

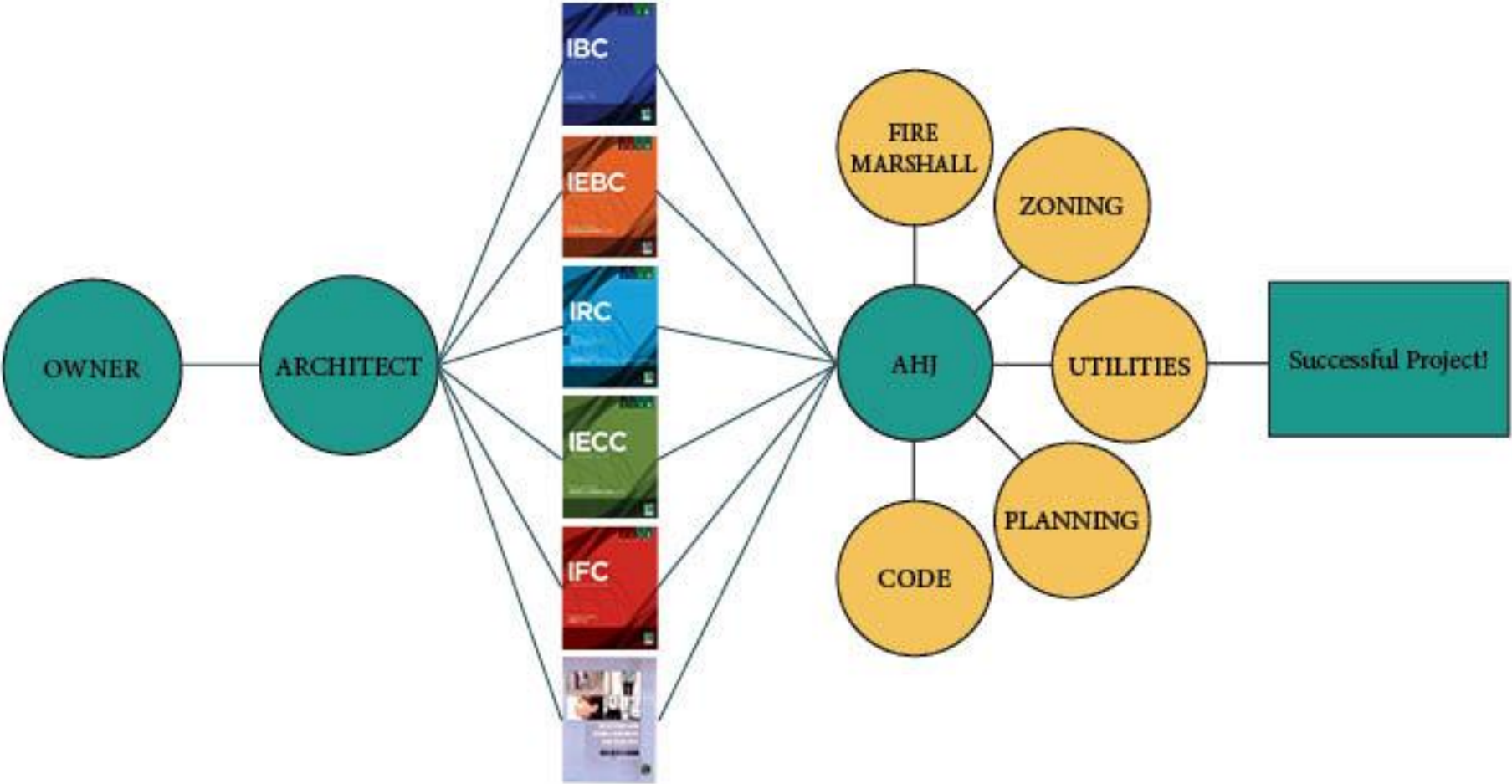
Building Code and Historic Buildings

An Overview

Introduction

Where do we start?

PROCESS + PARTIES



CODE COMPLIANCE METHODS

Know your options

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3 Model Codes

-The International Code Council (ICC) allows “design professional” to choose code path

1. IRC - International Residential Code: 1-2 family dwellings, 3 stories max, separate means of egress.
 - a. Appendix J addresses rehabilitation (but must be separately adopted)
2. IBC - International Building Code: all non-IRC occupancies, does not account for historic/rehabilitation
3. IEBC - International Existing Building Code: all occupancies, contains historic building provisions



IEBC - 3 Compliance Paths

- IEBC is updated every 3 years - need to check which version has been adopted by your municipality
- Chapter 3 applies to all paths (includes high level structural, accessibility, fire safety, etc.)

1. Prescriptive Method = Ch. 5
2. Work Area Method = Chs. 6-12
3. Performance Method = Ch. 13

301.3 Alteration, addition or change of occupancy.

The *alteration, addition or change of occupancy* of all *existing buildings* shall comply with one of the methods listed in Section 301.3.1, 301.3.2 or 301.3.3 as selected by the applicant. Sections 301.3.1 through 301.3.3 shall not be applied in combination with each other.

Exception: Subject to the approval of the *code official*, *alterations* complying with the laws in existence at the time the building or the affected portion of the building was built shall be considered in compliance with the provisions of this code. New structural members added as part of the *alteration* shall comply with the *International Building Code*. This exception shall not apply to alterations that constitute substantial improvement in *flood hazard areas*, which shall comply with Section 503.2, 701.3 or 1301.3.3. This exception shall not apply to the structural provisions of Chapter 5 or to the structural provisions of Sections 706, 806 and 906.

301.3.1 Prescriptive compliance method.

Alterations, additions and changes of occupancy complying with Chapter 5 of this code in buildings complying with the *International Fire Code* shall be considered in compliance with the provisions of this code.

301.3.2 Work area compliance method.

Alterations, additions and changes of occupancy complying with the applicable requirements of Chapters 6 through 12 of this code shall be considered in compliance with the provisions of this code.

301.3.3 Performance compliance method.

Alterations, additions and changes of occupancy complying with Chapter 13 of this code shall be considered in compliance with the provisions of this code.

Prescriptive Method - IEBC Chapter 5

- Most traditional
- Requires judgement by “AHJ” (authority having jurisdiction -code official)

SECTION 507 HISTORIC BUILDINGS

507.1 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.

507.2 Life safety hazards. **E**

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

SECTION 506 CHANGE OF OCCUPANCY **E**

506.1 Compliance. **E**

A *change of occupancy* shall not be made in any building unless that building is made to comply with the requirements of the *International Building Code* for the use or occupancy. Changes of occupancy in a building or portion thereof shall be such that the *existing building* is not less complying with the provisions of this code than the *existing building* or structure was prior to the change. Subject to the approval of the building official, changes of occupancy shall be permitted without complying with all of the requirements of this code for the new occupancy, provided that the new occupancy is less hazardous, based on life and fire risk, than the existing occupancy.

Prescriptive Method - IEBC Chapter 5

Pros:

- More flexible than the IBC
- Repairs can be done in-kind with historic buildings unless AHJ deems “distinct life safety hazard”

Cons:

- Building usually has to fully meet the International Fire code (IFC) (more restrictive)
- Change of Occupancy kicks you back to the IBC (more restrictive)
- Applies to whole building, not just work area

Work Area Method - IEBC Chapters 6-12

More flexible than Prescriptive, triggered by scale of work

1. “Repair” (can generally be done in kind): *The reconstruction or renewal of any part of an existing building for the purpose of its maintenance or to correct damage.*
2. Alteration Levels 1, 2, & 3 (requirements from Chapters 7-9)
 - a. Level 1: removal/replacement or covering of existing materials or elements serving same purpose
 - b. Level 2: work area less than 50% of building including door/window changes, space reconfigured, systems/equipment extended
 - c. Level 3: work area exceeds 50% of building
3. Report sometimes required to demonstrate still meeting intent of the code, at discretion of AHJ

**As you move up the Levels, you must also meet code of the previous Levels. For example, Level 2 Alterations have to meet code required by both Level 1 and Level 2 Alterations.

Work Area Method - Alterations Levels 1, 2, 3 Comparison

Section 704 Means of Egress

704.1 General

Alterations shall be done in a manner that maintains the level of protection provided for the means of egress.

Section 805 Means of Egress

805.1 Scope

The requirements of this section shall be limited to *work areas* that include exits or corridors shared by more than one tenant within the *work area* in which Level 2 *alterations* are being performed, and where specified they shall apply throughout the floor on which the *work areas* are located or otherwise beyond the *work area*.

Section 905 Means of Egress

905.1 General

The means of egress shall comply with the requirements of Section 805 except as specifically required in Sections 905.2 and 905.3.

Work Area Method - IEBC Chapters 6-12

4. Change of Occupancy *Classification*
 - a. Change of use can occur within same classification without necessarily triggering additional requirements
 - b. Change of classification will trigger if change increases hazard level

Use	Group	Examples
Assembly	A-1, A-2, A-3, A-4, & A-5	Fixed seating (theater, studios, etc.), food/drink consumption (restaurants, casinos, etc.), worship/rec/etc. (gallery, library, bowling alley, etc.), spectator (area, pool, etc.), & outdoor activities (stadiums, amusement parks, etc.)
Business	B	bank, educational above 12th grade, post office, professional services (dentist, attorney), etc.
Educational	E	6+ people for education up through 12th grade, some day care
Factory & Industrial	F-1 & F-2	Bakeries, clothing, machinery, paper mills, etc.
High Hazard	H-1, H-2, H-3, H-4, & H-5	materials that constitute a hazard in excess of controlled amounts
Institutional	I-1, I-2, I-3, & I-4	some assisted living, some alcohol/drug center, hospitals, jails, etc.
Mercantile	M	stores, markets, fuel-dispensing facilities, etc.
Residential	R-1, R-2, R-3, & R-4	hotels/motels, apartments, some alcohol/drug centers, etc.
Storage	S-1 & S-2	storage of low to moderate hazard items
Utility & Miscellaneous	U	barns, carports/private garages, tanks, etc.

Work Area Method - Change of Occupancy Example

1011.4.1 Means of Egress for Change to a Higher-Hazard Category

Diagram

Where a change of occupancy classification is made to a higher-hazard category (lower number) as shown in Table 1011.4, the means of egress shall comply with the requirements of Chapter 10 of the *International Building Code*.

Exceptions:

1. Stairways shall be enclosed in compliance with the applicable provisions of Section 903.1.
2. Existing stairways including handrails and guards complying with the requirements of Chapter 9 shall be permitted for continued use subject to approval of the *code official*.
3. Any stairway replacing an existing stairway within a space where the pitch or slope cannot be reduced because of existing construction shall not be required to comply with the maximum riser height and minimum tread depth requirements.
4. Existing corridor walls constructed on both sides of wood lath and plaster in good condition or $\frac{1}{2}$ -inch-thick (12.7 mm) gypsum wallboard shall be permitted. Such walls shall either terminate at the underside of a ceiling of equivalent construction or extend to the underside of the floor or roof next above.
5. Existing corridor doorways, transoms and other corridor openings shall comply with the requirements in Sections 805.5.1, 805.5.2 and 805.5.3.
6. Existing dead-end corridors shall comply with the requirements in Section 805.6.
7. An existing operable window with clear opening area not less than 4 square feet (0.38 m²) and minimum opening height and width of 22 inches (559 mm) and 20 inches (508 mm), respectively, shall be accepted as an emergency escape and rescue opening.

1011.4.2 Means of Egress for Change of Use to an Equal or Lower-Hazard Category

Diagram

Where a change of occupancy classification is made to an equal or lesser-hazard category (higher number) as shown in Table 1011.4, existing elements of the means of egress shall comply with the requirements of Section 905 for the new occupancy classification. Newly constructed or configured means of egress shall comply with the requirements of Chapter 10 of the *International Building Code*.

Exception: Any stairway replacing an existing stairway within a space where the pitch or slope cannot be reduced because of existing construction shall not be required to comply with the maximum riser height and minimum tread depth requirements.

TABLE 1011.4

MEANS OF EGRESS HAZARD CATEGORIES

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

Work Area Method - IEBC Chapter 12 historic building “exceptions”

CHAPTER 12 HISTORIC BUILDINGS

User note:

About this chapter: Chapter 12 provides some exceptions from code requirements when the building in question has historic value. The most important criterion for application of this chapter is that the building must be essentially accredited as being of historic significance by a state or local authority after careful review of the historical value of the building. Most, if not all, states have such authorities, as do many local jurisdictions. The agencies with such authority can be located at the state or local government level or through the local chapter of the American Institute of Architects (AIA). Other considerations include the structural condition of the building (i.e., is the building structurally sound), its proposed use, its impact on life safety and how the intent of the code, if not the letter, will be achieved.

1202.1: repairs (mostly) permitted to be done with materials and methods original to construction

1203.3: doorway/corridor/stairway widths can be narrower if code official determines safe exit is still possible.

1203.4: transoms can be kept if fixed in place and sprinkled on either side

1203.9: grand stairways do not have to meet handrail and guard requirements, provided they are structurally sound

1203.12: code official can approve an alternative fire extinguishing system

1204.4: 1 hour separation for occupancy can be omitted when fitted with approved automatic sprinkler system

1204.11: buildings less than 3,000 sq. ft. can retain stairways and guards in existing condition

etc.

Work Area Method - Summary

- **Repairs** can generally be done “in-kind”
- If more than repairs, amount of new code being met dependant on **level of alterations** (1, 2, or 3)
- If **Change of Use**, assess hazard level change for each hazard category -may or may not have additional requirements
- Chapter 12 lists **exceptions for “historic”** buildings

Work Area Method - IEBC Chapters 6-12

Pros:

- More flexible than Prescriptive Method
- Many exceptions for historic buildings/features
- Often only applies to area being modified

Cons:

- Change of Occupancy can kick you back to IBC in a number of areas (but not all)

Performance Method - IEBC Chapter 13 “scoring system”

CHAPTER 13

PERFORMANCE COMPLIANCE METHODS

User note:

About this chapter: Chapter 13 allows for existing buildings to be evaluated so as to show that alterations, while not meeting new construction requirements, will improve the current existing situation. Provisions are based on a numerical scoring system involving 19 various safety parameters and the degree of code compliance for each issue.

1301.1 Scope.

The provisions of this chapter shall apply to *the alteration, addition and change of occupancy of existing structures, including historic structures, as referenced in Section 301.3.3*. The provisions of this chapter are intended to maintain or increase the current degree of public safety, health and general welfare in *existing buildings* while *permitting, alteration, addition and change of occupancy without requiring full compliance with Chapters 6 through 12, except* where compliance with other provisions of this code is specifically required in this chapter.

- Licensed design professional must calculate
- Most flexibility, sometimes most burden on design professional: must calculate existing and then proposed to compare
- 3 categories: **Fire Safety, Means of Egress, and General Safety** with minimum score thresholds
- Score summary + structural analysis report is submitted to building department for review & approval

*Best to discuss with code official prior to undertaking this method

*Not applicable to hazardous and some institutional buildings

Performance Method - IEBC Chapter 13 “scoring system”

TABLE 1301.8 MANDATORY SAFETY SCORES^a

OCCUPANCY	FIRE SAFETY (MFS)	MEANS OF EGRESS (MME)	GENERAL SAFETY (MGS)
A-1	20	31	31
A-2	21	32	32
A-3	22	33	33
A-4, E	29	40	40
B	30	40	40
F	24	34	34
I-2	19	34	34
M	23	40	40
R	21	38	38
S-1	19	29	29
S-2	29	39	39

Performance Method - IEBC Chapter 13

Pros:

- Most flexible Method
- Only looks at a limited set of code requirements (~20)

Cons:

- Can sometimes be most work for design professional to calculate and summarize, but not always
- Legally required to have design professional calculate

CASE STUDY

UNION BLOCK 57 S. MAIN ST. BRIGHAM CITY

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Existing Conditions

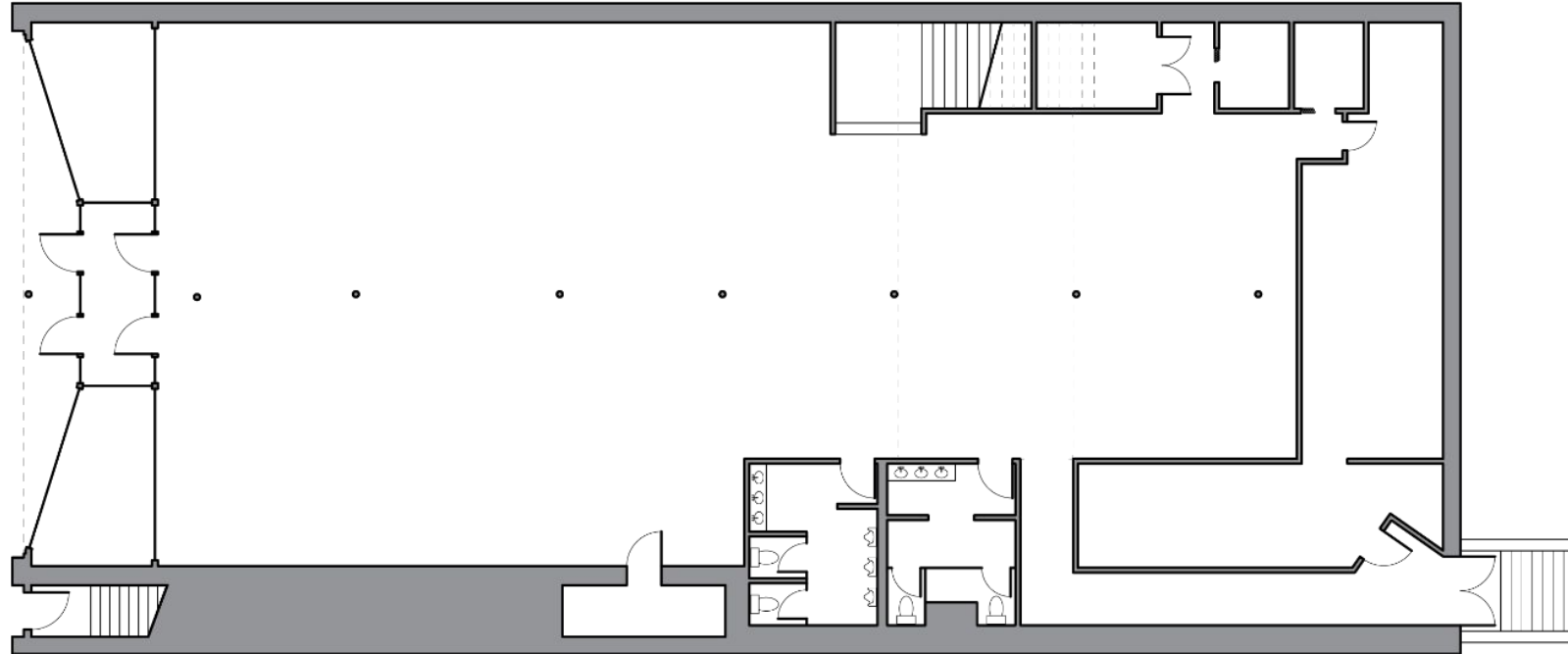
Case Study



Existing Conditions

Case Study

Ground Level (Occupancy M - Mercantile; Use - Department Store)

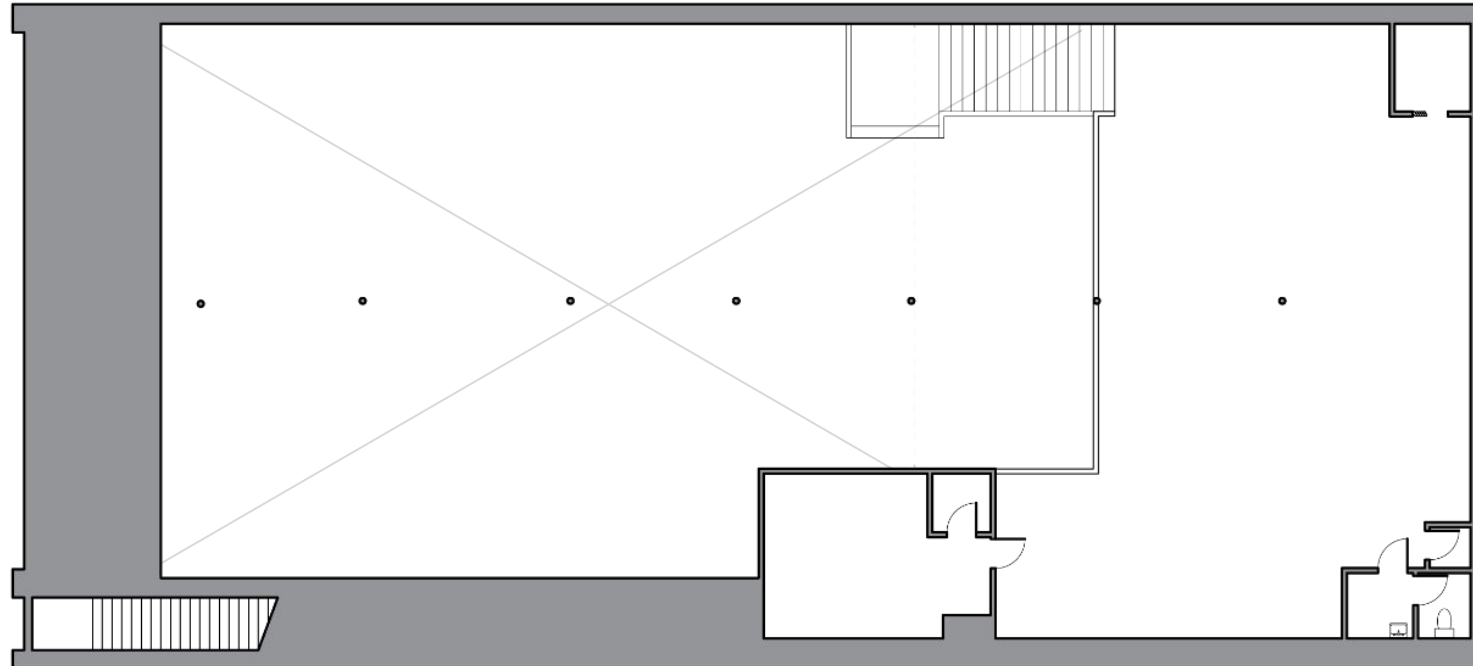


GROUND FLOOR
6,581 square feet
M Occupancy

Existing Conditions

Case Study

Mezzanine Level (Occupancy M - Mercantile; Use - Department Store)

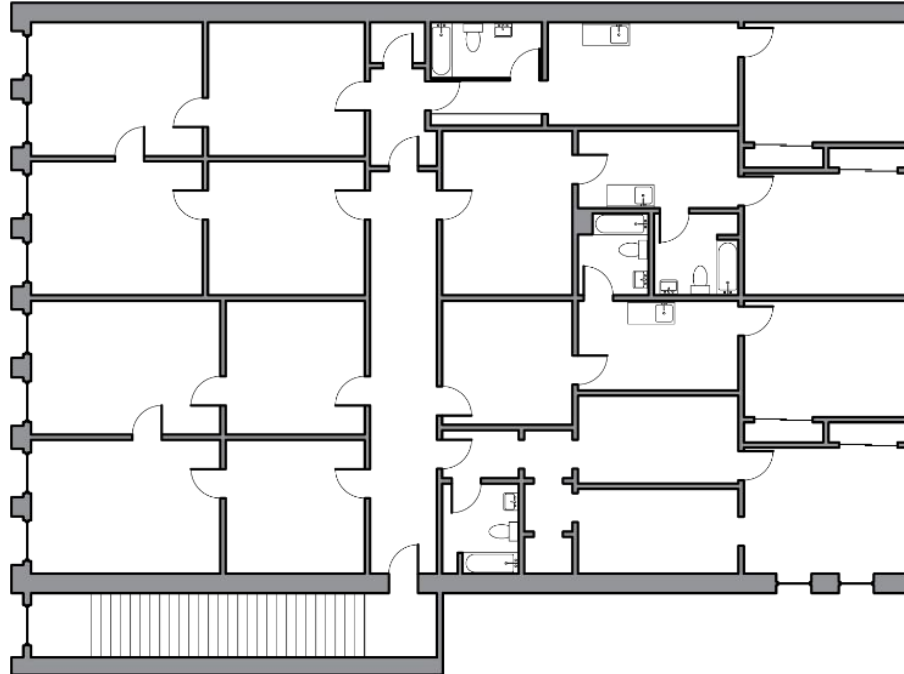


MEZZANINE LEVEL
2,063 square feet
M Occupancy

Existing Conditions

Case Study

Second Level (Occupancy R-2 - Residential; Use - Apartment Houses)
(Occupancy B - Business; Use - Professional Services)

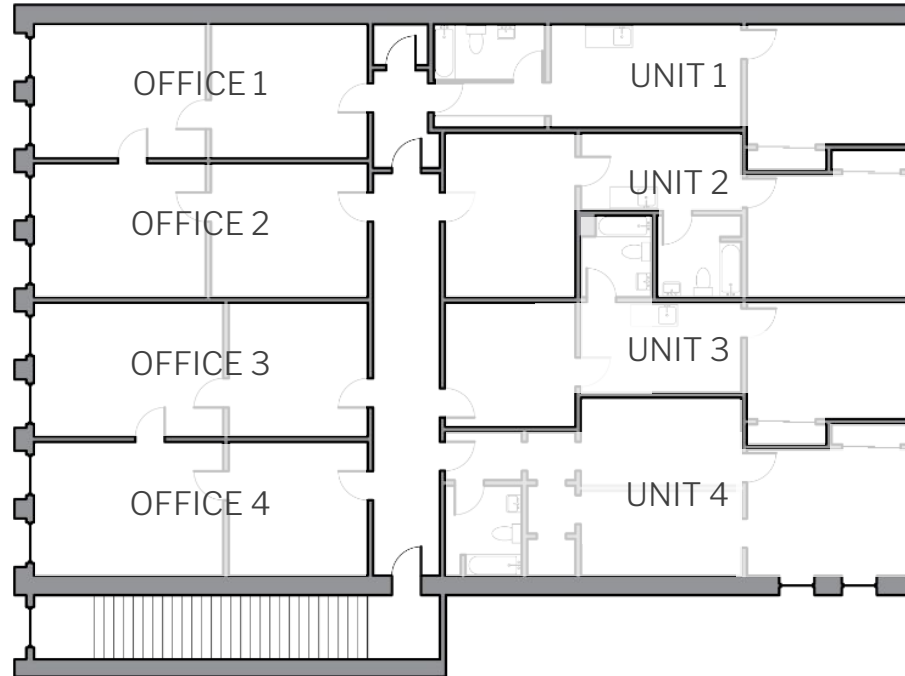


SECOND FLOOR
3,549 square feet
B Occupancy; R-2 Occupancy

Existing Conditions

Case Study

Second Level (Occupancy R-2 - Residential; Use - Apartment Houses)
(Occupancy B - Business; Use - Professional Services)



SECOND FLOOR
3,549 square feet
B Occupancy; R-2 Occupancy

Ground Level (M Occupancy - Mercantile; Use - Department Store)

- Update entry and storefront system
- Convert restrooms into accessible restrooms

Mezzanine Level (M Occupancy - Mercantile; Use - Department Store)

- Add a second changing room
- Convert restroom into accessible restroom

Second Level (R-2 Occupancy - Residential; Use - Apartment Houses)

- Convert four work/office areas at second floor into two one bedroom residential dwelling units
- Convert four one bedroom dwelling units at second floor into two two-bedroom units

PRESCRIPTIVE COMPLIANCE METHOD



Section 503 Alterations

503.1 General

Except as provided by Section 302.4, 302.5 or this section, alterations to any building or structure shall comply with the requirements of the *International Building Code* for new construction. *Alterations* shall be such that the *existing building* or structure is not less complying with the provisions of the *International Building Code* than the *existing building* or structure was prior to the *alteration*.

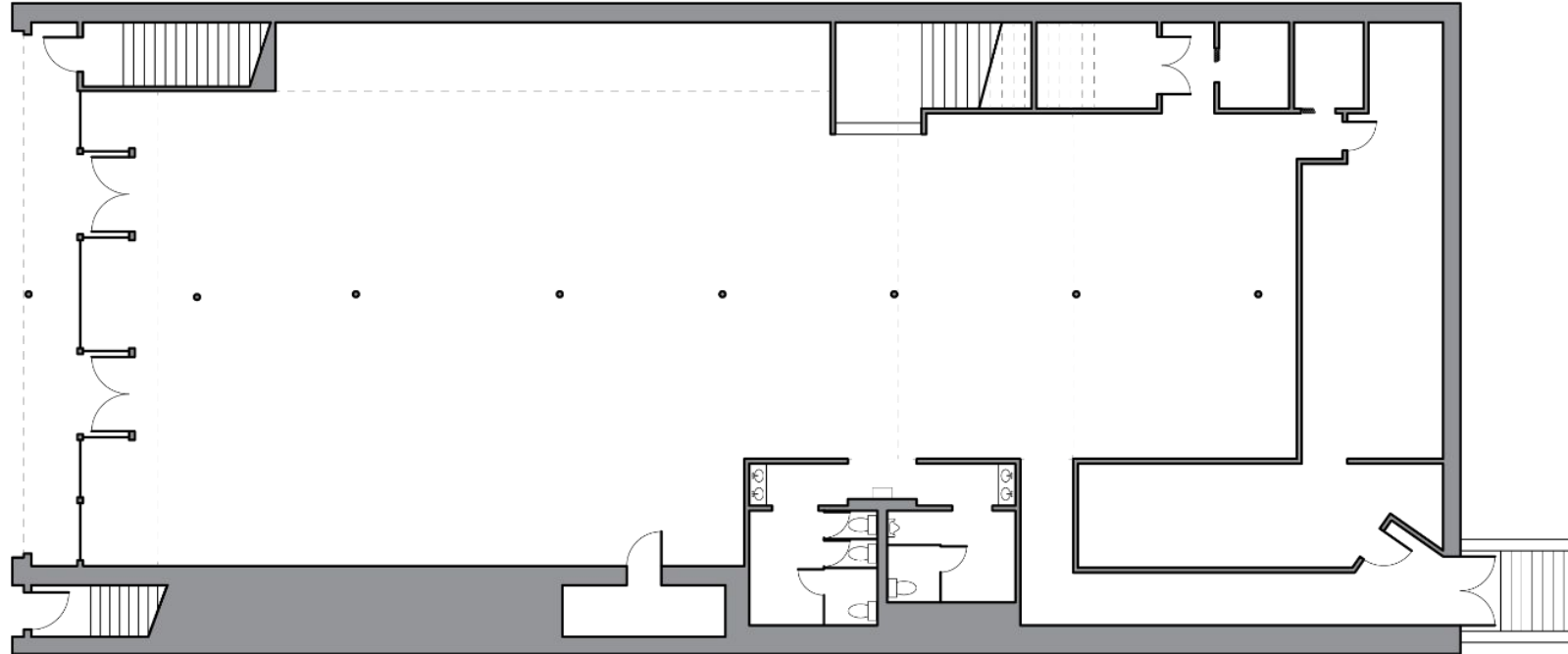
501.2 Fire-Resistance Ratings

Where *approved* by the *code official*, in buildings where an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2 of the *International Building Code* has been added, and the building is now sprinklered throughout, the required fire-resistance ratings of building elements and materials shall be permitted to meet the requirements of the current building code. The building is required to meet the other applicable requirements of the *International Building Code*.

Plans, investigation and evaluation reports, and other data shall be submitted indicating which building elements and materials the applicant is requesting the *code official* to review and approve for determination of applying the current building code fire-resistance ratings. Any special construction features, including fire-resistance-rated assemblies and smoke-resistive assemblies, conditions of occupancy, means of egress conditions, fire code deficiencies, *approved* modifications or *approved* alternative materials, design and methods of construction, and equipment applying to the building that impact required fire-resistance ratings shall be identified in the evaluation reports submitted.

Required Changes

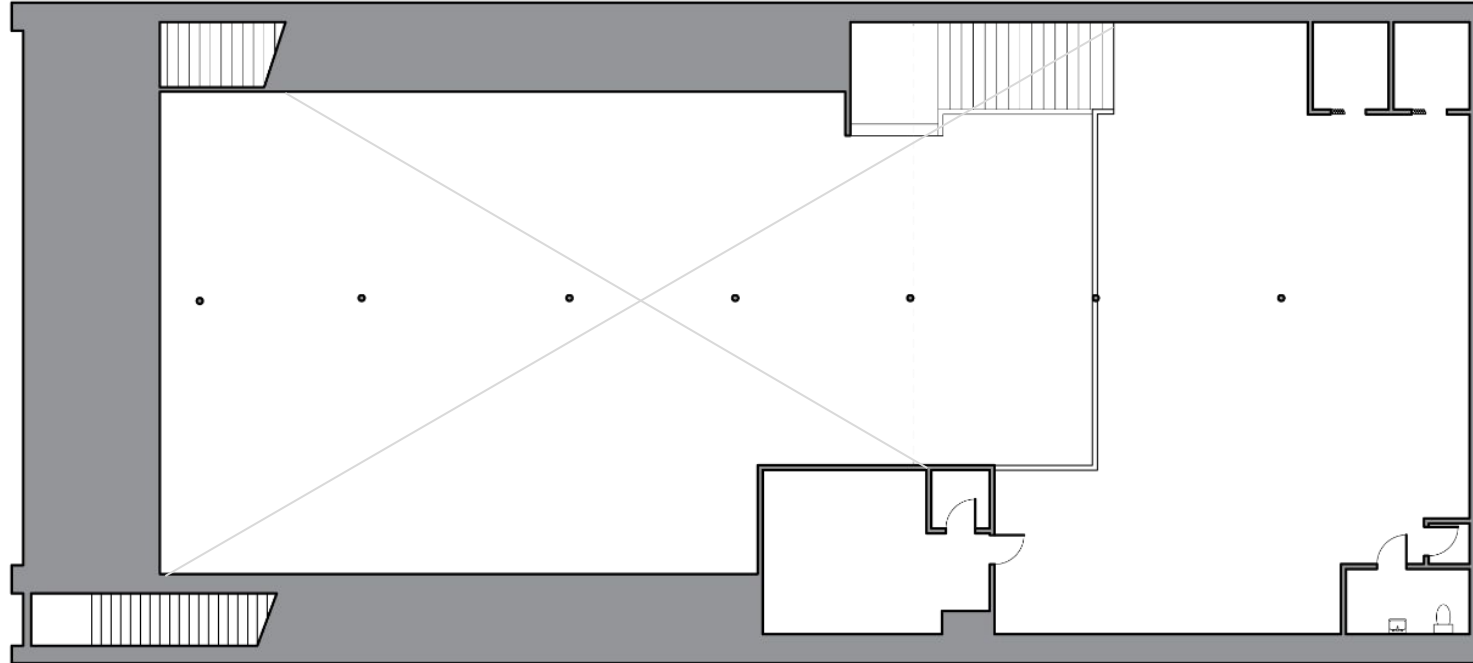
- Automatic sprinkler system throughout
- Second egress stair for residential level
- Seismic stabilization
- Major systems upgrades (HVAC, plumbing, electrical)



GROUND FLOOR
6,581 square feet
M Occupancy

Required Changes

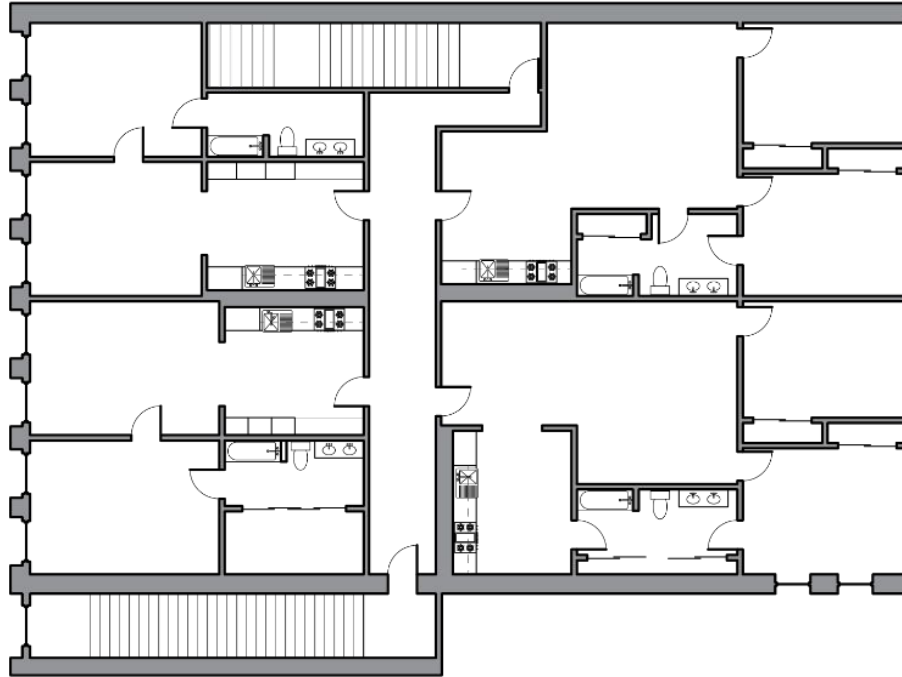
- Automatic sprinkler system throughout
- Second egress stair for residential level
- Seismic stabilization
- Major systems upgrades (HVAC, plumbing, electrical)



MEZZANINE LEVEL
2,063 square feet
M Occupancy

Required Changes

- Automatic sprinkler system throughout
- Second egress stair for residential level
- Seismic stabilization
- Major systems upgrades (HVAC, plumbing, electrical)
- Added smoke and carbon monoxide detectors in each sleeping unit and dwelling unit



SECOND FLOOR
3,549 square feet
R-2 Occupancy

WORK AREA COMPLIANCE METHOD



601.1 Scope

The provisions of this chapter shall be used in conjunction with Chapters 7 through 12 and shall apply to the *alteration, addition and change of occupancy of existing structures, including historic and moved structures*, as referenced in Section 301.3.2. The work performed on an *existing building* shall be classified in accordance with this chapter.

601.2 Work Area

The *work area*, as defined in Chapter 2, shall be identified on the construction documents.

Section 602 Alteration—Level 1

602.1 Scope

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.

Section 603 Alteration—Level 2

603.1 Scope

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.

Section 604 Alteration—Level 3

604.1 Scope

Level 3 *alterations* apply where the work area exceeds 50 percent of the building area.

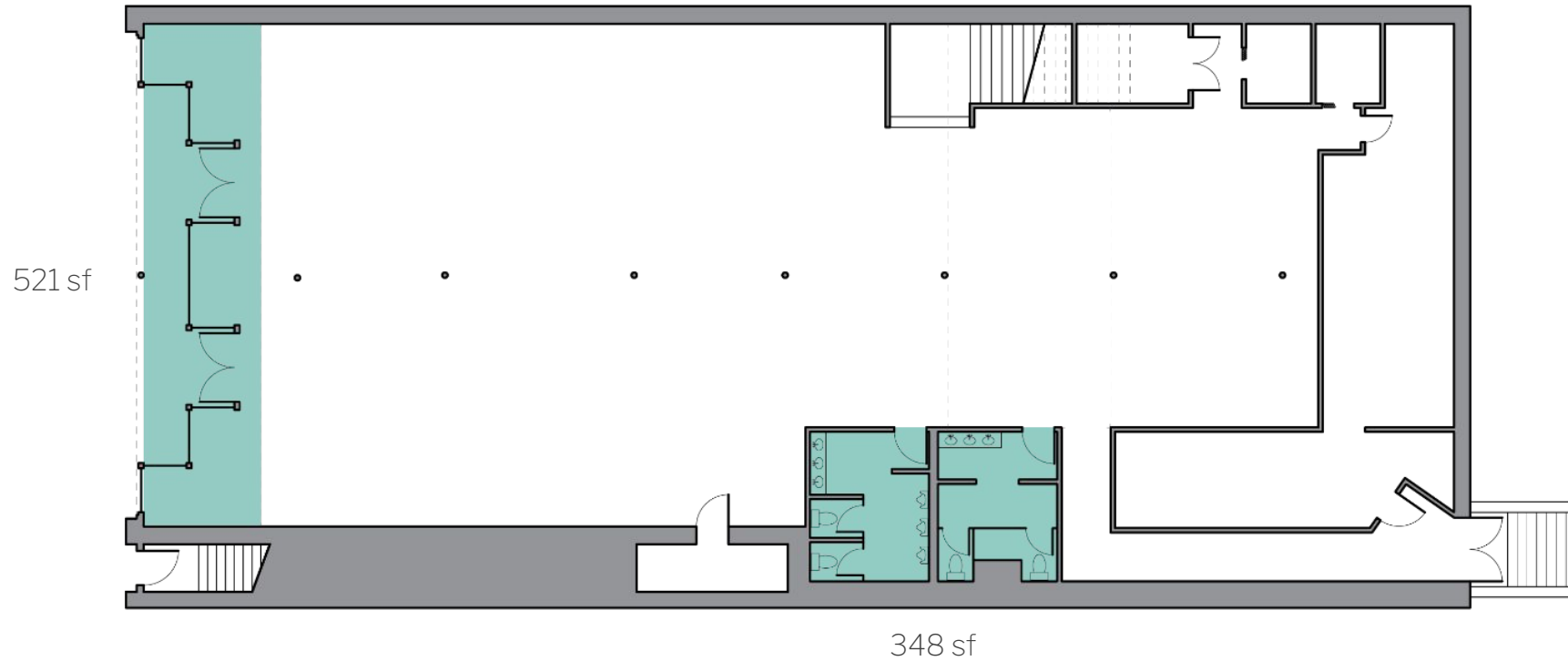
Work Area Method

Case Study

Work Area Calculation

$$521 \text{ sf} + 348 \text{ sf} = 869 \text{ sf}$$

$$869 \text{ sf} / 6,581 \text{ sf} = 13\%$$



GROUND FLOOR
6,581 square feet
M Occupancy

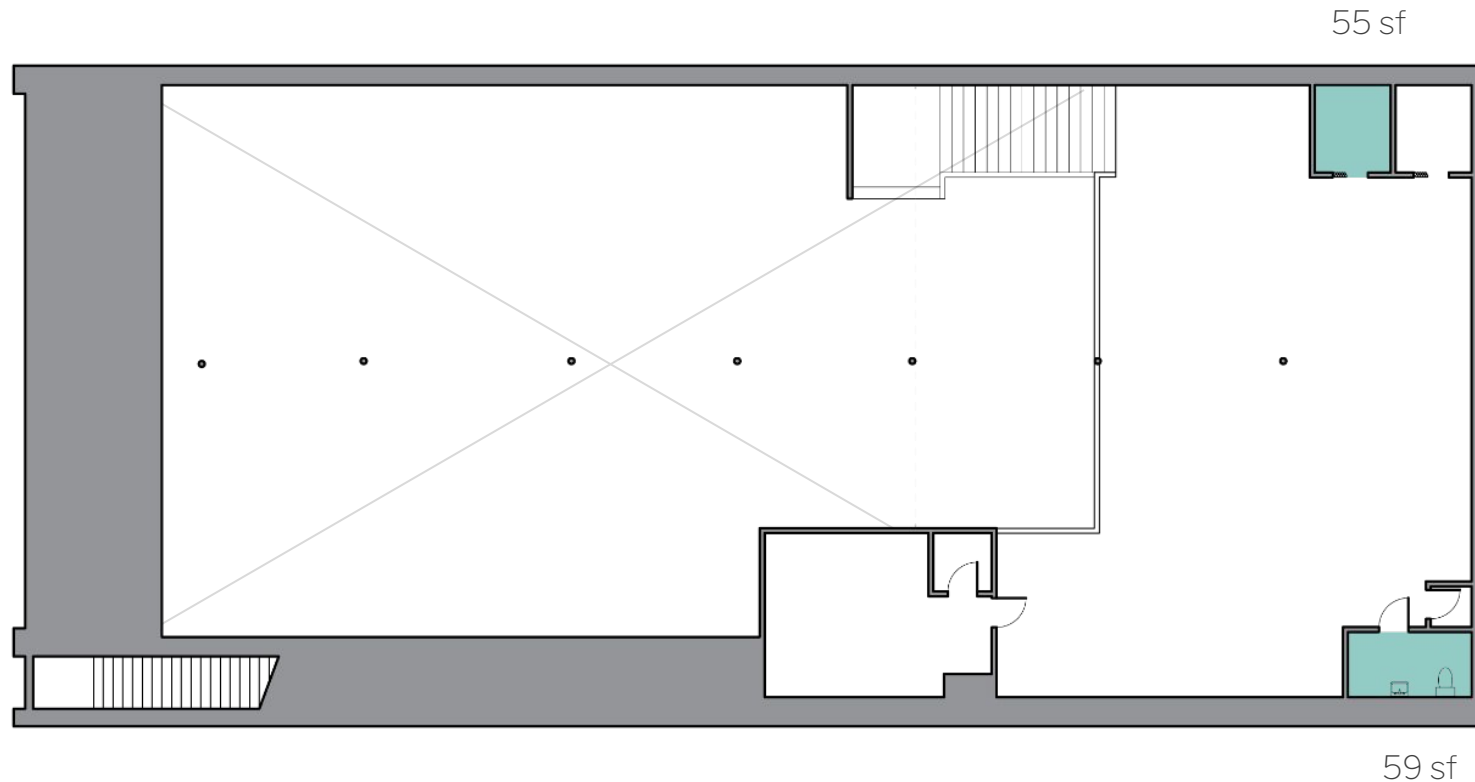
Work Area Method

Case Study

Work Area Calculation

$$55 \text{ sf} + 59 \text{ sf} = 114 \text{ sf}$$

$$114 \text{ sf} / 2,063 \text{ sf} = 6\%$$



MEZZANINE LEVEL
2,063 square feet
M Occupancy

Work Area Method

Case Study

Work Area Calculation

$$619 \text{ sf} + 1,196 \text{ sf} = 1,815 \text{ sf}$$

$$1,815 \text{ sf} / 3,549 \text{ sf} = 51\%$$



SECOND FLOOR
3,549 square feet
R-2 Occupancy

Work Area Method

Case Study

Work Area Calculation:

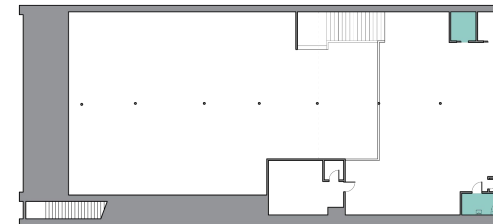
Ground Level	869 sf
Mezzanine Level	114 sf
Second Level	1,815 sf
<hr/>	
Total Work Area	2,798 sf

Total Building Area 12,193 sf

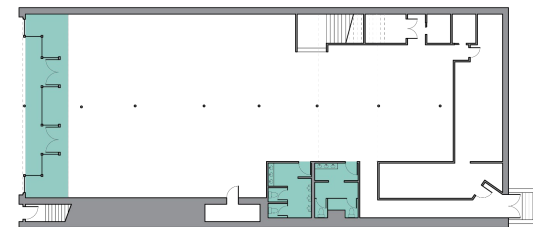
$2,798 \text{ sf} / 12,193 \text{ sf} = 23\%$ of building area



SECOND FLOOR



MEZZANINE LEVEL



GROUND FLOOR

Section 602 Alteration—Level 1

602.1 Scope

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.

Section 603 Alteration—Level 2

603.1 Scope

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.

Section 604 Alteration—Level 3

604.1 Scope

Level 3 *alterations* apply where the work area exceeds 50 percent of the building area.

Section 801 General

801.1 Scope

Level 2 alterations as described in Section 603 shall comply with the requirements of this chapter.

Exception: Buildings in which the reconfiguration is exclusively the result of compliance with the accessibility requirements of Section 305.7 shall be permitted to comply with Chapter 7.

801.2 Alteration Level 1 Compliance

In addition to the requirements of this chapter, all work shall comply with the requirements of Chapter 7.

805.2 General

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 NFPA 101.
2. Means of egress complying with the requirements of the building code under which the building was constructed shall be considered to be compliant means of egress if, in the opinion of the *code official*, they do not constitute a distinct hazard to life.

805.3.1.1 Single-Exit Buildings

A single exit or access to a single exit shall be permitted from spaces, any story or any occupied roof where one of the following conditions exists:

1. The occupant load, number of dwelling units and exit access travel distance do not exceed the values in Table 805.3.1.1(1) or 805.3.1.1(2).

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 ^a	4 dwelling units	50
Third story above grade plane and higher	NP	NA	NA

805.3.1.1 Single Exit Buildings (cont'd)

2. In Group R-1 or R-2, nonsprinklered buildings, individual single-story or multiple-story dwelling or sleeping units shall be permitted to have a single exit or access to a single exit from the dwelling or sleeping unit provided one of the following criteria are met:

2.1. The occupant load is not greater than 10 and the exit access travel distance within the unit does not exceed 75 feet (22 860 mm).

2.2. The building is not more than three stories in height; all third-story space is part of dwelling with an exit access doorway on the second story; and the portion of the exit access travel distance from the door to any habitable room within any such unit to the unit entrance doors does not exceed 50 feet (15 240 mm).

805.3.1.1 Single Exit Buildings (cont'd)

3. In buildings of Group R-2 occupancy of any number of stories with not more than four dwelling units per floor served by an interior exit stairway; with a smokeproof enclosure in accordance with Sections 909.20 and 1023.11 of the *International Building Code* or an exterior stairway as an exit; and where the portion of the exit access travel distance from the dwelling unit entrance door to the exit is not greater than 20 feet (6096 mm).

IEBC Chapter 10 - Change of Occupancy

1011.4 Means of Egress, General

Hazard categories in regard to life safety and means of egress shall be in accordance with Table 1011.4.

TABLE 1011.4

MEANS OF EGRESS HAZARD CATEGORIES

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

1011.4.1 Means of Egress for Change to a Higher-Hazard Category

Diagram

Where a change of occupancy classification is made to a higher-hazard category (lower number) as shown in Table 1011.4, the means of egress shall comply with the requirements of Chapter 10 of the *International Building Code*.

Exceptions:

1. Stairways shall be enclosed in compliance with the applicable provisions of Section 903.1.
2. Existing stairways including handrails and guards complying with the requirements of Chapter 9 shall be permitted for continued use subject to approval of the *code official*.
3. Any stairway replacing an existing stairway within a space where the pitch or slope cannot be reduced because of existing construction shall not be required to comply with the maximum riser height and minimum tread depth requirements.
4. Existing corridor walls constructed on both sides of wood lath and plaster in good condition or $\frac{1}{2}$ -inch-thick (12.7 mm) gypsum wallboard shall be permitted. Such walls shall either terminate at the underside of a ceiling of equivalent construction or extend to the underside of the floor or roof next above.

5. Existing corridor doorways, transoms and other corridor openings shall comply with the requirements in Sections 805.5.1, 805.5.2 and 805.5.3.
6. Existing dead-end corridors shall comply with the requirements in Section 805.6.
7. An existing operable window with clear opening area not less than 4 square feet (0.38 m²) and minimum opening height and width of 22 inches (559 mm) and 20 inches (508 mm), respectively, shall be accepted as an emergency escape and rescue opening.

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. Where Chapter 10 requires compliance with specific requirements of Chapter 7, Chapter 8 or Chapter 9 and where those requirements are subject to the exceptions in Section 1202, the same exceptions shall apply to this section.

1204.4 - Occupancy Separation

1204.6 - Means of Egress

1204.7 - Door Swing

1204.10 - One-Hour Fire-Resistant Assemblies

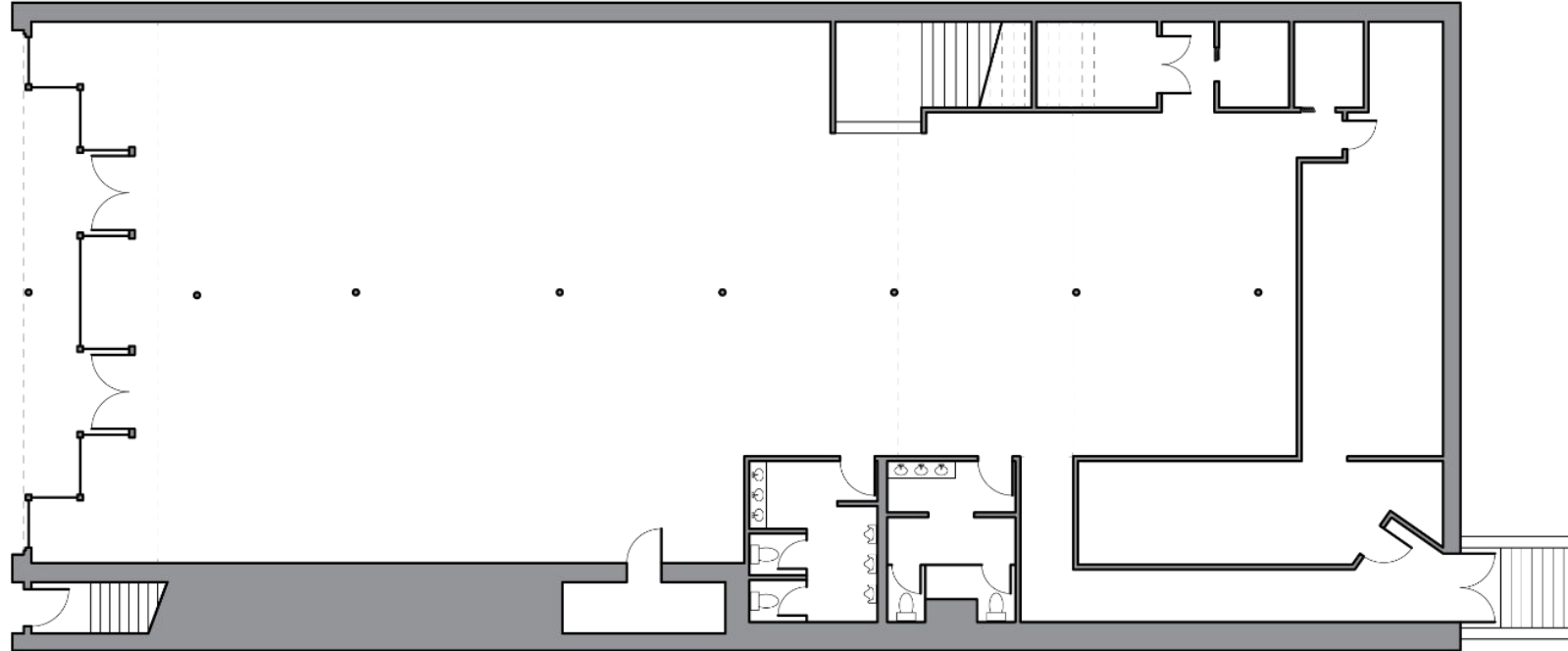
1204.11 - Stairways and Guards

1204.12 - Exit Signs

1204.13 - Exit Stair Live Load

Required Changes

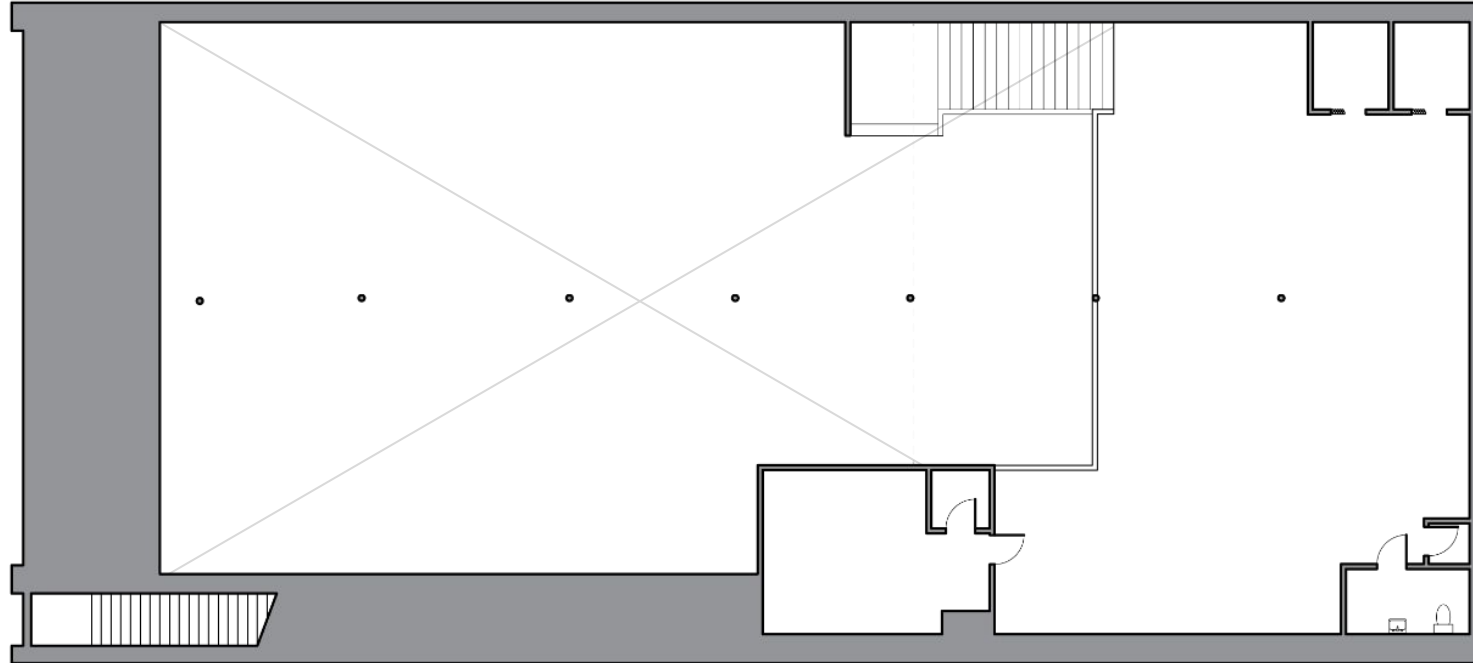
- All new materials, systems, and equipment must meet code requirements



GROUND FLOOR
6,581 square feet
M Occupancy

Required Changes

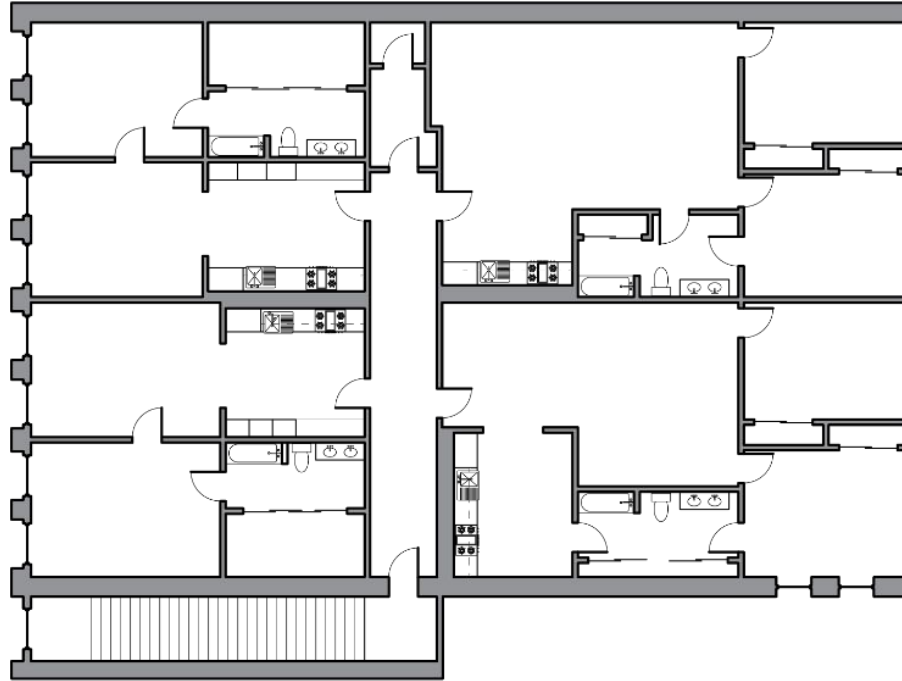
- All new materials, systems, and equipment must meet code requirements



MEZZANINE LEVEL
2,063 square feet
M Occupancy

Required Changes

- All new materials, systems, and equipment must meet code requirements
- Automatic sprinkler system on second level
- Installation of smoke, fire, and carbon monoxide detection systems
- Upgrades to ensure egress stair is smoke tight



SECOND FLOOR
3,549 square feet
R-2 Occupancy

PERFORMANCE COMPLIANCE METHOD



1301.1 Scope

The provisions of this chapter shall apply to the *alteration, addition and change of occupancy of existing structures*, including historic structures, as referenced in Section 301.3.3. The provisions of this chapter are intended to maintain or increase the current degree of public safety, health and general welfare in existing buildings while permitting, alteration, addition and change of occupancy without requiring full compliance with Chapters 6 through 12, except where compliance with other provisions of this code is specifically required in this chapter.

Preliminary Evaluation of Existing Conditions

SAFETY PARAMETERS	FIRE SAFETY (FS)	MEANS OF EGRESS (ME)	GENERAL SAFETY (GS)
1301.6.1 Building height	1.00	1.00	1.00
1301.6.2 Building area	25.83	25.83	25.83
1301.6.3 Compartmentation	4.00	4.00	4.00
1301.6.4 Tenant and dwelling unit separations	-4.00	-4.00	-4.00
1301.6.5 Corridor walls	-7.00	-7.00	-7.00
1301.6.6 Vertical openings	2.00	2.00	2.00
1301.6.7 HVAC systems	0.00	0.00	0.00
1301.6.8 Automatic fire detection	0.00	0.00	0.00
1301.6.9 Fire alarm system	-5.00	-5.00	-5.00
1301.6.10 Smoke control	****	4.00	4.00
1301.6.11 Means of egress	****	-3.00	-3.00
1301.6.12 Dead ends	****	-2.00	-2.00
1301.6.13 Maximum exit access travel distance	****	5.75	5.75
1301.6.14 Elevator control	-2.00	-2.00	-2.00
1301.6.15 Means of egress emergency lighting	****	0.00	0.00
1301.6.16 Mixed occupancies	-5.00	****	-5.00
1301.6.17 Automatic sprinklers	-3.00	-3.00 + 2 = -1.50	-3.00
1301.6.18 Standpipes	0.00	0.00	0.00
1301.6.19 Incidental use	0.00	0.00	0.00
1301.6.20 Smoke compartmentation	0.00	0.00	0.00
1301.6.21.1 Patient ability for self-preservation ^a	****	N/A	N/A
1301.6.21.2 Patient concentration ^a	****	N/A	N/A
1301.6.21.3 Attendant-to-patient ratio ^a	****	N/A	N/A
Building score—total value	6.83	18.00	11.50

SAFETY PARAMETERS	FIRE SAFETY (FS)	MEANS OF EGRESS (ME)	GENERAL SAFETY (GS)
1301.6.1 Building height	1.00	1.00	1.00
1301.6.2 Building area	25.83	25.83	25.83
1301.6.3 Compartmentation	4.00	4.00	4.00

- Evaluation consists of twenty Safety Parameters, each addressing a specific code section of the IBC
- Points are awarded or subtracted based on the extent to which the building complies (or fails to comply) with the International Building Code
- Existing building is evaluated as-is to provide a baseline score
- Proposed design is evaluated and must achieve scores:
 - 1) Higher than the baseline score
 - 2) Higher than the code-established minimums in Table 1301.8

Performance Method

Case Study

Preliminary Evaluation of Existing Conditions

SAFETY PARAMETERS	FIRE SAFETY (FS)	MEANS OF EGRESS (ME)	GENERAL SAFETY (GS)
1301.6.1 Building height	1.00	1.00	1.00
1301.6.2 Building area	25.83	25.83	25.83
1301.6.3 Compartmentation	4.00	4.00	4.00
1301.6.4 Tenant and dwelling unit separations	-4.00	-4.00	-4.00
1301.6.5 Corridor walls	-7.00	-7.00	-7.00
1301.6.6 Vertical openings	2.00	2.00	2.00
1301.6.7 HVAC systems	0.00	0.00	0.00
1301.6.8 Automatic fire detection	0.00	0.00	0.00
1301.6.9 Fire alarm system	-5.00	-5.00	-5.00
1301.6.10 Smoke control	****	4.00	4.00
1301.6.11 Means of egress	****	-3.00	-3.00
1301.6.12 Dead ends	****	-2.00	-2.00
1301.6.13 Maximum exit access travel distance	****	5.75	5.75
1301.6.14 Elevator control	-2.00	-2.00	-2.00
1301.6.15 Means of egress emergency lighting	****	0.00	0.00
1301.6.16 Mixed occupancies	-5.00	****	-5.00
1301.6.17 Automatic sprinklers	-3.00	-3.00 + 2 + -1.50	-3.00
1301.6.18 Standpipes	0.00	0.00	0.00
1301.6.19 Incidental use	0.00	0.00	0.00
1301.6.20 Smoke compartmentation	0.00	0.00	0.00
1301.6.21.1 Patient ability for self-preservation ^a	****	N/A	N/A
1301.6.21.2 Patient concentration ^a	****	N/A	N/A
1301.6.21.3 Attendant-to-patient ratio ^a	****	N/A	N/A
Building score—total value	6.83	18.08	11.58

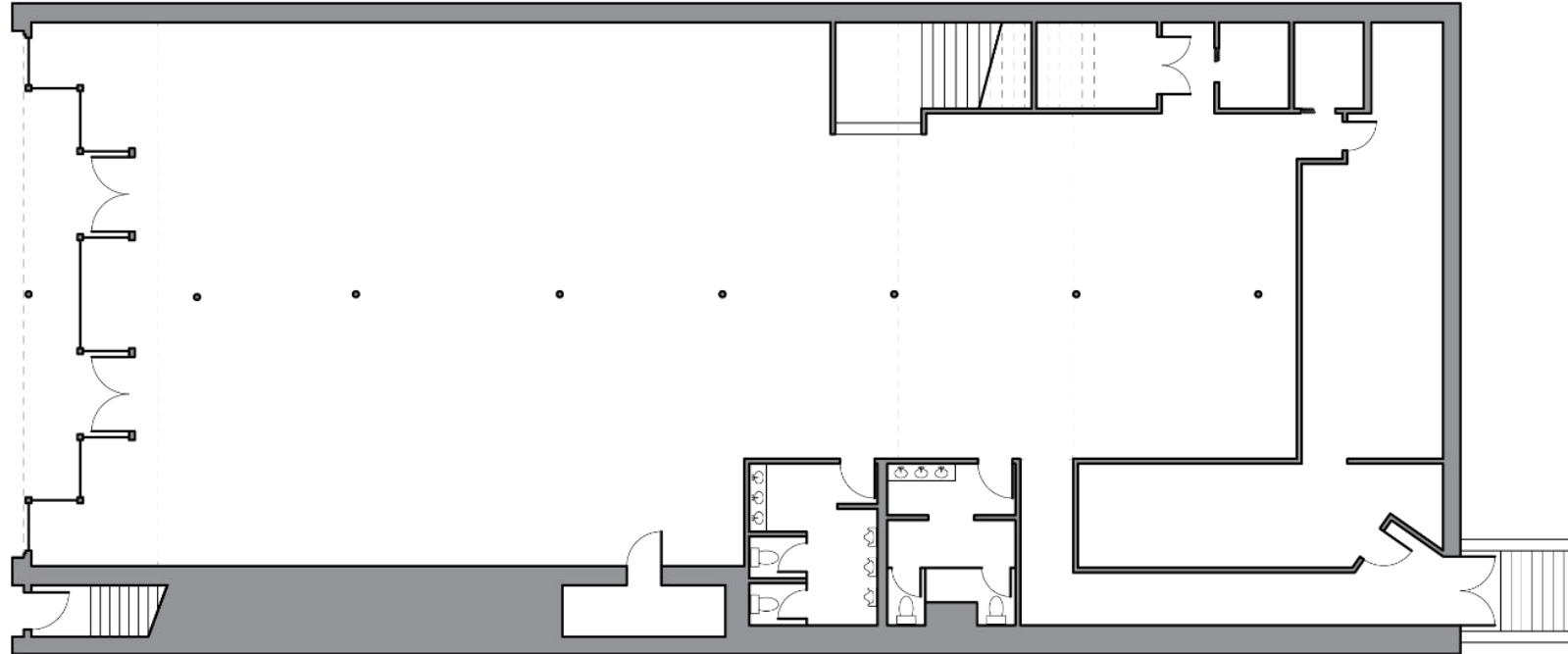
TABLE 1301.8
MANDATORY SAFETY SCORES^a

OCCUPANCY	FIRE SAFETY (MFS)	MEANS OF EGRESS (MME)	GENERAL SAFETY (MGS)
B	30	40	40
F	24	34	34
I-2	19	34	34
M	23	40	40
R	21	38	38

1301.6.20 Smoke compartmentation	0.00	0.00	0.00
1301.6.21.1 Patient ability for self-preservation ^a	****	N/A	N/A
1301.6.21.2 Patient concentration ^a	****	N/A	N/A
1301.6.21.3 Attendant-to-patient ratio ^a	****	N/A	N/A
Building score—total value	6.83	18.08	11.58

Proposed Changes

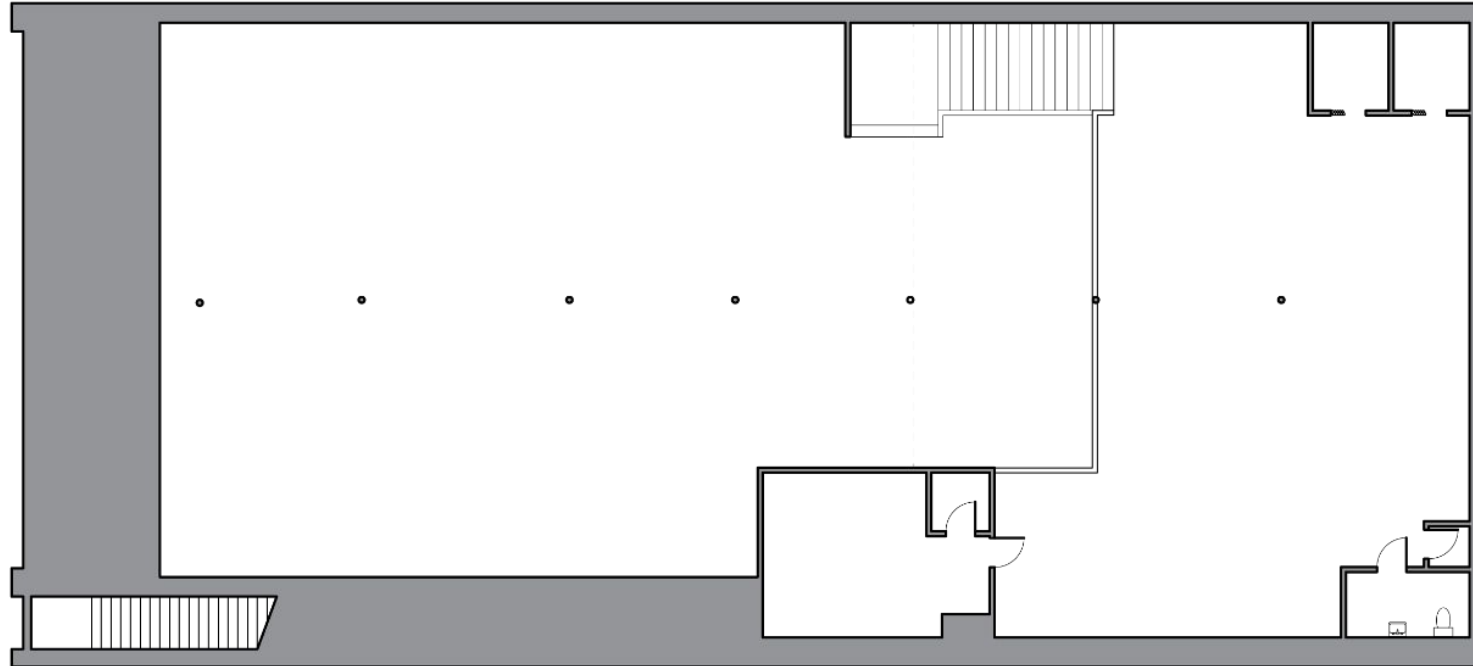
- Addition of smoke and fire detection system



GROUND FLOOR
6,581 square feet
M Occupancy

Proposed Changes

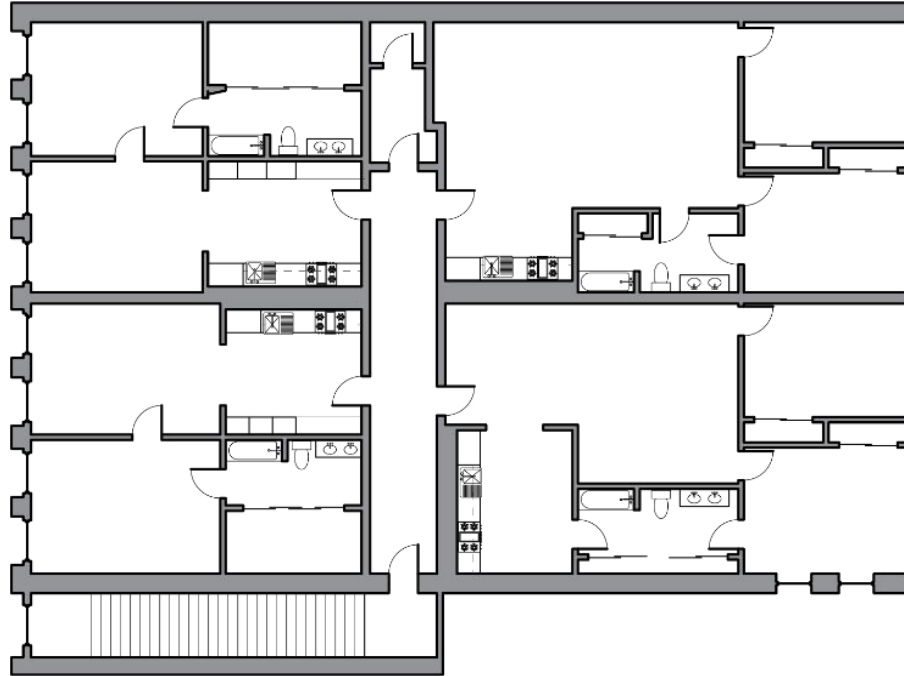
- Addition of smoke and fire detection system



MEZZANINE LEVEL
2,063 square feet
M Occupancy

Proposed Changes

- Addition of smoke and fire detection system
- Addition of mini-split HVAC system at residential level
- Increased fire ratings at corridor walls and walls between units
- Retrofit corridor doors to provide fire rating
- Addition of automatic sprinkler system



SECOND FLOOR
3,549 square feet
R-2 Occupancy

1301.6.4 Tenant and dwelling unit separations

TABLE 1301.6.4

SEPARATION VALUES

OCCUPANCY	CATEGORIES				
	a	b	c	d	e
A-1	0	0	0	0	1
A-2	-5	-3	0	1	3
R	-4	-2	0	2	4
A-3, A-4, B, E, F, M, S-1	-4	-3	0	2	4
I-2	0	1	2	3	4
S-2	-5	-2	0	2	4

1301.6.4.1 Categories

The categories for tenant and dwelling unit separations are:

1. Category a—No fire partitions; incomplete fire partitions; no doors; doors not self-closing or automatic-closing.
2. Category b—Fire partitions or floor assemblies with less than 1-hour fire-resistance ratings or not constructed in accordance with Section 708 or 711 of the *International Building Code*, respectively.
3. Category c—Fire partitions with 1-hour or greater fire-resistance ratings constructed in accordance with Section 708 of the *International Building Code* and floor assemblies with 1-hour but less than 2-hour fire-resistance ratings constructed in accordance with Section 711 of the *International Building Code* or with only one tenant within the floor area.

Performance Method

Case Study

1301.6.4 Tenant and dwelling unit separations

Preliminary Evaluation:

1301.6.4 Tenant and dwelling unit separations	-4.00	-4.00	-4.00
1301.6.5 Corridor walls	-7.00	-7.00	-7.00
1301.6.6 Vertical openings	2.00	2.00	2.00

Design Evaluation:

1301.6.4 Tenant and dwelling unit separations	0.00	0.00	0.00
1301.6.5 Corridor walls	0.00	0.00	0.00
1301.6.6 Vertical openings	2.00	2.00	2.00

1301.6.5 Corridor walls

TABLE 1301.6.5

CORRIDOR WALL VALUES

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

a. Corridors not providing at least one-half the exit access travel distance for all occupants on a floor shall use Category b.

1301.6.5.1 Categories

The categories for corridor walls are:

1. Category a—No fire partitions; incomplete fire partitions; no doors; or doors not self-closing.
2. Category b—Less than 1-hour fire-resistance rating or not constructed in accordance with Section 708.4 of the *International Building Code*.
3. Category c—1-hour to less than 2-hour fire-resistance rating, with doors conforming to Section 716 of the *International Building Code* or without corridors as permitted by Section 1020 of the *International Building Code*.
4. Category d—2-hour or greater fire-resistance rating, with doors conforming to Section 716 of the *International Building Code*.

Performance Method

Case Study

1301.6.5 Corridor walls

Preliminary Evaluation:

1301.6.4 Tenant and dwelling unit separations	-4.00	-4.00	-4.00
1301.6.5 Corridor walls	-7.00	-7.00	-7.00
1301.6.6 Vertical openings	2.00	2.00	2.00

Design Evaluation:

1301.6.4 Tenant and dwelling unit separations	0.00	0.00	0.00
1301.6.5 Corridor walls	0.00	0.00	0.00
1301.6.6 Vertical openings	2.00	2.00	2.00

1301.6.7 HVAC Systems

1301.6.7.1 Categories

The categories for HVAC systems are:

1. Category a—Plenums not in accordance with Section 602 of the *International Mechanical Code*. -10 points.
2. Category b—Air movement in egress elements not in accordance with Section 1020.5 of the *International Building Code*. -5 points.
3. Category c—Both Categories a and b are applicable. -15 points.
4. Category d—Compliance of the HVAC system with Section 1020.5 of the *International Building Code* and Section 602 of the *International Mechanical Code*. 0 points.
5. Category e—Systems serving one story; or a central boiler/chiller system without ductwork connecting two or more stories. +5 points.

Preliminary Evaluation:

1301.6.7 HVAC systems	0.00	0.00	0.00
1301.6.8 Automatic fire detection	0.00	0.00	0.00
1301.6.9 Fire alarm system	-5.00	-5.00	-5.00

Design Evaluation:

1301.6.7 HVAC systems	5.00	5.00	5.00
1301.6.8 Automatic fire detection	6.00	6.00	6.00
1301.6.9 Fire alarm system	0.00	0.00	0.00

1301.6.8 Automatic Fire Detection

TABLE 1301.6.8

AUTOMATIC FIRE DETECTION VALUES

OCCUPANCY	CATEGORIES					
	a	b	c	d	e	f
A-1, A-3, F, M, R, S-1	-10	-5	0	2	6	NA
A-2	-25	-5	0	5	9	NA
A-4, B, E, S-2	-4	-2	0	4	8	NA
I-2	NP	NP	NP	4	5	2

1301.6.8.1 Categories

The categories for automatic fire detection are:

1. Category a—None.
2. Category b—Existing smoke detectors in HVAC systems and maintained in accordance with the *International Fire Code*.
3. Category c—Smoke detectors in HVAC systems. The detectors are installed in accordance with the requirements for new buildings in the *International Mechanical Code*.
4. Category d—Smoke detectors throughout all floor areas other than individual sleeping units, tenant spaces and dwelling units.
5. Category e—Smoke detectors installed throughout the floor area.
6. Category f—Smoke detectors in corridors only.

1301.6.8 Automatic Fire Detection

Preliminary Evaluation:

1301.6.7 HVAC systems	0.00	0.00	0.00
1301.6.8 Automatic fire detection	0.00	0.00	0.00
1301.6.9 Fire alarm system	-5.00	-5.00	-5.00

Design Evaluation:

1301.6.7 HVAC systems	5.00	5.00	5.00
1301.6.8 Automatic fire detection	6.00	6.00	6.00
1301.6.9 Fire alarm system	0.00	0.00	0.00

1301.6.9 Automatic Fire Detection

1301.6.9.1 Categories

The categories for fire alarm systems are:

TABLE 1301.6.9

FIRE ALARM SYSTEM VALUES

OCCUPANCY	CATEGORIES			
	a	b ^a	c	d
A-1, A-2, A-3, A-4, B, E, R	-10	-5	0	5
F, M, S	0	5	10	15
I-2	-4	1	2	5

a. For buildings equipped throughout with an automatic sprinkler system, add 2 points for activation by a sprinkler water-flow device.

1. Category a—None.
2. Category b—Fire alarm system with manual fire alarm boxes in accordance with Section 907.4 of the *International Building Code* and alarm notification appliances in accordance with Section 907.5.2 of the *International Building Code*.
3. Category c—Fire alarm system in accordance with Section 907 of the *International Building Code*.
4. Category d—Category c plus a required emergency voice/alarm communications system and a fire command station that conforms to Section 911 of the *International Building Code* and contains the emergency voice/alarm communications system controls, fire department communication system controls, and any other controls specified in Section 911 of the *International Building Code* where those systems are provided.

Performance Method

Case Study

1301.6.9 Fire alarm system

Preliminary Evaluation:

1301.6.7 HVAC systems	0.00	0.00	0.00
1301.6.8 Automatic fire detection	0.00	0.00	0.00
1301.6.9 Fire alarm system	-5.00	-5.00	-5.00

Design Evaluation:

1301.6.7 HVAC systems	5.00	5.00	5.00
1301.6.8 Automatic fire detection	6.00	6.00	6.00
1301.6.9 Fire alarm system	0.00	0.00	0.00

1301.6.12 Dead ends

TABLE 1301.6.12

DEAD-END VALUES

OCCUPANCY	CATEGORIES ^a			
	a	b	c	d
A-1, A-3, A-4, B, F, M, R, S	-2	0	2	-4
A-2, E	-2	0	2	-4
I-2	-2	0	2	-6

a. For dead-end distances between categories, the dead-end value shall be obtained by linear interpolation.

1301.6.12.1 Categories

The categories for dead ends are:

1. Category a—Dead end of 35 feet (10 670 mm) in nonsprinklered buildings or 70 feet (21 340 mm) in sprinklered buildings.
2. Category b—Dead end of 20 feet (6096 mm); or 50 feet (15 240 mm) in Group B in accordance with Section 1020.4, Exception 2, of the *International Building Code*.
3. Category c—No dead ends; or ratio of length to width (l/w) is less than 2.5:1.
4. Category d—Dead ends exceeding Category a.

1301.6.12 Dead ends

1020.4 Dead Ends

[Diagram](#)[Calculate](#) P

Where more than one exit or *exit access doorway* is required, the *exit access* shall be arranged such that dead-end *corridors* do not exceed 20 feet (6096 mm) in length.

Exceptions:

1. In in Group I-3, Condition 2, 3 or 4, occupancies, the dead end in a *corridor* shall not exceed 50 feet (15 240 mm).
2. In occupancies in Groups B, E, F, I-1, M, R-1, R-2, S and U, where the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, the length of the dead-end *corridors* shall not exceed 50 feet (15 240 mm).
3. A dead-end *corridor* shall not be limited in length where the length of the dead-end *corridor* is less than 2.5 times the least width of the dead-end corridor.

Performance Method

Case Study

1301.6.12 Dead ends

Preliminary Evaluation:

1301.6.10 Smoke control	****	4.00	4.00
1301.6.11 Means of egress	****	-3.00	-3.00
1301.6.12 Dead ends	****	-2.00	-2.00

Design Evaluation:

1301.6.10 Smoke control	****	4.00	4.00
1301.6.11 Means of egress	****	-3.00	-3.00
1301.6.12 Dead ends	****	0.00	0.00

1301.6.16 Mixed Occupancies

TABLE 1301.6.16

MIXED OCCUPANCY VALUES^a

OCCUPANCY	CATEGORIES		
	a	b	c
A-1, A-2, R	-10	0	10
A-3, A-4, B, E, F, M, S	-5	0	5
I-2	NP	0	5

1301.6.16.1 Categories

The categories for mixed occupancies are:

1. Category a—Occupancies separated by minimum 1-hour fire barriers or minimum 1-hour horizontal assemblies, or both.
2. Category b—Separations between occupancies in accordance with Section 508.4 of the *International Building Code*.
3. Category c—Separations between occupancies having a fire-resistance rating of not less than twice that required by Section 508.4 of the *International Building Code*.

a. For fire-resistance ratings between categories, the value shall be obtained by linear interpolation.

Performance Method

Case Study

1301.6.16 Mixed Occupancies

Preliminary Evaluation:

1301.6.16 Mixed occupancies	-7.50	****	-7.50
1301.6.17 Automatic sprinklers	-3.00	$-3.00 \div 2 = -1.50$	-3.00
1301.6.18 Standpipes	0.00	0.00	0.00

Design Evaluation:

1301.6.16 Mixed occupancies	0.00	****	0.00
1301.6.17 Automatic sprinklers	2.00	$2.00 \div 2 = 1.00$	2.00
1301.6.18 Standpipes	0.00	0.00	0.00

1301.6.17 Automatic Sprinklers

TABLE 1301.6.17

SPRINKLER SYSTEM VALUES

OCCUPANCY	CATEGORIES					
	a ^a	b ^a	c	d	e	f
A-1, A-3, F, M, R, S-1	-6	-3	0	2	4	6
A-2	-4	-2	0	1	2	4
A-4, B, E, S-2	-12	-6	0	3	6	12
I-2	NP	NP	NP	8	10	NP

1301.6.17.1 Categories

The categories for automatic sprinkler system protection are:

1. Category a—Sprinklers are required throughout; sprinkler protection is not provided or the sprinkler system design is not adequate for the hazard protected in accordance with Section 903 of the *International Building Code*.
2. Category b—Sprinklers are required in a portion of the building; sprinkler protection is not provided or the sprinkler system design is not adequate for the hazard protected in accordance with Section 903 of the *International Building Code*.
3. Category c—Sprinklers are not required; none are provided.
4. Category d—Sprinklers are required in a portion of the building; sprinklers are provided in such portion; the system is one that complied with the code at the time of installation and is maintained and supervised in accordance with Section 903 of the *International Building Code*.

a. These options cannot be taken if Category a in Section 1301.6.18 is used.

1301.6.16 Mixed Occupancies

Preliminary Evaluation:

1301.6.16 Mixed occupancies	-7.50	****	-7.50
1301.6.17 Automatic sprinklers	-3.00	$-3.00 \div 2 = -1.50$	-3.00
1301.6.18 Standpipes	0.00	0.00	0.00

Design Evaluation:

1301.6.16 Mixed occupancies	0.00	****	0.00
1301.6.17 Automatic sprinklers	2.00	$2.00 \div 2 = 1.00$	2.00
1301.6.18 Standpipes	0.00	0.00	0.00

Performance Method

Case Study

Preliminary Evaluation of Existing Conditions

SAFETY PARAMETERS	FIRE SAFETY (FS)	MEANS OF EGRESS (ME)	GENERAL SAFETY (GS)
1301.6.1 Building height	1.00	1.00	1.00
1301.6.2 Building area	25.83	25.83	25.83
1301.6.3 Compartmentation	4.00	4.00	4.00
1301.6.4 Tenant and dwelling unit separations	0.00	0.00	0.00
1301.6.5 Corridor walls	0.00	0.00	0.00
1301.6.6 Vertical openings	2.00	2.00	2.00
1301.6.7 HVAC systems	5.00	5.00	5.00
1301.6.8 Automatic fire detection	6.00	6.00	6.00
1301.6.9 Fire alarm system	0.00	0.00	0.00
1301.6.10 Smoke control	****	4.00	4.00
1301.6.11 Means of egress	****	-3.00	-3.00
1301.6.12 Dead ends	****	0.00	0.00
1301.6.13 Maximum exit access travel distance	****	5.75	5.75
1301.6.14 Elevator control	-2.00	-2.00	-2.00
1301.6.15 Means of egress emergency lighting	****	0.00	0.00
1301.6.16 Mixed occupancies	0.00	****	0.00
1301.6.17 Automatic sprinklers	2.00	2.00 + 2 = 1.00	2.00
1301.6.18 Standpipes	0.00	0.00	0.00
1301.6.19 Incidental use	0.00	0.00	0.00
1301.6.20 Smoke compartmentation	0.00	0.00	0.00
1301.6.21.1 Patient ability for self-preservation ^a	****	N/A	N/A
1301.6.21.2 Patient concentration ^a	****	N/A	N/A
1301.6.21.3 Attendant-to-patient ratio ^a	****	N/A	N/A
Building score—total value	43.83	49.58	50.38

TABLE 1301.8

MANDATORY SAFETY SCORES^a

OCCUPANCY	FIRE SAFETY (MFS)	MEANS OF EGRESS (MME)	GENERAL SAFETY (MGS)
A, E	25	40	40
B	30	40	40
F	24	34	34
I-2	19	34	34
M	23	40	40
R	21	38	38

1301.6.20 Smoke compartmentation	0.00	0.00	0.00
1301.6.21.1 Patient ability for self-preservation ^a	****	N/A	N/A
1301.6.21.2 Patient concentration ^a	****	N/A	N/A
1301.6.21.3 Attendant-to-patient ratio ^a	****	N/A	N/A
Building score—total value	43.83	49.58	50.38

Compliance Methods

Comparison

Prescriptive

Work Area

Performance

Requires approval from the AHJ

Refers back to the IBC and some of its requirements

Requires building to meet some requirements for new construction

Applies to the entire building

Requires the project to meet all listed requirements

Imposes additional requirements for changes of occupancy

Provides specific exceptions for historic buildings

X	X	X
X	X	X
X		X
X		X
X	X	
X	X	
X	X	

QUESTIONS?

RESOURCES

[UpCodes: Utah Building Codes*](https://up.codes/codes/utah)

<https://up.codes/codes/utah>

[UpCodes: Existing Building Code 2018 of Utah*](https://up.codes/viewer/utah/iebc-2018)

<https://up.codes/viewer/utah/iebc-2018>

[Association for Preservation Technology International: Codes and Standards Technical Committee](https://www.apti.org/codes-and-standards)

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

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*Individual jurisdictions may have passed modified versions of the Utah code. You should always check with your local building code official to ensure you are referencing the most relevant and recent version.