UPSTAIRS DOWNTOWN

ARCHITECTURAL ASSESSMENT

"Whatever you are doing on housing, double it."

Patrice Frey

Typical Main Street Building

Coucil Grove KS

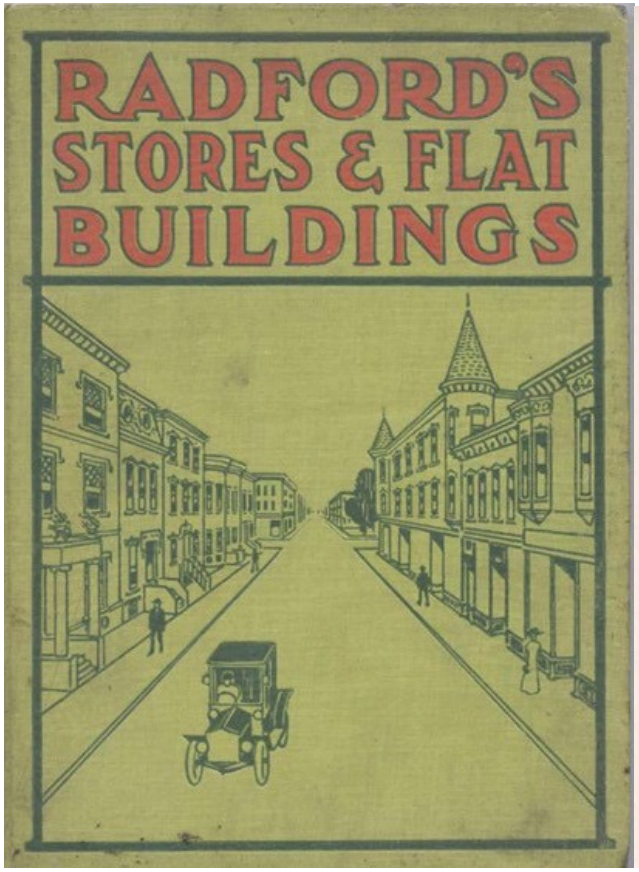
Two stories, 20 ft wide, 75-100 ft length

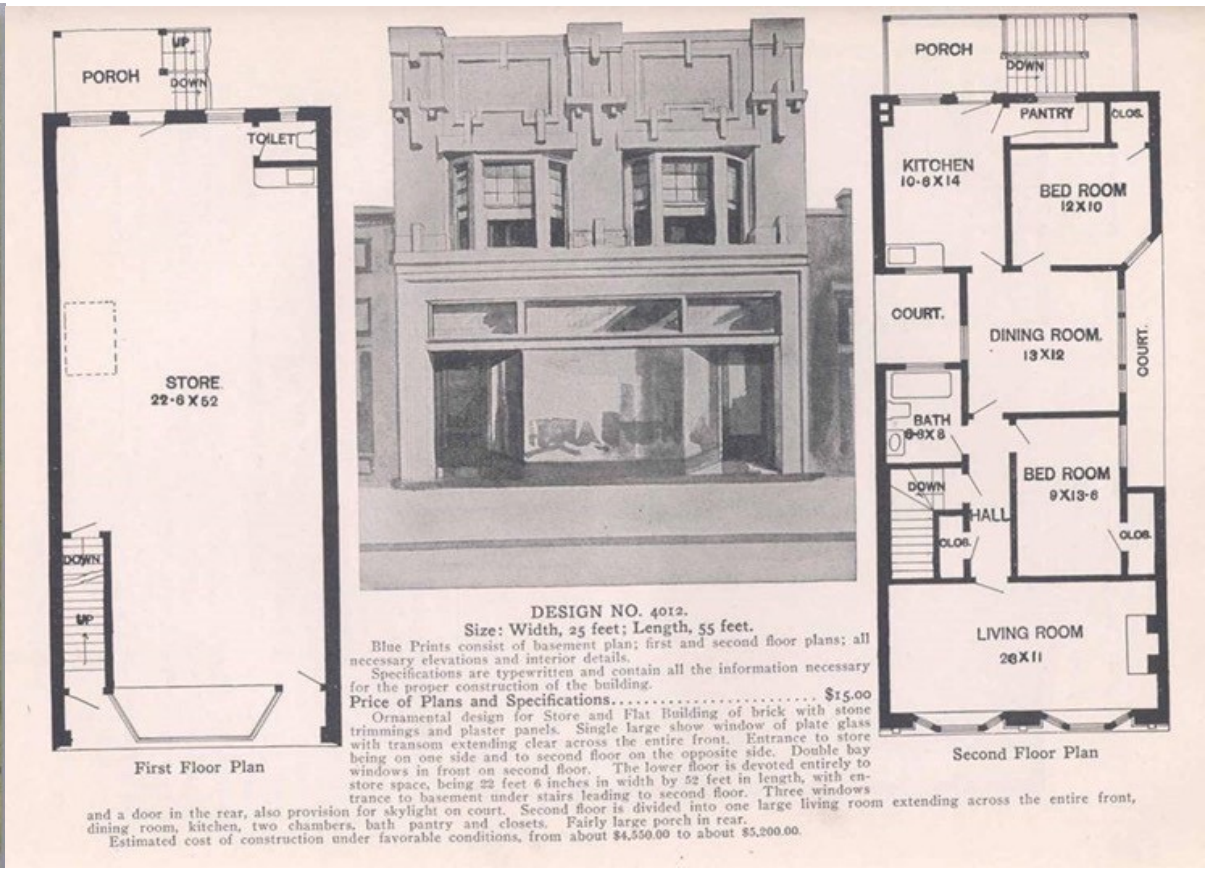
Take a night time walk on Main Street.

FEASIBILITY
Architectural/Economics

- The architectural, regulatory and fiscal variables that affect feasibility.
- The resources your Main Street program should have to facilitate feasibility studies.

HISTORY LESSON





Residential use on the upper story was very common.

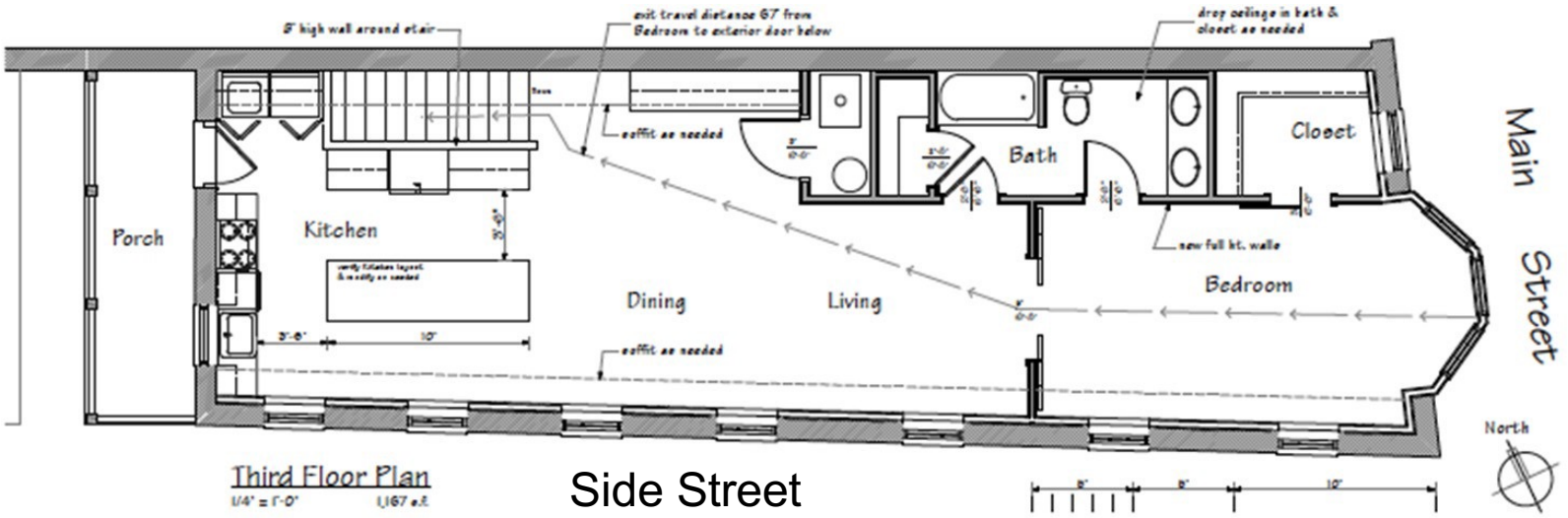
https://archive.org/details/RadfordsStoresAndFlatBuildings

MARKET FORCES

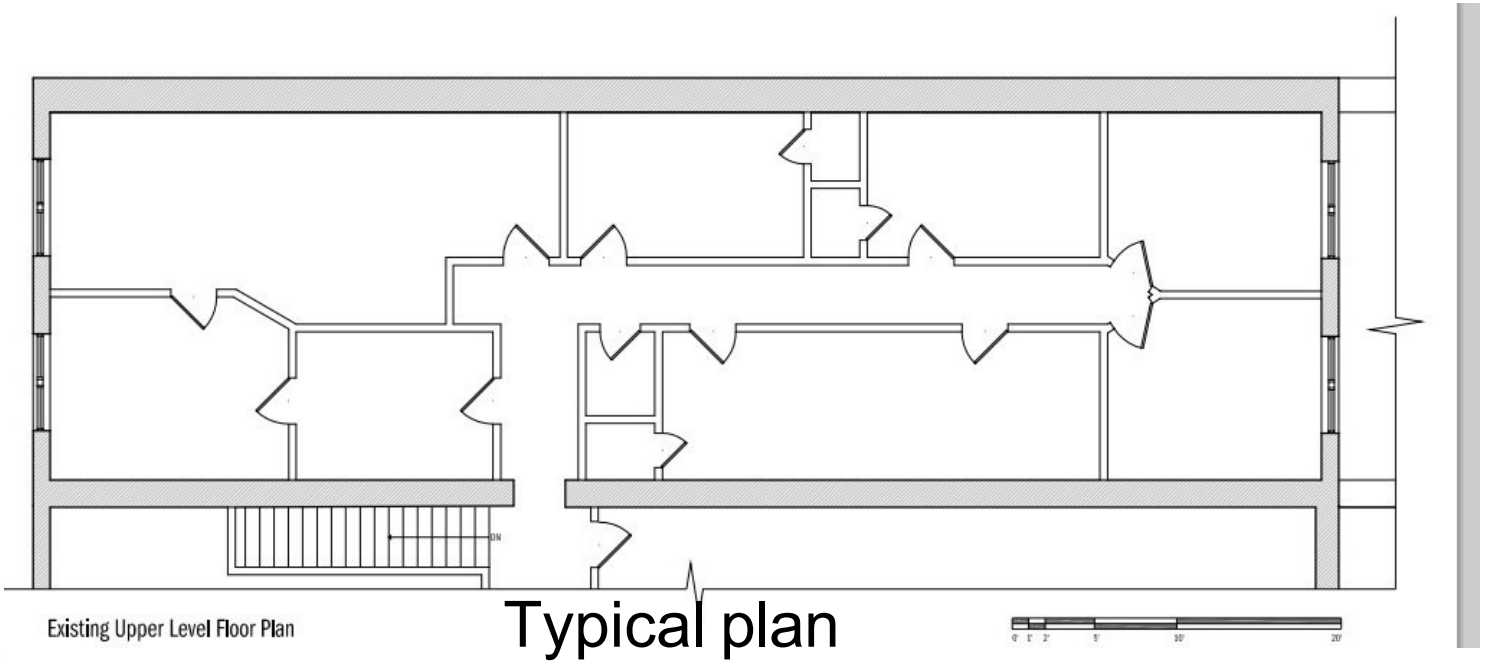
- One, One+ or Two-Bedroom Units
- Large open floor plan (800-1,200+ sq. ft.)
- Washer and dryer in units
- One+ Large bedroom and study
- All new electrical and HVAC systems
- Amenities
  - Outdoor balcony or deck
  - Study are storage space
  - Enclosed parking
  - Elevator

THE OPEN PLAN UNIT

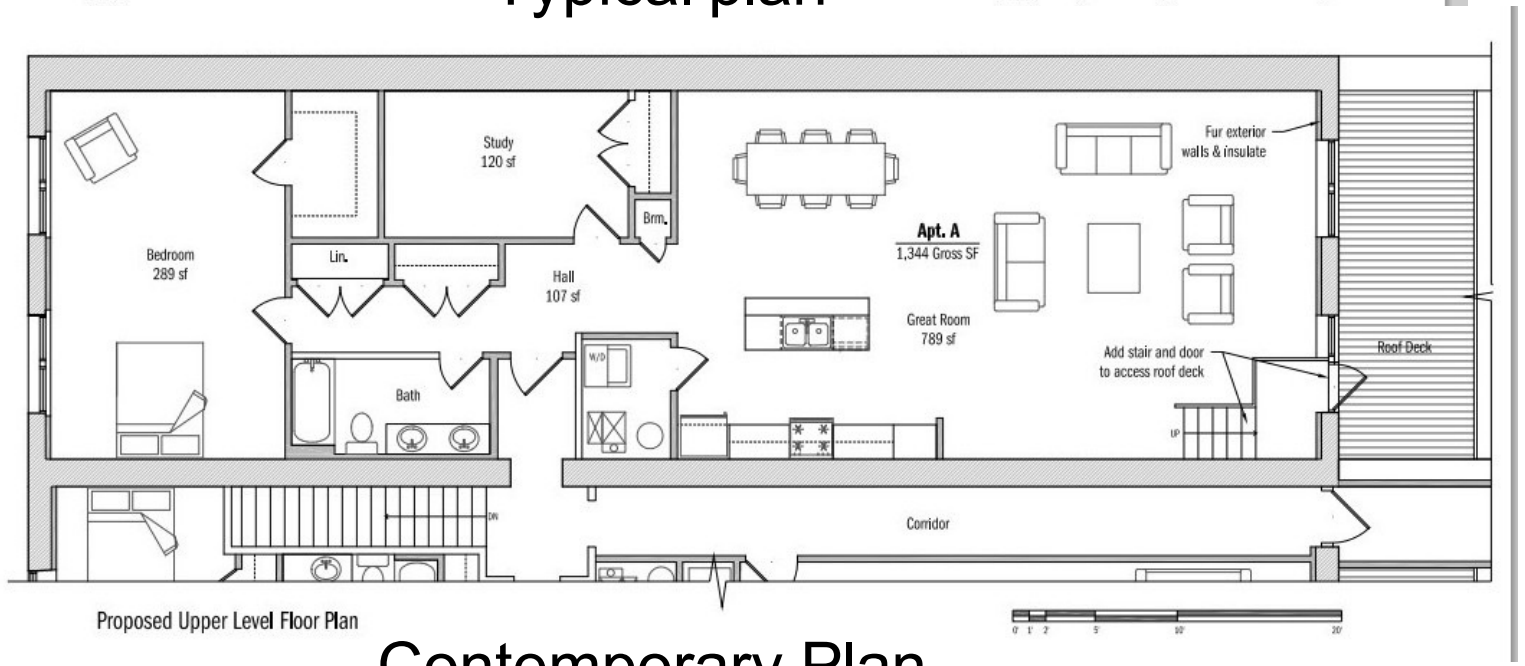
Corner Bldg



Main Street



Typical plan



Contemporary Plan

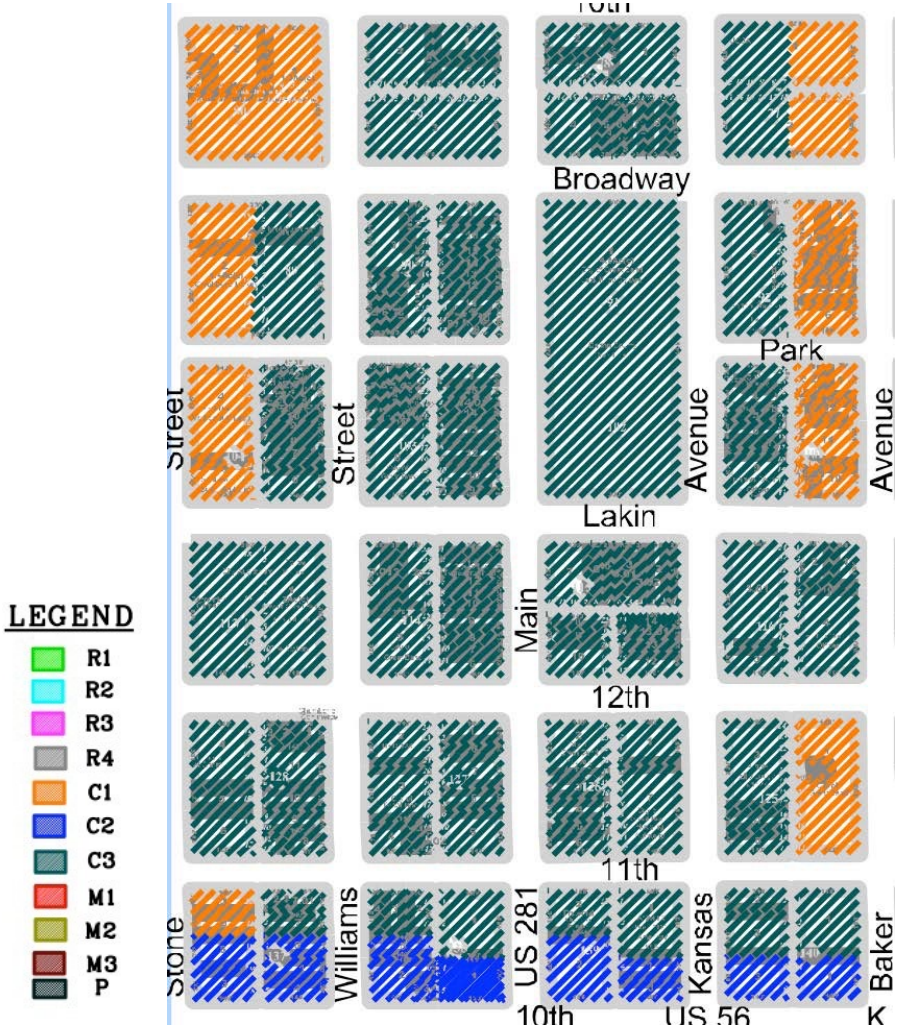
DESIGN MATTERS

- The “Cool” Factor

- **Tall Ceilings**
- Period Trim
- Open Plan
- High Quality

“Error on the side of quality”

SITE CHARACTERISTICS



Typical Downtown Zoning Map

Zoning

Zero lot line" development
Virtually all non-industrial uses permitted
No on-site parking needed

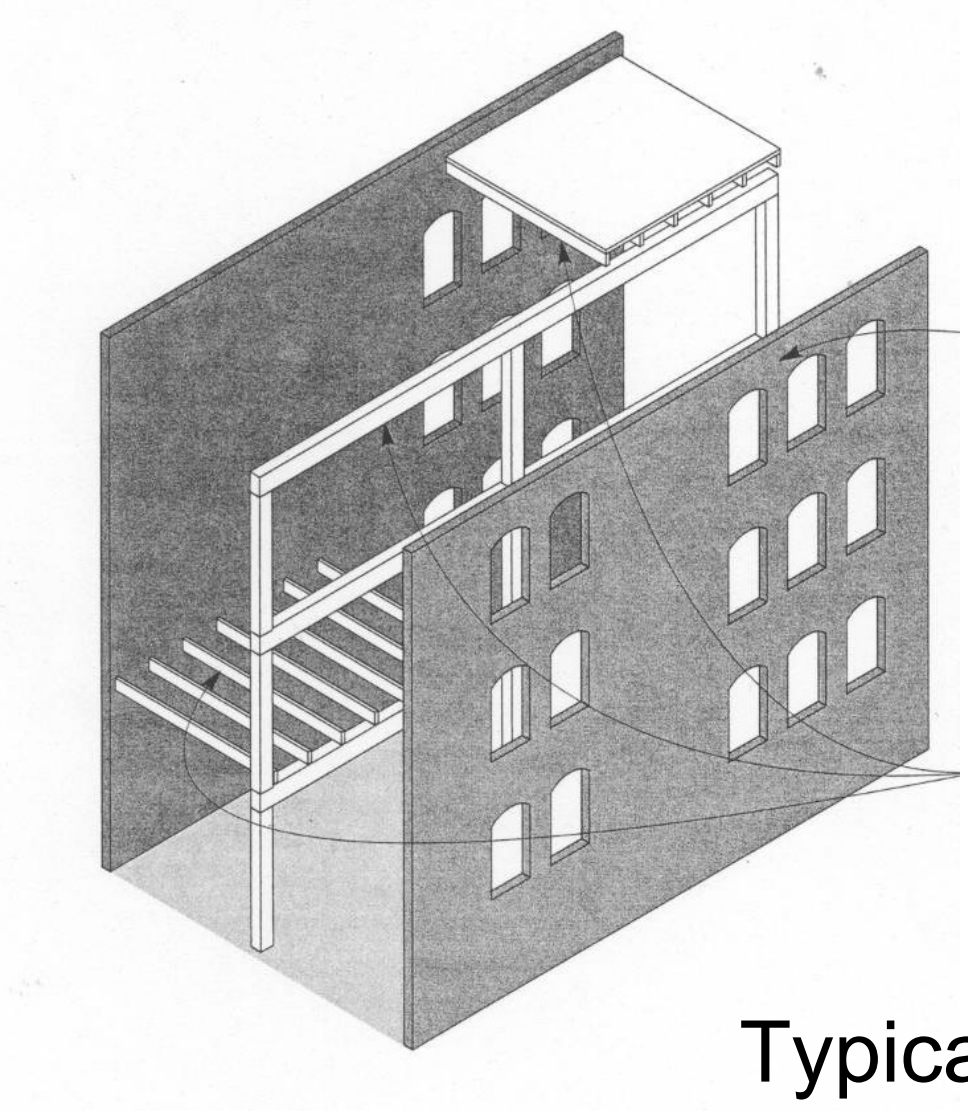
Parking

Always desired, not required
Small projects don't generate much demand
Downtown residents don't always work downtown
Higher demand for higher priced units and condos
City permit process for downtown residents

BUILDING CHARACTERSTICS

- Size
  - Area
  - Height, 2 story or 3 story +
- Construction type (from building code)
- Structural system (check for adequacy)
- Architectural attributes for bldg. codes
  - Number of exits (2 vs 3 stories)
  - Access to light and ventilation
    - Corner buildings work best

BUILDING CHARACTERISTICS



- CONSTRUCTION TYPE (IBC 2000)
  - Type III (based upon fire resistance of building elements)
    - Exterior walls are noncombustible materials and interior building elements are of any material permitted by this code.

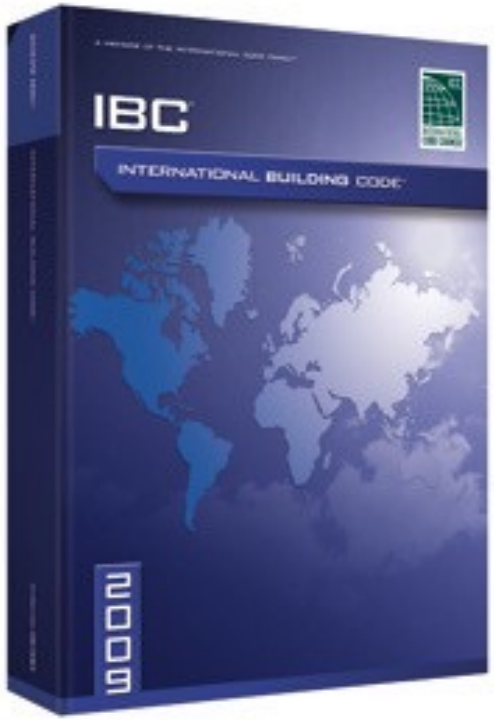
Typical 19th century building

COST FACTORS

- Accessibility - Elevator
- Structural capacity– Floor load
  Life Safety (Building Codes)
  - Sprinklers
  - Extra exit stairs

  Seismic upgrades
- Environmental
  - Asbestos, lead paint

CODES & STANDARDS



Building Codes

National Models, adopted by gov't

American with Disabilities Act (ADA)

Secretary of the Interior's Standards

Code triggers based upon work and/or funding source

Ex: HUD funding and lead paint

Know your local code officials

BUILDING CODES ON MAIN STREET

Council Grove KS

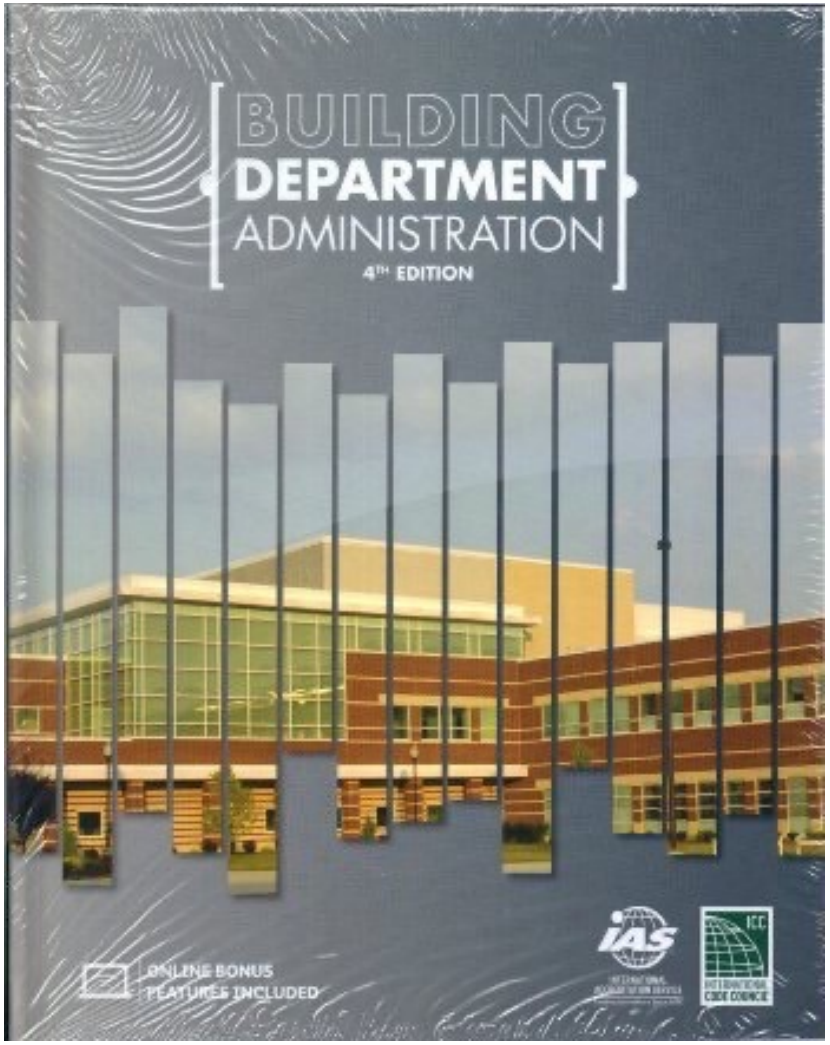
ASSOCIATION FOR PRESERVATION TECHNOLOGY

Main Street Codes Task Force

www.apti.org

Future support materials coming.

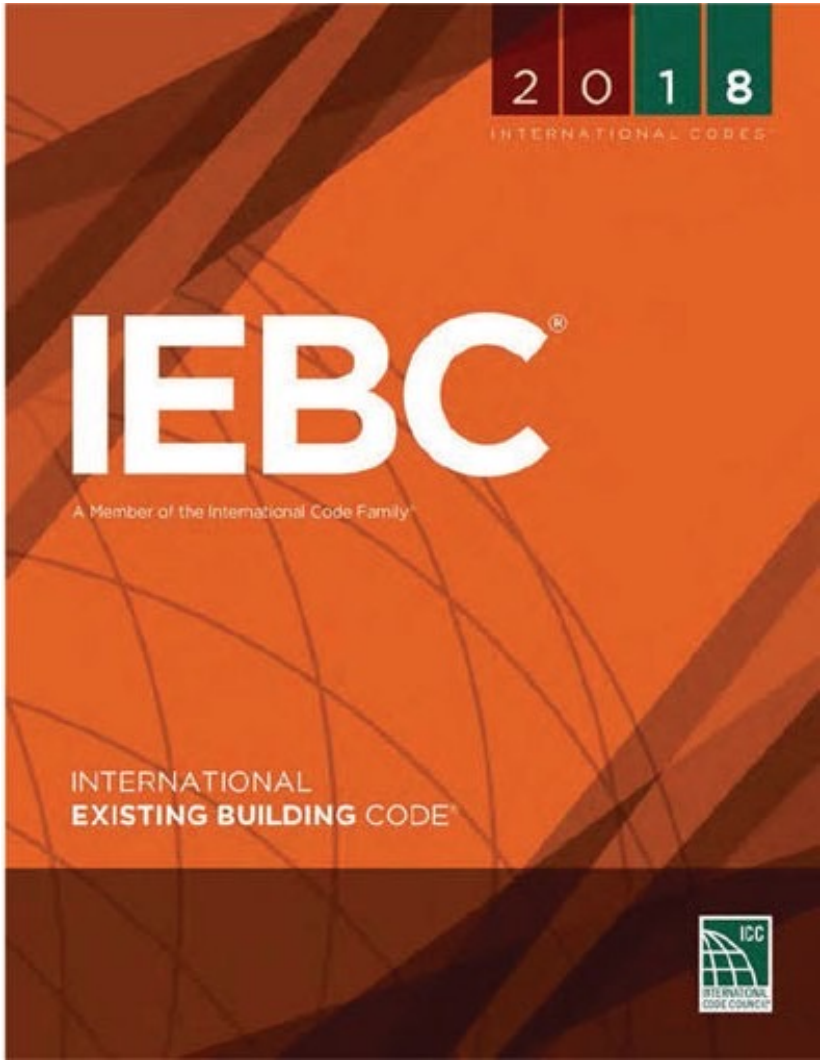
Building Department Administration



"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 4th Edition, 2012

EXISTING BUILDING CODE



Three Code Paths

Prescriptive

Work Area

- Repairs
- Alteration 1
- Alteration 2
- Alternation 3
- Change of Use

Performance

Has your community adopted this code?

BUILDING OCCUPANCY

- Current use (zoning classification)
  - First floor
  - Upper floors

  Historic use (city directory, Sanborn map)
  - First floor
  - Upper floors

  Vacant (last known legal use)

  Kitchen and bath indicate residential use

  * Identified historic use (California)

R BUILDING OCCUPANCY IBC 2018

R-1. Hotels, Motels, Boarding houses (10+), Congregate living (10+)

R-2. Apartments

Congregate living facilities with more than 16 occupants

Boarding houses (non transient)

Convents

Dormitories

Fraternities and Sororities

Monasteries

Hotels (non transient)

Live/work unit Motels (non transient)

Vacation timeshare properties

R-3. Buildings with no more than two dwelling units

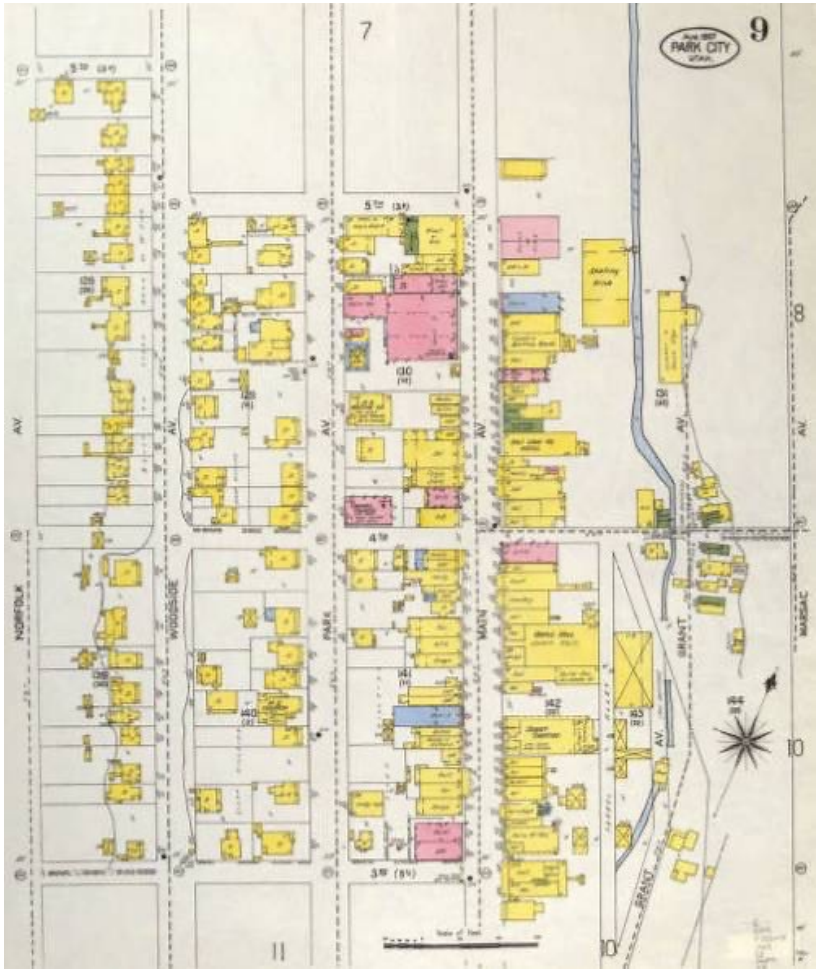
Congregate facilities (non transient) with 16 or fewer occupants

Lodging houses with five or fewer guest rooms (B&B)

R-4. Residential facilities with 24 hr staff care, 16 or fewer

HISTORIC USE

- Sanborn fire insurance maps are a valuable tool to evaluate a buildings original fire safety design attributes.
- City directories



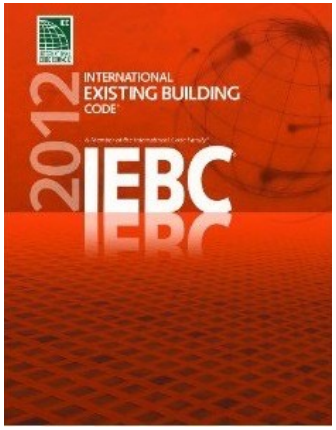
Sanborn maps available locally and online

HISTORIC USE - Residential

8-2302.1. Existing use. The use or character of occupancy of a qualified historical building or property, or portion therof, shall be permitted to continue in use regardless of any period of time in which it may have remained unoccupied or in other uses, provides such building or property is otherwise conforms to all applicable requirements of the CHBC.

Amend your code to add this provision

STRUCTURAL CAPACITY



STRUCTURE (IBC 2000)

Residential 40 psf.

Stairs and exits 100 psf.

- One & two-family dwelling 40 psf.

– Office 50 psf., Corridor above 1st fl. 80 psf.

  – Lobbies and first floor corridor 100 psf.

– Original design (archaic materials)

– Condition assessment

Most building meet residential loading
Industrial buildings exceed most loads

CODES – FIRE SAFETY

- Fire Districts - Exterior Masonry Walls
- Compartmentation (time rating factors)
- **Fire Detection and Alarms**
- Fire Suppression (sprinklers)
- Exits (number and travel distance)

CODES – FIRE SAFETY

Whole Building Alarm System

Wireless Detectors

Pull Station

FIRE SAFETY & SPRINKLERS

Always desired

When are they Required?

- Change of Use as a trigger
- Level of Alteration

Commercial vs Residential systems

Who is the decision maker?

- Building Code official
- Fire Department
- Fire protection engineer

Making Buildings Safer Preserving Authenticity

"demonstrating that compliance with provisions would threaten, degrade or destroy the historic form, fabric or function of the building"

International Energy Conservation Code, 2021

"Don't make the perfect the enemy of the good."

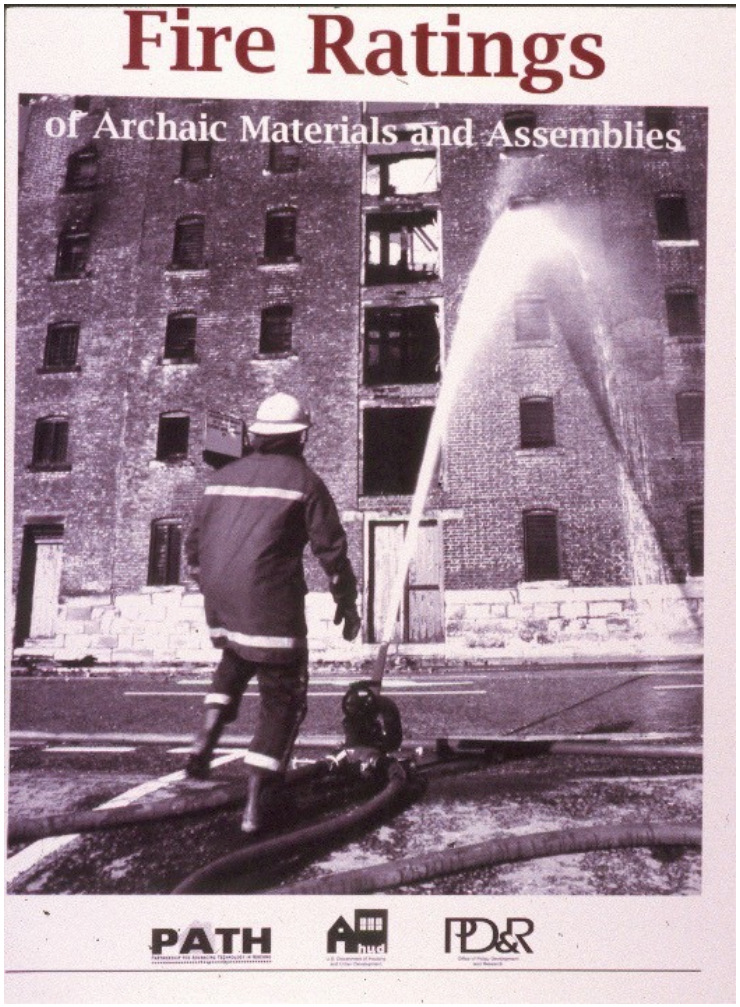
Voltaire

CODES AND TIN CEIINGS

An archaic historic material with a 15-minute fire rating

FIRE RATINGS OLD MATERIALS

- Fire resistance ratings systems for building materials were the next step in the evolution of fire safety. Many historic and archaic materials were built before the modern rating systems were established.
- IEBC Resource A

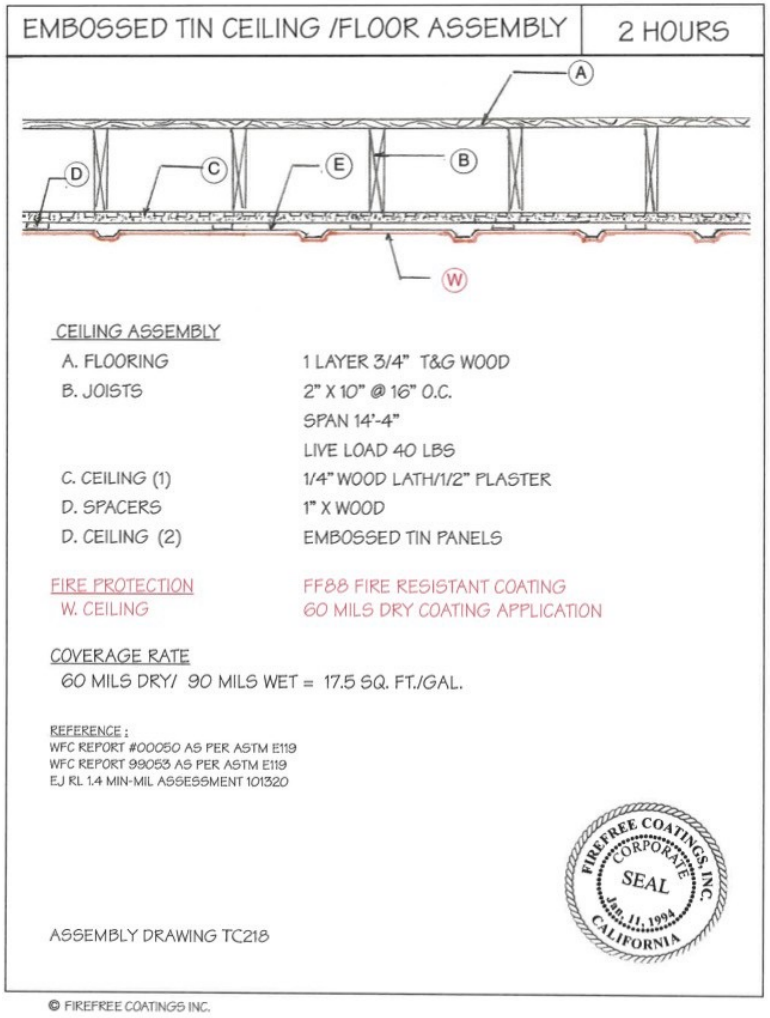


www.huduser.org/portal/publications/destech/fire.html

CODE – SPRINKLERS

- IEBC Historic Buildings
- 1005.4 Occupancy separation
  - Occupancy separation of one hour omitted for buildings with approved sprinkler system throughout.

TIN CEILING 2 HR RATING



EMBOSSED TIN CEILING /FLOOR ASSEMBLY | 2 HOURS

CEILING ASSEMBLY

A. FLOORING	1 LAYER 3/4" T&G WOOD
B. JOISTS	2" X 10" @ 16" O.C. SPAN 14'-4" LIVE LOAD 40 LBS
C. CEILING (1)	1/4" WOOD LATH/1/2" PLASTER
D. SPACERS	1" X WOOD
D. CEILING (2)	EMBOSSED TIN PANELS
FIRE PROTECTION W. CEILING	FF88 FIRE RESISTANT COATING 60 MILS DRY COATING APPLICATION

COVERAGE RATE

60 MILS DRY/ 90 MILS WET = 17.5 SQ. FT./GAL.

REFERENCE :
WFC REPORT #00050 AS PER ASTM E119
WFC REPORT 99053 AS PER ASTM E119
EJ RL 1.4 MIN-MIL ASSESSMENT 101320

FIREFREE COATINGS, INC. CORPORATE SEAL Jan. 11, 1994 CALIFORNIA

ASSEMBLY DRAWING TC218

1. Remove and reinstall over a new drywall
2. Use an intumescent coating
3. Increase rating on second floor
4. Install insulation between joists

www.firefree.com/assembliesdrawings.php#WoodFloorCeiling2Hr

PERFORMANCE COMPLIANCE

- IEBC – Chapter 13
  - Method of quantifying safety improvement
  - Less prescriptive
  - Requires written report by a design professional
- The role of the architect
- The role of the code official

PERFORMANCE COMPLIANCE

SAFETY PARAMETERS	FIRE SAFETY (FS)	MEANS OF EGRESS (ME)	GENERAL SAFETY (GS)
1301.6.1 Building Height 1301.6.2 Building Area 1301.6.3 Compartmentation			
1301.6.4 Tenant and Dwelling Unit Separations 1301.6.5 Corridor Walls 1301.6.6 Vertical Openings			
1301.6.7 HVAC Systems 1301.6.8 Automatic Fire Detection 1301.6.9 Fire Alarm System			
1301.6.10 Smoke control 1301.6.11 Means of Egress 1301.6.12 Dead ends	* * * * * * * * * * * *		
1301.6.13 Maximum Exit Access Travel Distance 1301.6.14 Elevator Control 1301.6.15 Means of Egress Emergency Lighting	* * * * * * * *		
3412.6.16 Mixed Occupancies 3412.6.17 Automatic Sprinklers 3412.6.18 Standpipes 3412.6.19 Incidental Accessory Occupancy		* * * * ÷ 2 =	
Building score — total value			

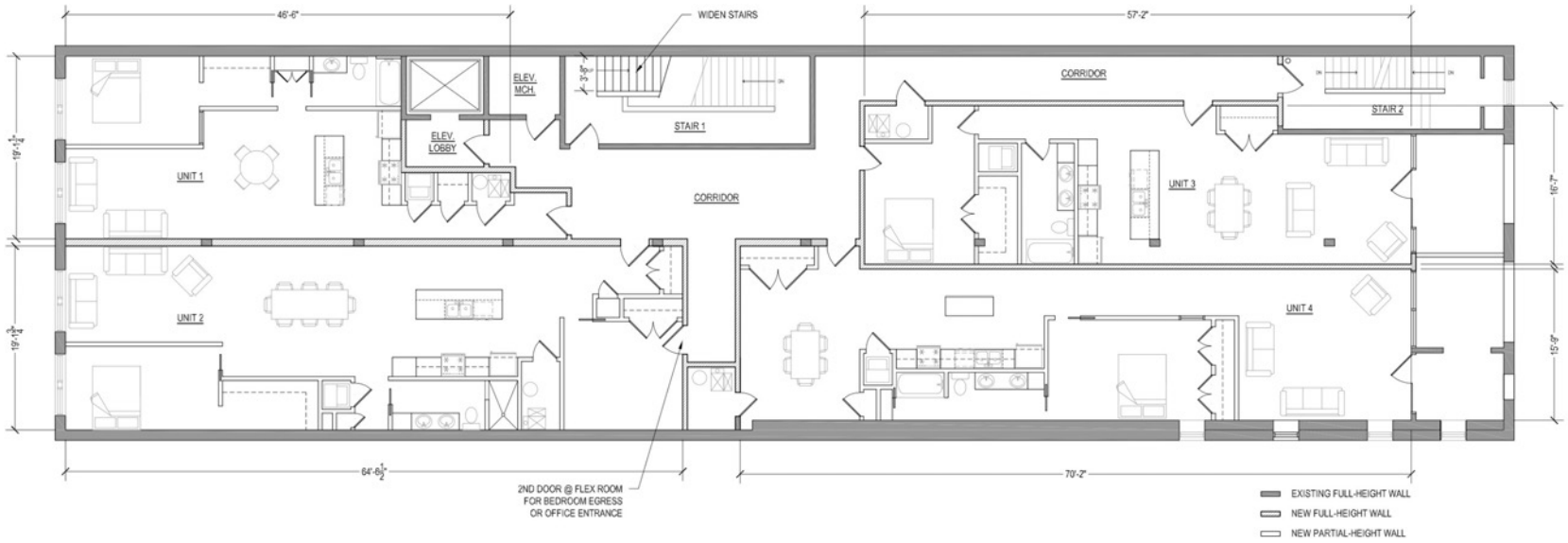
* * * *No applicable value to be inserted.

EGRESS REQUIREMENTS

Three-story buildings require two means of egress from the third floor. Exits must have a direct connection to a public right-of-way.

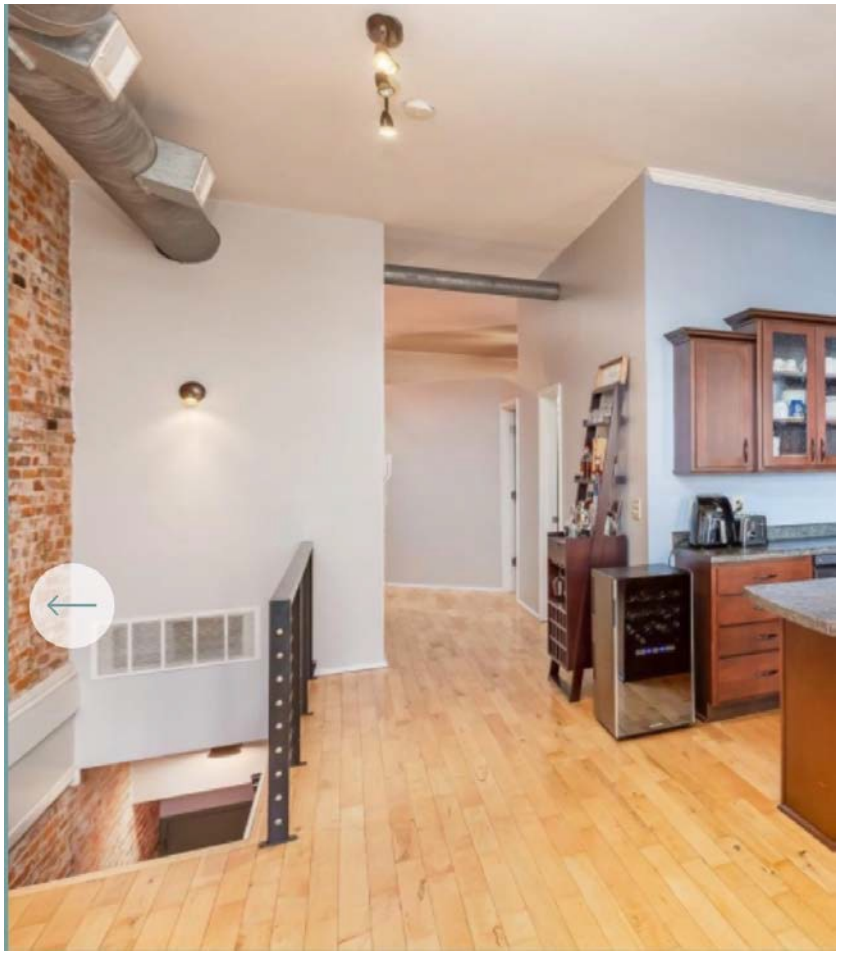
EGRESS REQUIREMENTS

Two-story, single exit
permitted for up to 4 units
Travel distance of 75 feet



This building has a length of 120 ft, therefore two stairs.

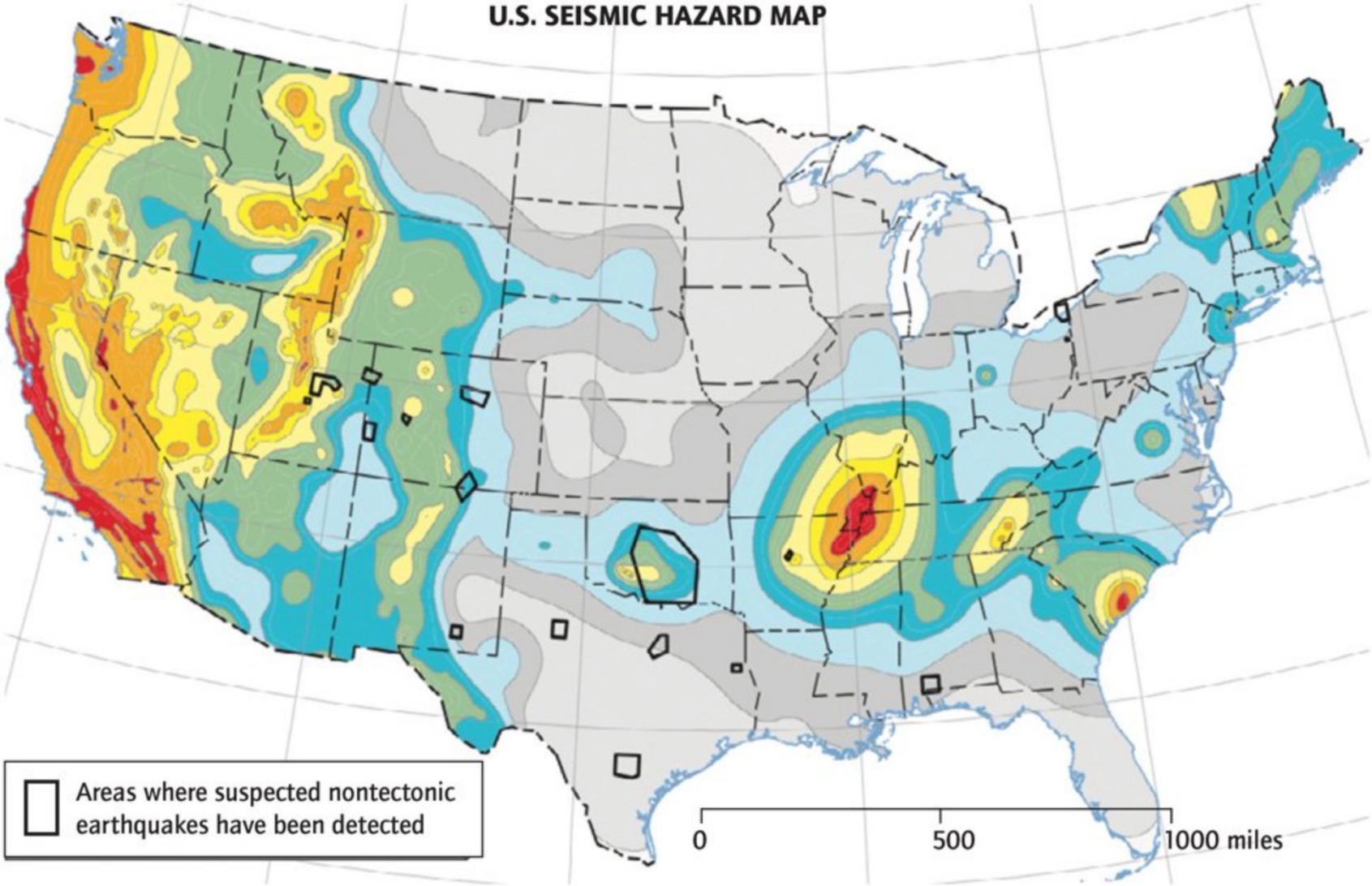
THREE FLOORS, ONE EXIT?



Third floor unit has entry foyer on the second floor (duplex)
Rear balcony as an “area of refuge”

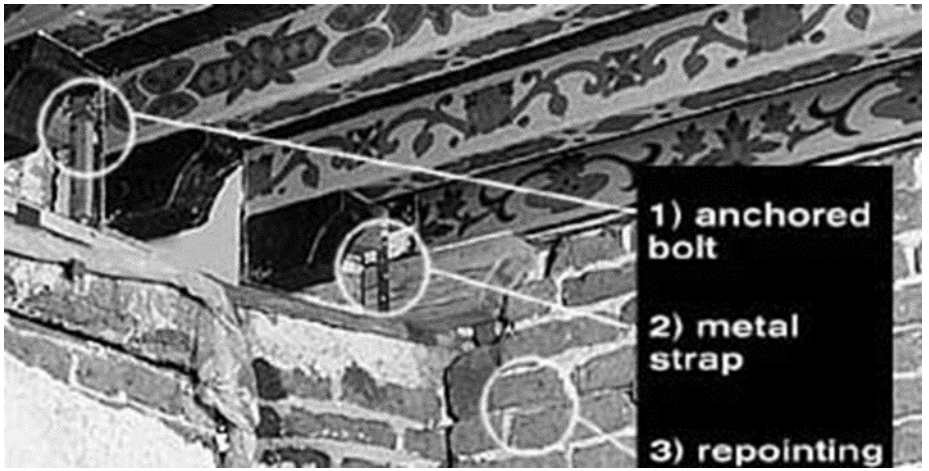
Area of refuge balcony added to the rear

SEISMIC HAZARD MAP



SEISMIC RETROFIT

Structural System Trigger
Expenditures based upon assessed value



Preservation Brief 41
Seismic Retrofit of Historic Buildings

BUILDING ACCESSIBILITY
The Elevator Question

Americans with Disabilities Act (ADA)
- Applies to public accommodations

Is retroactive starting in 1990
- Readily achievable test (economics)

State Accessibility Codes
- Building Permit “trigger”
- There are lots of building code provisions, even when you don’t install an elevator.

BUILDING ACCESSIBILITY ADA

Elevator **not** required for buildings less than three stories if:

Under 3,000 sq. ft. except for:

Shopping center

Medical office

Transit Facilities

ADA does not apply to housing

BUILDING ACCESSIBILITY

- Fair Housing Act (1991)

  Does not apply to older buildings.
  The Act requires all newly constructed multi-family dwellings of four or more units intended for first occupancy after March 13, 1991, to have certain features: an accessible entrance on an accessible route, accessible common and public use areas, doors sufficiently wide to accommodate wheelchairs, accessible routes into and through each dwelling…

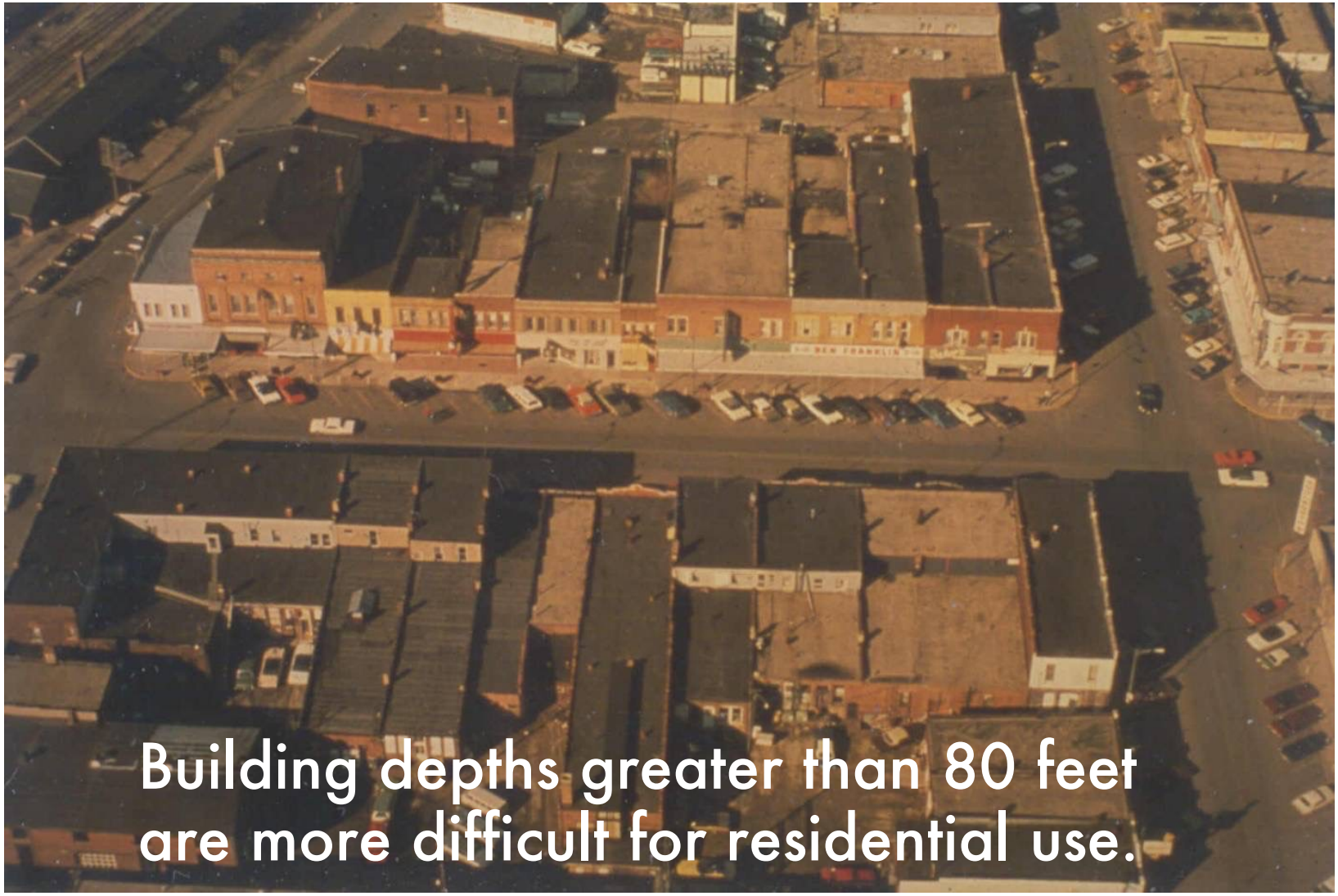
BUILDING ACCESSIBILITY

Elevator needed for **marketability** when:

More than three stories
All age marketing
Higher market potential
More than twenty units – ICC
More than ten units – test economics

Two story buildings don't need an elevator to be competitive.

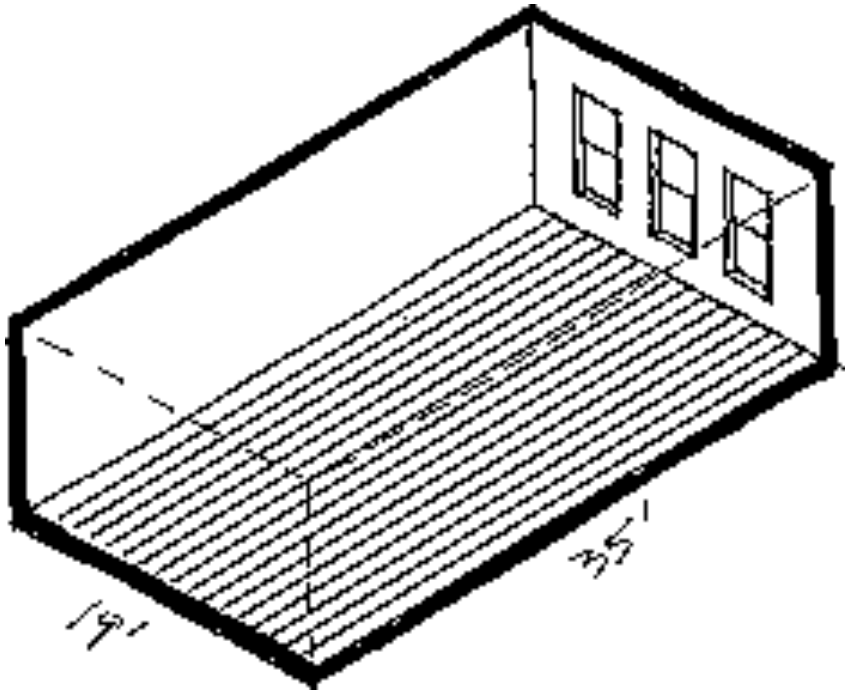
LIGHT & VENTILATION



LIGHT & VENTILATION

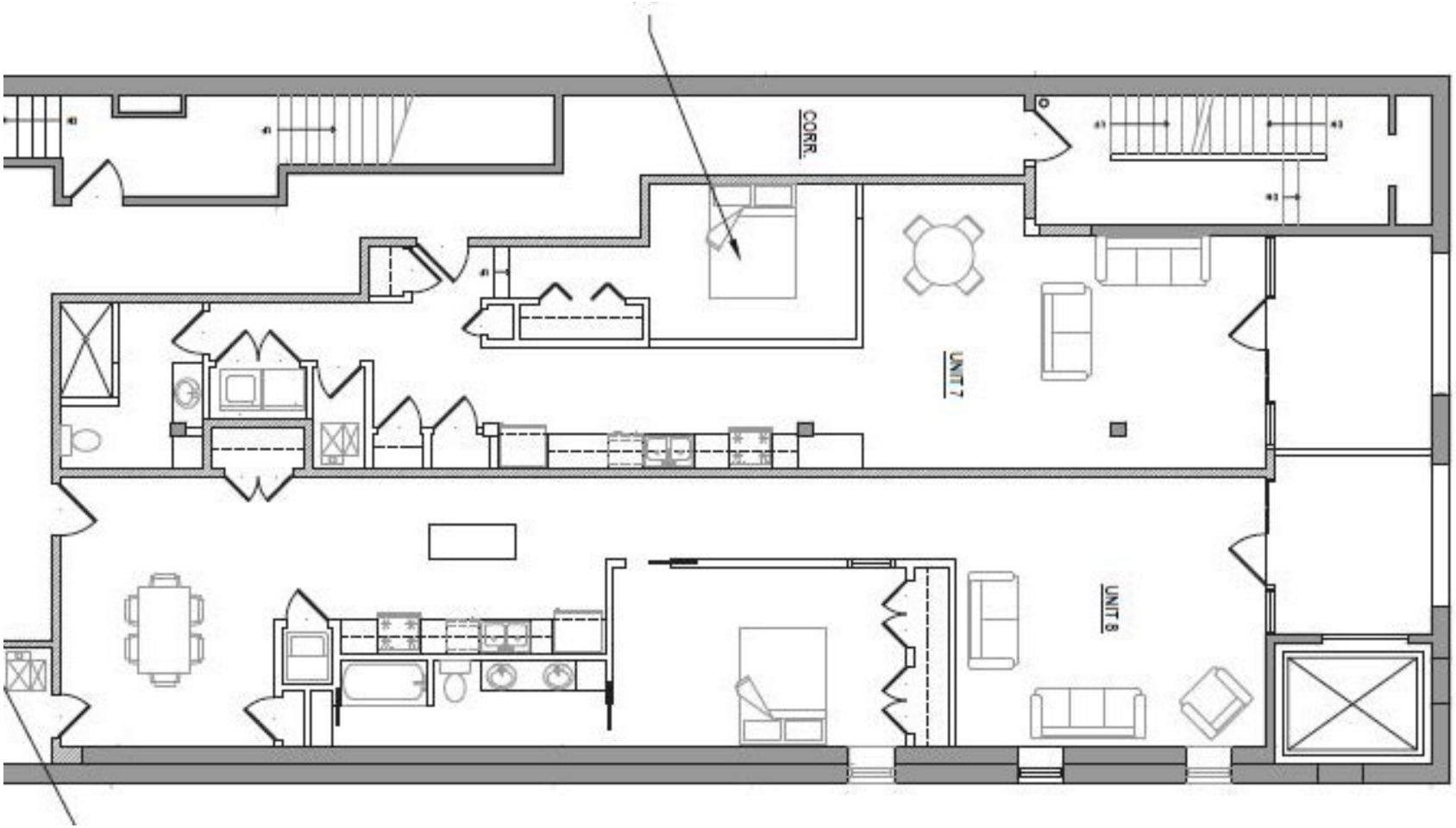
Natural light requirement – 8% of floor area
Natural ventilation requirement – 4% of floor area

EXAMPLE
WINDOW AREA
3 ' X 6' = 18 sq. ft. per window
x 3 windows
54 sq. ft. of window glazing
27 sq. ft. of vent opening
MAXIMUM ROOM SIZE
54 sq. ft. is 8 % of
675 sq. ft.
ROOM DIMENSION
19' wide x 35' long



Building with sprinklers permit bedrooms without windows

LIGHT & VENTILATION



BR Wall open above for “borrowed light and vent.”
Note: This building is fully sprinklered.

Unit with “borrowed light” bedroom

Bedrooms with ”borrowed light”

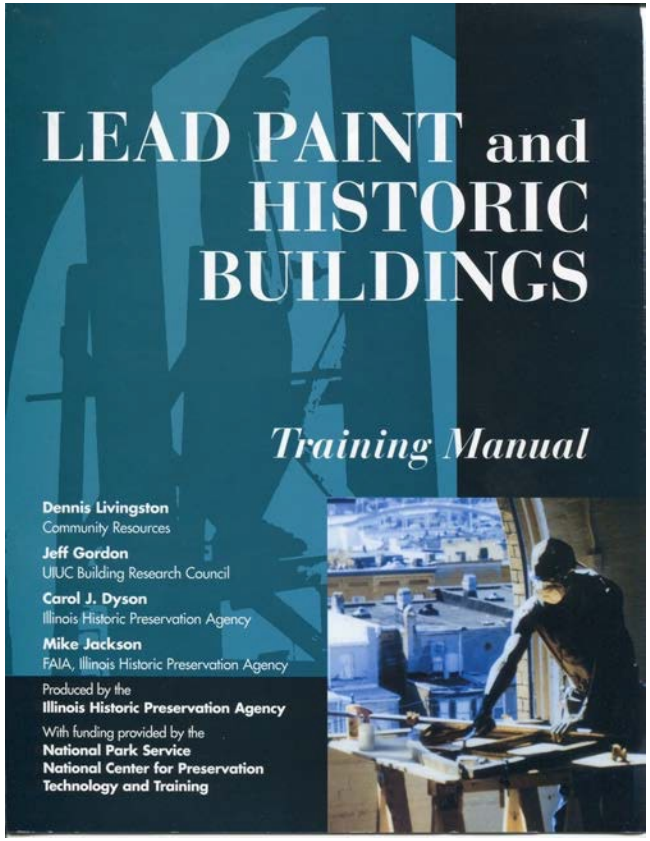
Tracy Lofts, Billings MT. High Plains Architects
Fully sprinklered building

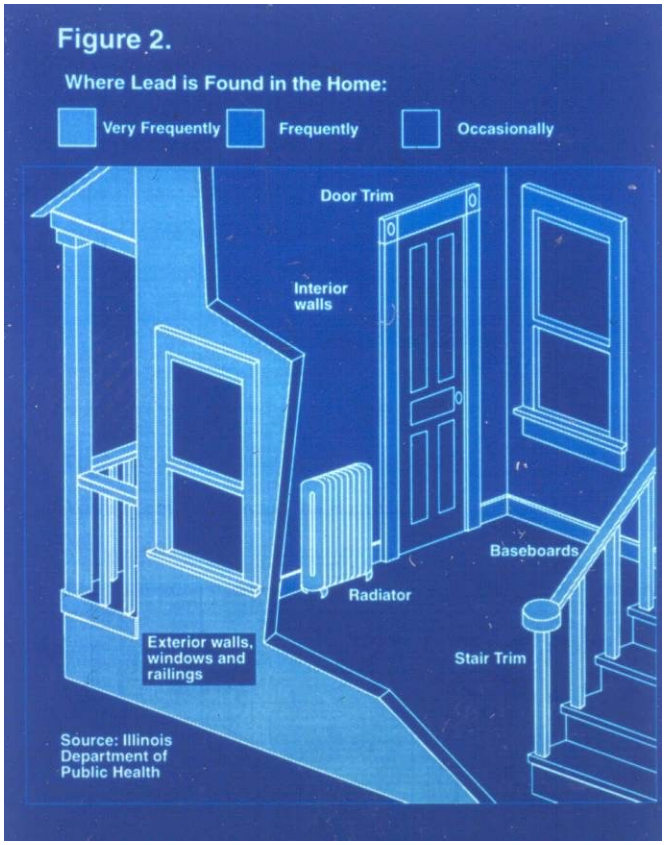
ENVIRONMENTAL ASSESSMENT

- Asbestos
- Lead Paint
- Underground storage tanks
- Other
  - Prior industrial use (Sanborn map, history)
  - Bird droppings
  - Mold

LEAD PAINT

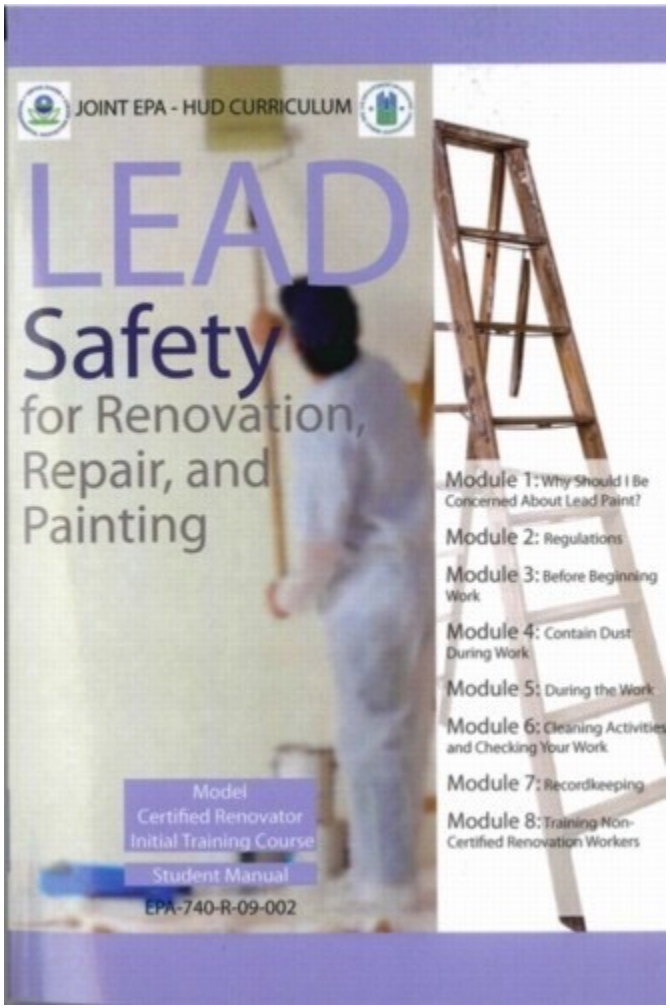
- LEAD PAINT and Historic Buildings





https://www2.illinois.gov/dnrhistoric/preserve/pages/leadpaint.aspx

EPA
Renovation Repair & Painting



Residential units in pre-1978 buildings

Lead-safe work practices
Contractor certification

HISTORIC CLASSIFICATION

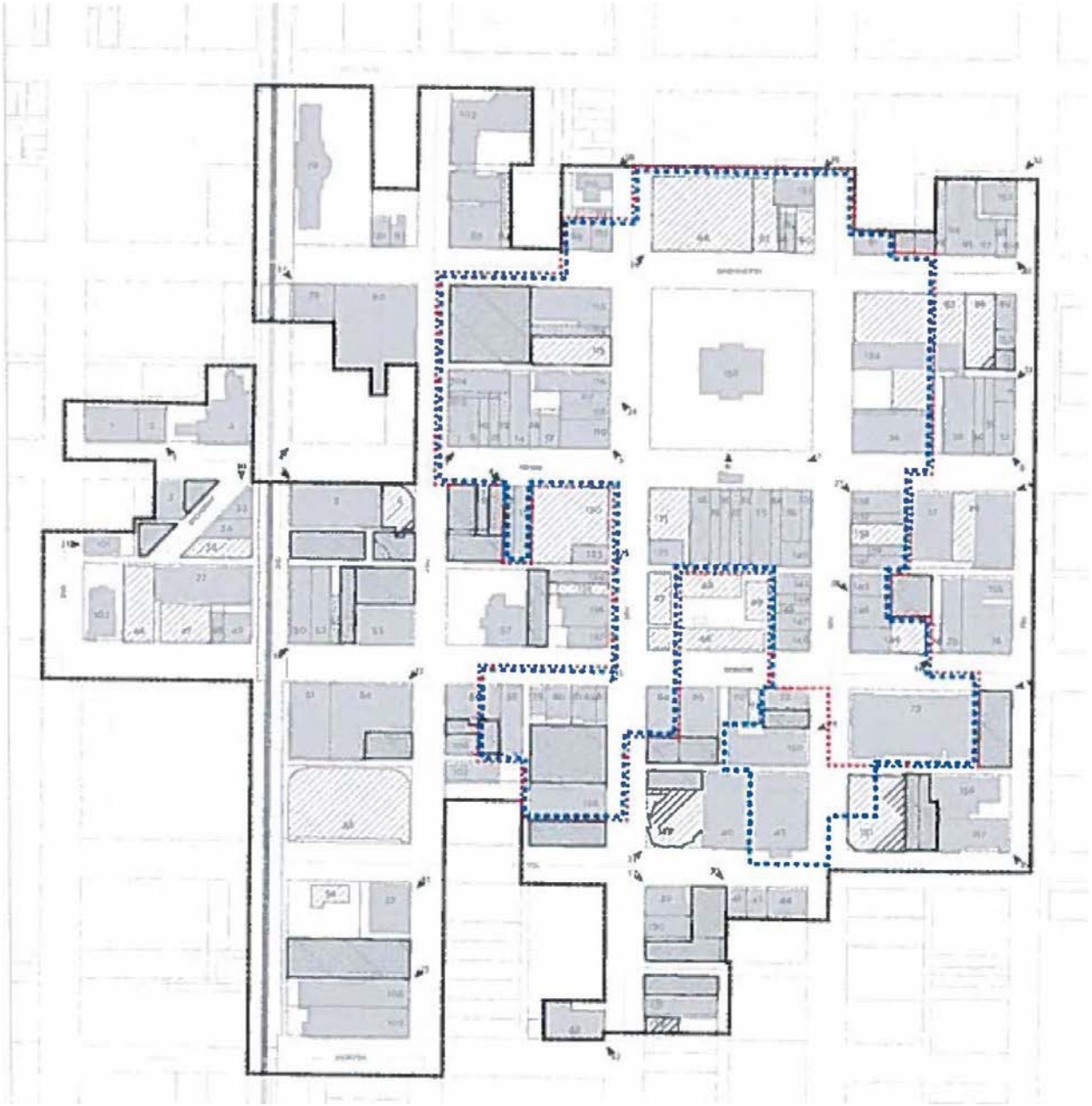
- Historic designation status:
  - National Register of Historic Places
  - Local Landmark
    - Individual listing or
  - Contributing building to a district
  - Eligibility for designation (50 years +)

HISTORIC BUIDING & $$$s

- Federal Tax Credits for National Register properties is the largest historic preservation program in the country
- State Tax Credits are really working
- Tax Credits work like a rebate
- Equal to 20% of qualified rehab expenses
- Contact SHPO
- Owner should consult accountant.
- IRS Restrictions apply

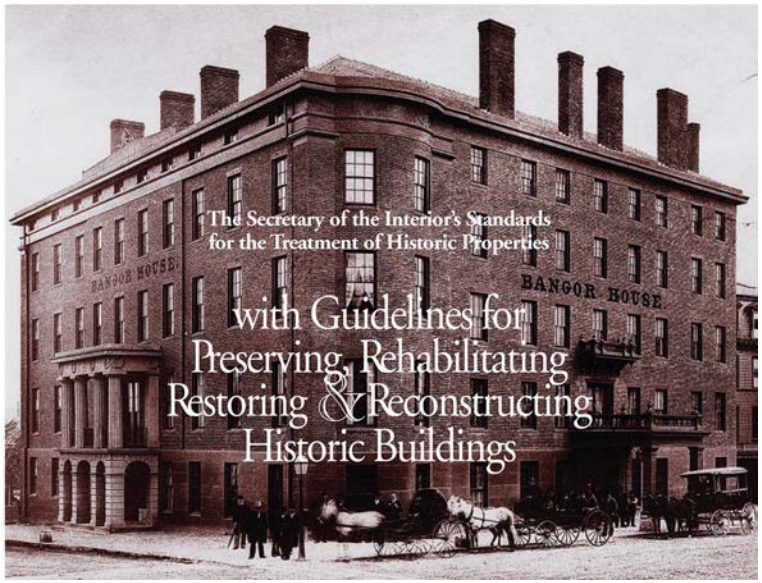
Springfield Downtown Historic District

Original Listing Plus additions



HISTORIC DESIGN REVIEW

- Secretary of the Interior's Standards for Rehabilitation (Historic Building Code)
- Local commissions review of exterior



SHPO review if project has state/federal funding, permits or licensing

SHPO review of entire building.

ARCHITECTURAL FEATURES

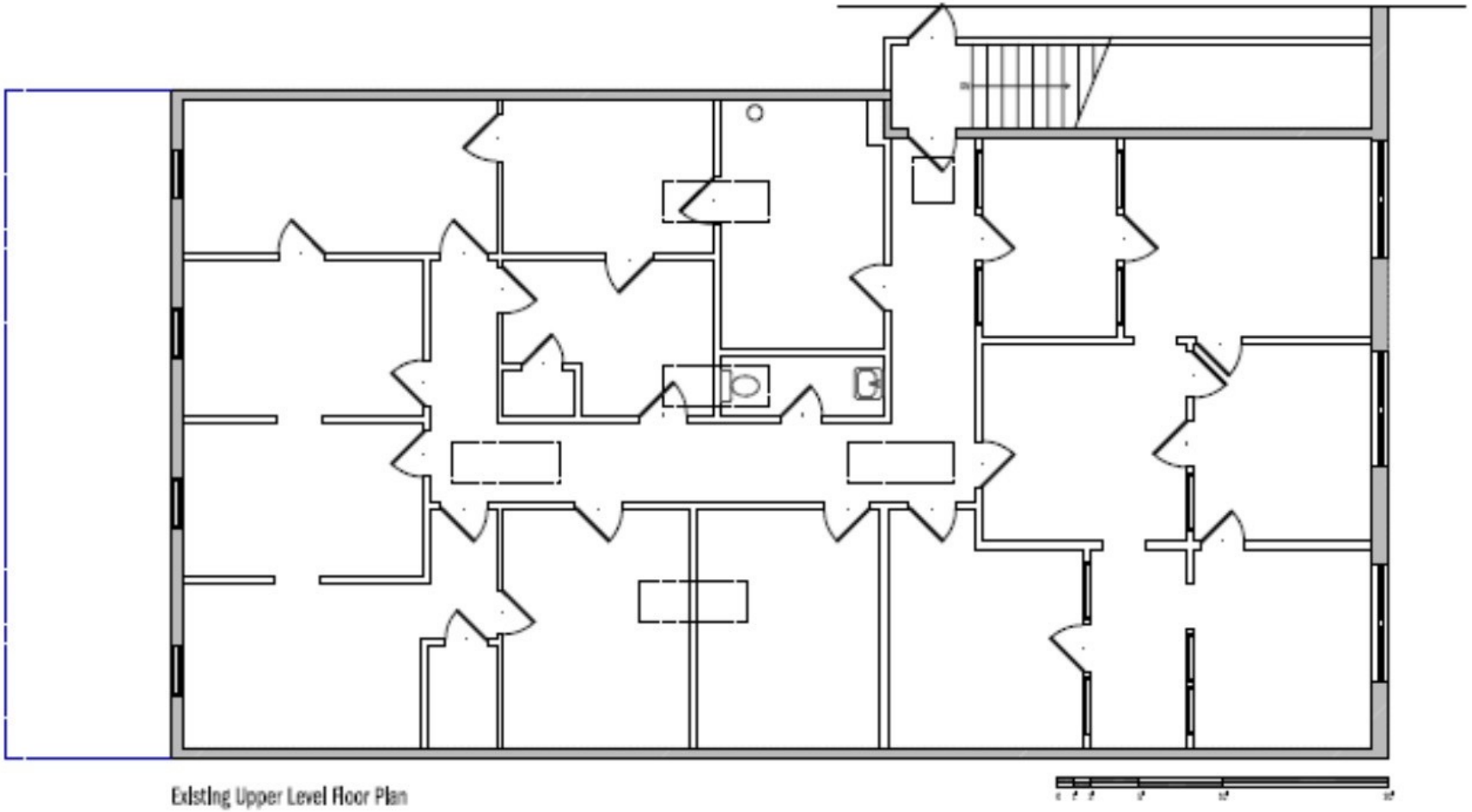
- Architectural elements
- Fireplaces
- High ceilings

ARCHITECTURAL TREATMENT

- Exposing the brick in historically finished spaces does not meet Preservation Standards.

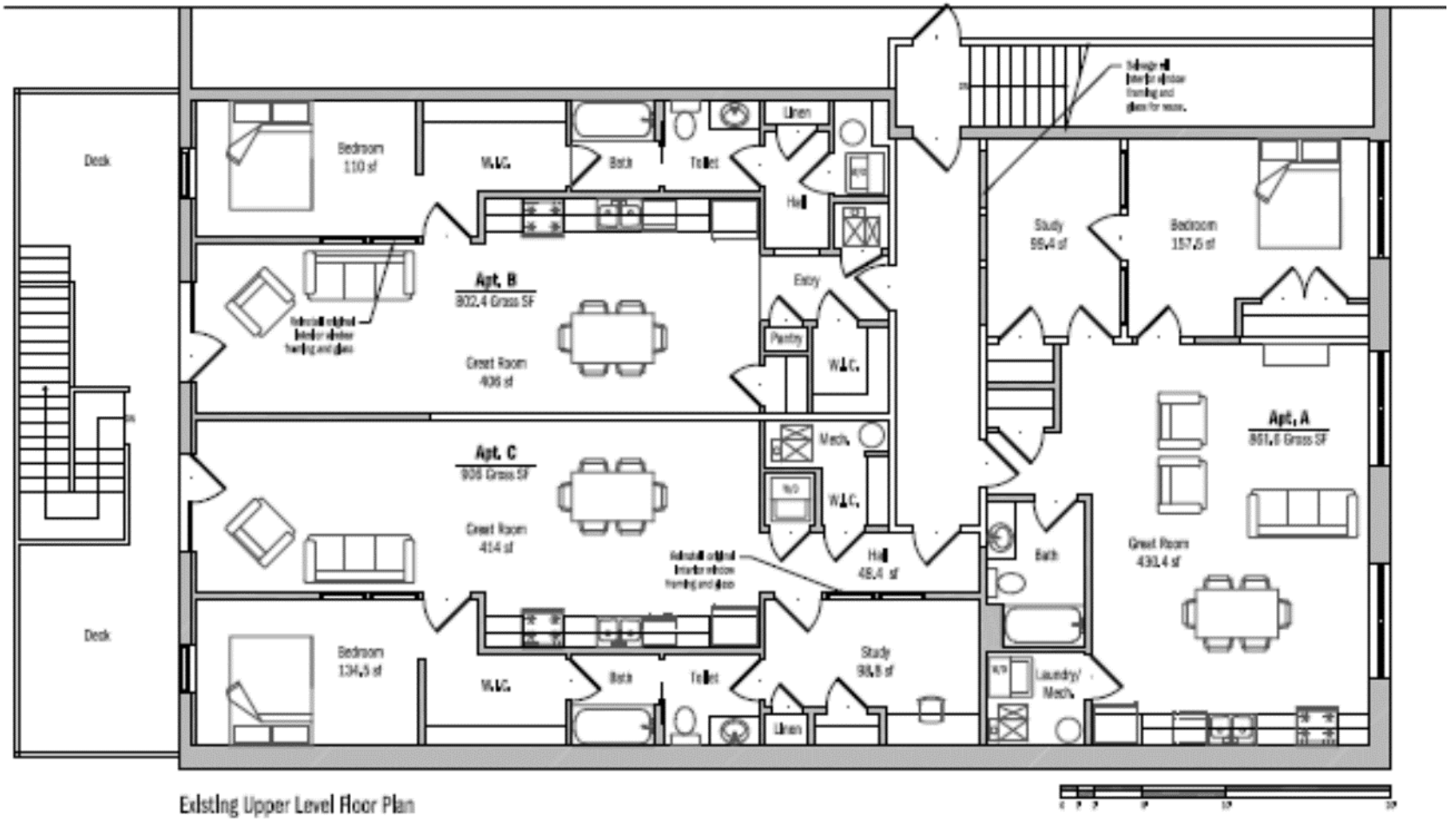
HISTORIC INTERIOR

OFFICE BLDG CONVERSION



Existing Plan

OPEN PLAN CONVERSION



Existing Upper Level Floor Plan

Proposed Plan 3 units plus second stair

LIFE CYCLE ASSESSMENT LCA

Quantifying the Value of Building Reuse
National Trust for Historic Preservation
Preservation Green Lab

LIFE CYCLE ASSESSMENT LCA

Table 12. Number of Years Required for New Buildings to Overcome Climate Change Impacts from Construction Process

According to this study, it takes 10 to 80 years for a new building that is 30 percent more efficient than an average-performing existing building to overcome, through efficient operations, the negative climate change impacts related to construction. This table illustrates the number of years required for different energy efficient, new buildings to overcome impacts.

Building Type	Chicago	Portland
Urban Village Mixed Use	42 years	80 years
Single-Family Residential	38 years	50 years
Commercial Office	25 years	42 years
Warehouse-to-Office Conversion	12 years	19 years
Multifamily Residential	16 years	20 years
Elementary School	10 years	16 years
Warehouse-to-Residential Conversion*	Never	Never

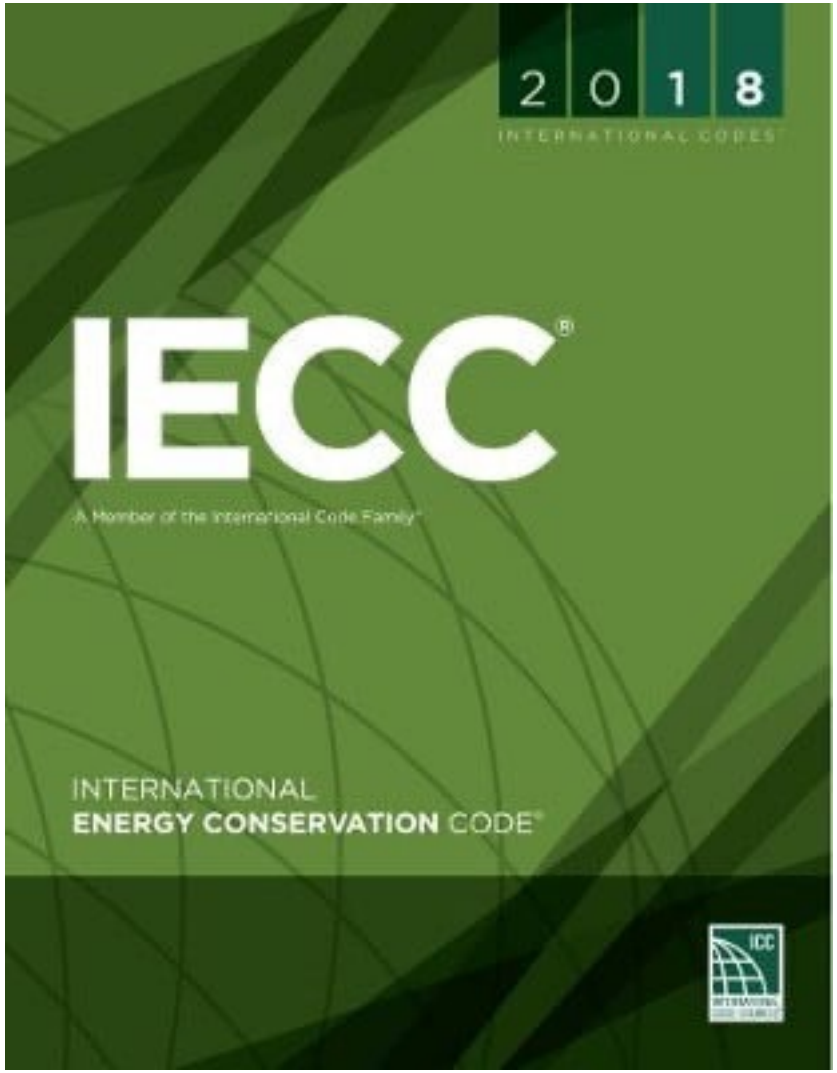
Main Street Mixed Use

42 – 80 Years

Carbon Avoided Retrofit Calculator

https://architecture2030.org/caretool/

ENERGY CONSERVATION



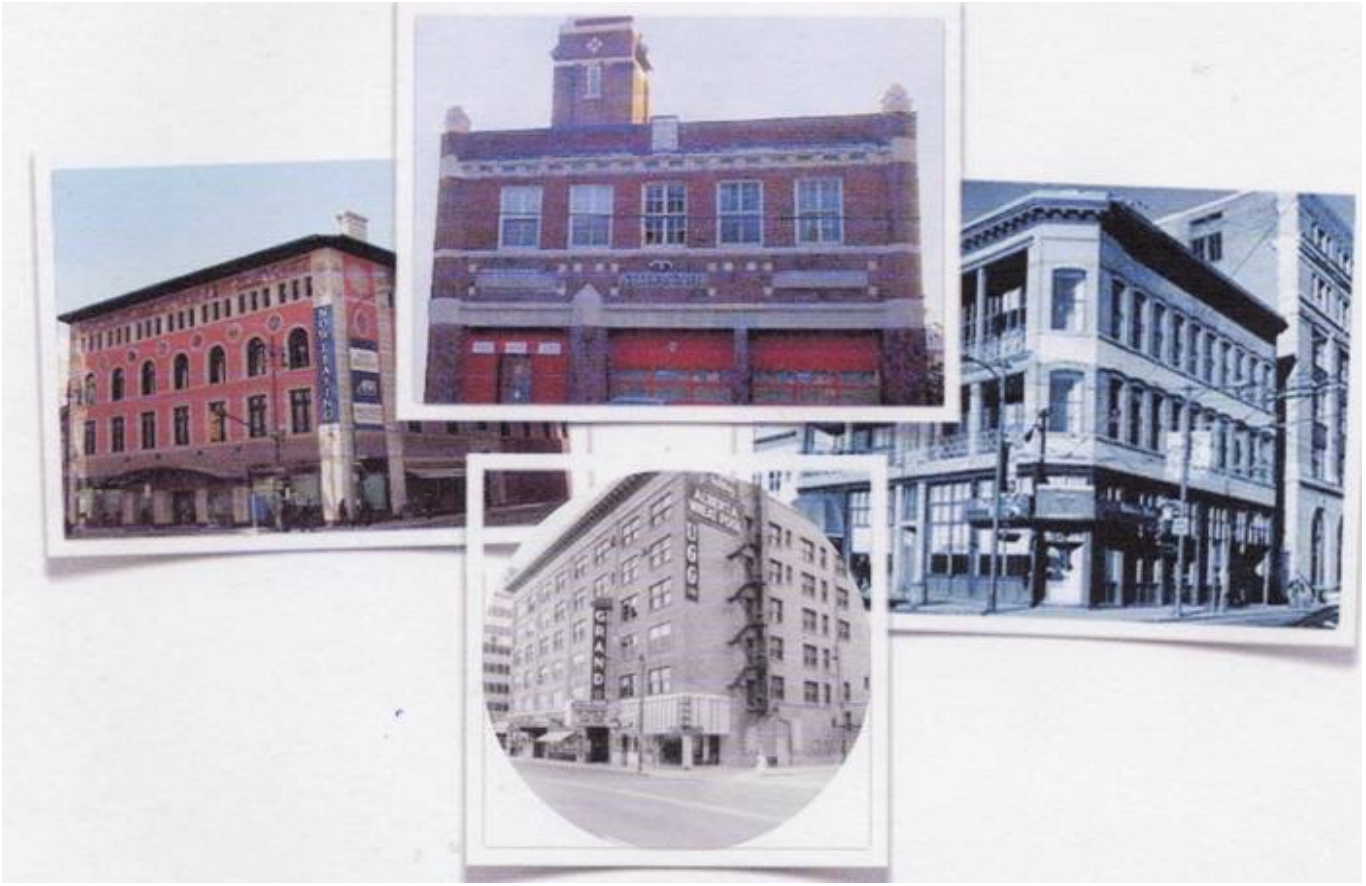
Energy Conservation codes are getting more stringent.

Higher efficiency equipment is needed.

Energy codes require existing buildings to perform better.
Change of Occupancy trigger

ENERGY EFFICIENCY

Renovated historic buildings are just as energy efficient as new construction.



Parks Canada Study

CREATING ENERGY EFFICIENT MAIN STREETS

MAIN STREET
IOWA
25
QUARTER CENTURY
OF CHANGE

LAKOTA
respect for land and community

www.iowaeconomicdevelopment.com/userdocs/documents/ieda/CreatingEnergyEfficientMainStreets.pdf

REACHING NET ZERO

Eight inches of insulation inside the brick walls.

OPPORTUNITIES AWAIT

Council Grove KS

THANK YOU