b>	<b>-8.2</b>	<b>8.4</b>	<b>5.4</b>
<b>MANDATORY SAFETY SCORE PER IBC TABLE 1301.8</b>	<b>30.0</b>	<b>40.0</b>	<b>40.0</b>
<b>TABLE 1301.9 EVALUATION FORMULAS</b>	<b>-38.2</b>	<b>-31.6</b>	<b>-34.6</b>
	<b>FAIL</b>	<b>FAIL</b>	<b>FAIL</b>

## Separated/Alarmed Silverplate 2<sup>nd</sup> floor score

FIRE SAFETY (FS)	MEANS OF EGRESS (ME)	GENERAL SAFETY (GS)
1.0	1.0	1.0
10.5	10.5	10.5
13.7	13.7	13.7
0.0	0.0	0.0
0.0	0.0	0.0
2.0	2.0	2.0
5.0	5.0	5.0
6.0	6.0	6.0
0.0	0.0	0.0
N/A	0.0	0.0
N/A	-3.0	-3.0
n/a	2.0	2.0
n/a	12.8	12.8
-2.0	-2.0	-2.0
n/a	0.0	0.0
0.0	n/a	0.0
-6.0	-3.0	-6.0
0.0	0.0	0.0
0	0	0
<b>30.2</b>	<b>45.0</b>	<b>42.0</b>
<b>21.0</b>	<b>38.0</b>	<b>38.0</b>
<b>9.2</b>	<b>7.0</b>	<b>4.0</b>
<b>PASS</b>	<b>PASS</b>	<b>PASS</b>



Aurora IL. Silverplate Bldg.

# Ziegler Music Bldg Aurora IL

3 stories  
2,000 sq. ft / fl.

One unit per  
floor R-3

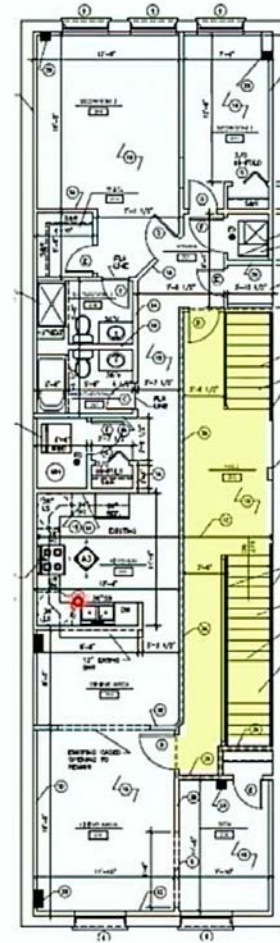




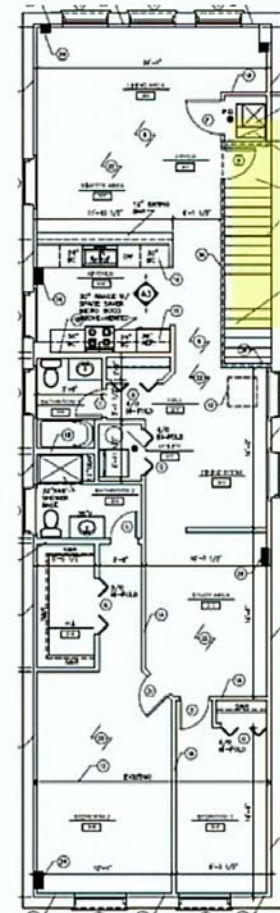
Ziegler  
Music Bldg  
Aurora IL

3 stories  
2,000 sq. ft / fl.

One unit per floor



2<sup>nd</sup> Floor



3<sup>rd</sup> Floor

© AGAMA Designs Architecture

## Existing un-separated Ziegler Music

SAFETY PARAMETERS	FIRE SAFETY (FS)	MEANS OF EGRESS (ME)	GENERAL SAFETY (GS)
1301.6.1 Building Height	1.0	1.0	1.0
1301.6.2 Building Area	10.5	12.1	12.1
1301.6.3 Compartmentation	10.0	10.0	10.0
1301.6.4 Tenant and dwelling unit separations	-4.0	-4.0	-4.0
1301.6.5 Corridor Walls	-3.0	-3.0	-3.0
1301.6.6 Vertical openings	-10.5	-10.5	-10.5
1301.6.7 HVAC systems	5.0	5.0	5.0
1301.6.8 Automatic Fire detection	-10.0	-10.0	-10.0
1301.6.9 Fire alarm systems	-10.0	-10.0	-10.0
1301.6.10 Smoke control	N/A	0.0	0.0
1301.6.11 Means of egress capacity and number	N/A	-3.0	-3.0
1301.6.12 Dead ends	n/a	2.0	2.0
1301.6.13 Maximum exit access travel distance to an exit	n/a	11.6	11.6
1301.6.14 Elevator control	-2.0	-2.0	-2.0
1301.6.15 Means of egress emergency lighting	n/a	0.0	0.0
1301.6.16 Mixed Occupancies	0.0	n/a	0.0
1301.6.17 Automatic sprinklers	-6.0	-3.0	-6.0
1301.6.18 Standpipes	0.0	0.0	0.0
1301.6.19 Incidental uses	0	0	0
<b>ACTUAL TOTALS</b>	<b>-19.0</b>	<b>-3.8</b>	<b>-6.8</b>
<b>MANDATORY SAFETY SCORE PER IEBC TABLE 1301.8</b>	<b>23.0</b>	<b>40.0</b>	<b>40.0</b>
<b>TABLE 1301.9 EVALUATION FORMULAS</b>	<b>-42.0</b>	<b>-43.8</b>	<b>-46.8</b>
<b>PASS/FAIL</b>	<b>FAIL</b>	<b>FAIL</b>	<b>FAIL</b>

## Separated/Alarmed Ziegler-Music 3<sup>rd</sup> floor scores

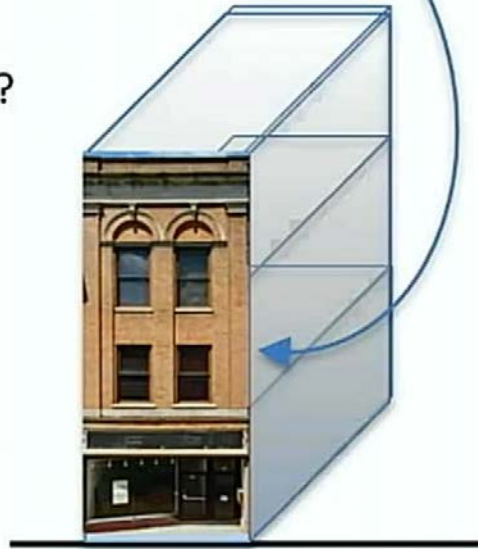
FIRE SAFETY (FS)	MEANS OF EGRESS (ME)	GENERAL SAFETY (GS)
1.0	1.0	1.0
10.5	10.5	10.5
11.7	11.7	11.7
0.0	0.0	0.0
0.0	0.0	0.0
0.0	0.0	0.0
5.0	5.0	5.0
6.0	6.0	6.0
0.0	0.0	0.0
N/A	0.0	0.0
N/A	0.0	0.0
n/a	2.0	2.0
n/a	11.6	11.6
-2.0	-2.0	-2.0
n/a	0.0	0.0
0.0	n/a	0.0
-6.0	-3.0	-6.0
0.0	0.0	0.0
0	0	0
<b>26.2</b>	<b>42.8</b>	<b>39.8</b>
<b>21.0</b>	<b>38.0</b>	<b>38.0</b>
<b>5.2</b>	<b>4.8</b>	<b>1.8</b>
<b>PASS</b>	<b>PASS</b>	<b>PASS</b>



# Main Street Building compared to IRC Townhomes

## Typical Main Street Bldg.

- 2 Floors Residential above Business / Mercantile
- Separations ?
- Fire Access?
- Limited SF
- Alarm System?



tions  
arations  
System  
tral Fire Station  
age

## Typical 3 story IRC Townhomes

- 2 Floors Residential above Fuel/Battery !
- Separations ?
- Fire Access?
- Limitation on SF?
- Alarm System?



Special Thanks to John Curley, City of Aurora IL

# Amending the Code

8-302.2 Change in occupancy.

The use or character of the occupancy of a qualified historical building or property may be changed from **or returned to its historical use...**

Such change in occupancy shall not mandate conformance with new construction requirements...



The image shows the cover of the 2016 California Historical Building Code. It features a large outline of the state of California in the background. The title '2016 CALIFORNIA HISTORICAL BUILDING CODE' is prominently displayed in bold, black, uppercase letters. Below the title, it reads 'CALIFORNIA CODE OF REGULATIONS TITLE 24, PART 8' and 'California Building Standards Commission'. At the bottom left, there is a circular seal of the California Building Standards Commission. At the bottom right, it states 'Effective January 1, 2017' and 'For Errata and Supplement effective dates see the History Note Appendix'.

## 2016 CALIFORNIA HISTORICAL BUILDING CODE

CALIFORNIA CODE OF REGULATIONS  
TITLE 24, PART 8

California Building Standards Commission



Effective January 1, 2017

For Errata and Supplement effective dates see the History Note Appendix



<http://ohp.parks.ca.gov/pages/1074/files/2016%20CA%20CHBC.pdf>

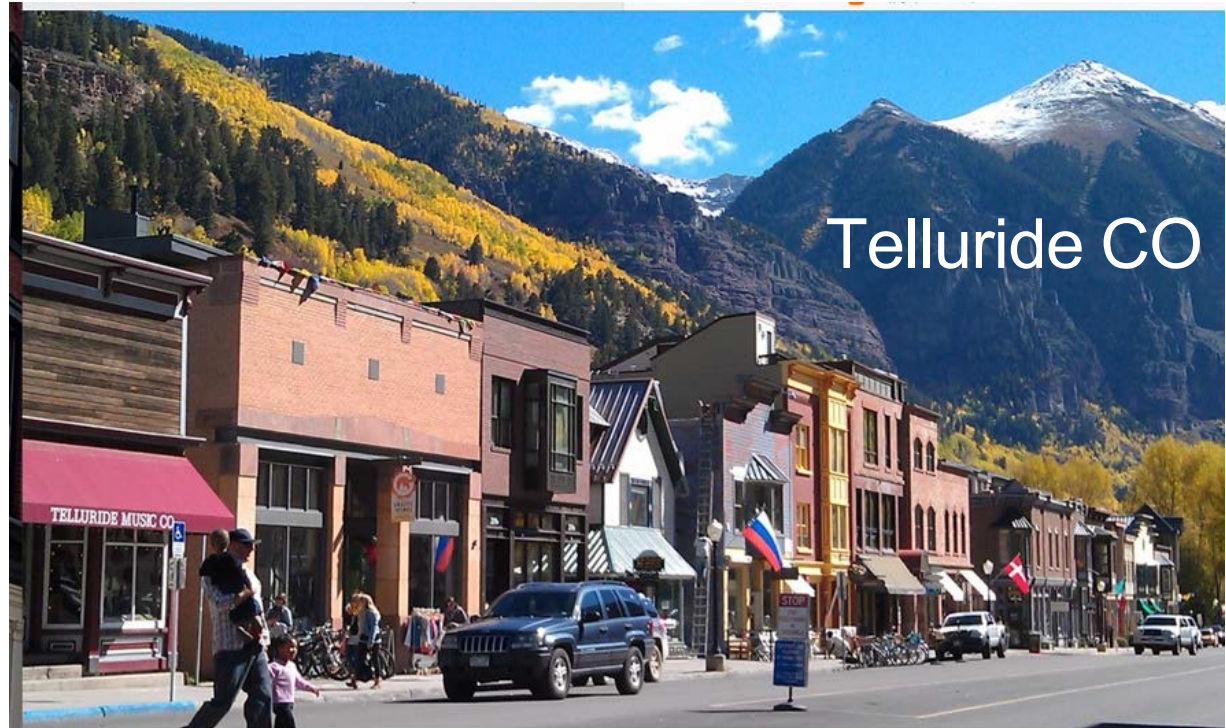
#APTNT2020

# Amending the Code

Appendix 15-A

Historic  
Building  
Enhancements  
To the IEBC

Extensive list  
of alternatives



<https://telluride.municipal.codes/TMC/15-A>

# Amending the Code

Appendix AJ of IRC

Qualifications for a historic  
preservation professional

36 CFR Part 61 or  
licensed design professional

Dimensional tolerance of 10%

Some item between 0 and 17%



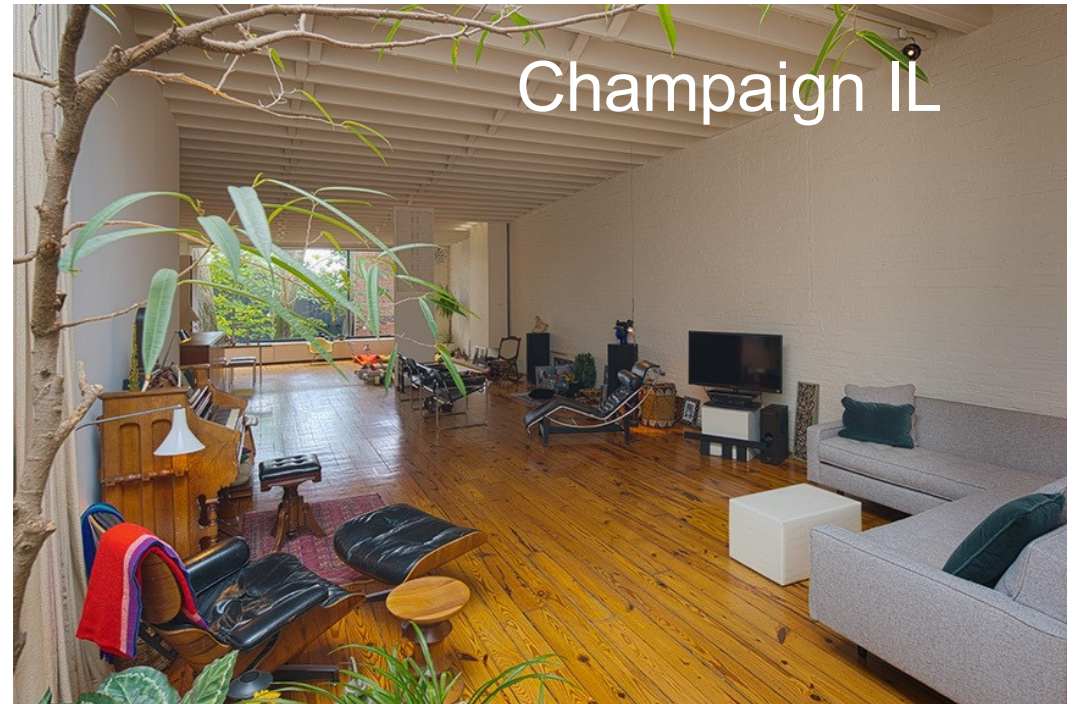
Denver CO. Larimer Square

# Memphis, TN Amends Local Building Code to Allow up to Six Units Under Residential Building Code (IRC)

On November 1, 2021, Memphis and Shelby County, Tennessee, rolled back a significant, but lesser noted regulatory hurdle by locally amending building codes to enable structures of 3 to 6 dwelling units to be reviewed by the city and county under their residential building code rather than the commercial building code.

# What if second floor units used the IRC?

Two  
Or  
Fewer  
Units

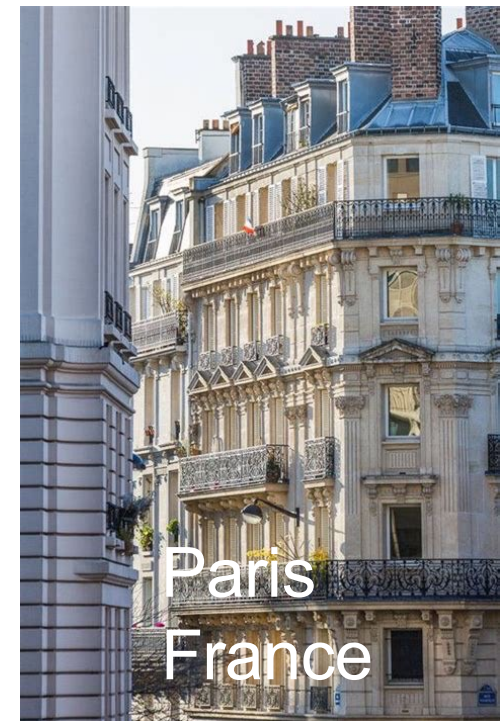


This would make it much easier to rehabilitate the very small buildings (under 3,000 sq. ft.) on Main Streets



# Charlottesville VA to allow single-staircase New buildings (with sprinklers)

MAY 5, 2022 12:03 AM



The single exit building reduces multi-family housing costs

# Current IEBC requirements

1203.2. ...an automatic fire-extinguishing system shall not be used to substitute for, or act as an alternative to, the required number of exits from any *facility*.

The IEBC allows a travel distance of 250 ft with sprinklers, and only 125 ft for building without sprinklers.

The use of sprinklers reduces the need for compartmentalization values, but does not allow any reduction in the number of exits

# APT Codes Web Site Resources

## Codes and Standards Technical Committee

The APT Technical Committee on Codes and Standards has been periodically active since the 1980s when new Existing Building Codes were being created.

Committee goals and objectives:

- Identify Leadership on the topic of building codes and standards and their impact on cultural resource conservation.
- Establish a forum for discussion of issues relating to building codes and standards in the field of historic preservation
  - Annual code committee meeting at the APT annual conference
  - APT speakers forum for code topics
- Encourage active and continuous education for professionals from many disciplines who seek a better understanding of building codes and standards and their effect on cultural resources.
- Identify areas of knowledge and practice where further study and/or research is required to establish parameters of practice.

Co-Chairs:

[Mike Jackson](#)

[Marilyn Kaplan](#)

[Building Codes and Historic Preservation: Webliography](#)

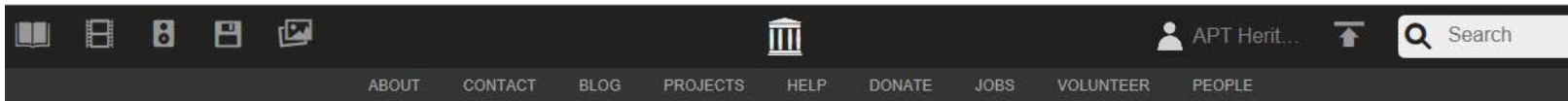
[State and Local Historic Building Codes](#)

[Legacy Building Codes Online](#)

[Proposed Changes to the International Existing Building Code](#)

<https://www.apti.org/codes-and-standards>

# Legacy Code Archive



## Building Technology Heritage Library

Association for Preservation Technology, Int.

The Building Technology Heritage Library (BTHL) is primarily a collection of American and Canadian, pre-1964 architectural trade catalogs, house plan books and technical building guides. Trade catalogs are an important primary source to document past design and construction practices. These MORE

- Share
- Favorite
- Edit
- History
- Play All

ABOUT

COLLECTION

13 RESULTS

uniform building code

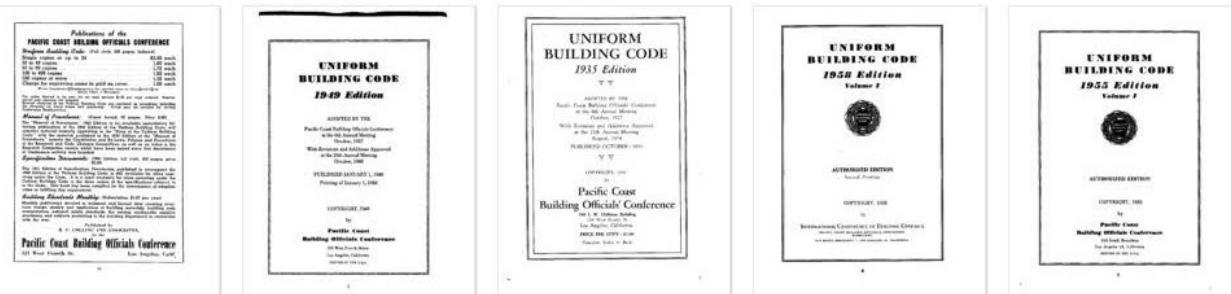
- Metadata
- Text contents

PART OF

Catalogs Collection  
Additional Collections

Media Type

SORT BY VIEWS · TITLE · DATE PUBLISHED · CREATOR



<https://archive.org/details/buildingtechnologyheritagelibrary>



# APT Code Case Studies -2023

To be  
Posted  
On the  
APT  
Codes &  
Standards  
Web  
Page



# Questions?

Thank You  
Mike Jackson