

BUILDING CODE & HISTORIC BUILDINGS

PRESERVATION PATHWAYS

INTRODUCTION

WHAT IS CODE COMPLIANCE?

Building codes establish the minimum level of safety and performance to protect the public health, safety, and welfare.

PRESCRIPTIVE-BASED REQUIREMENTS

specify explicit requirements

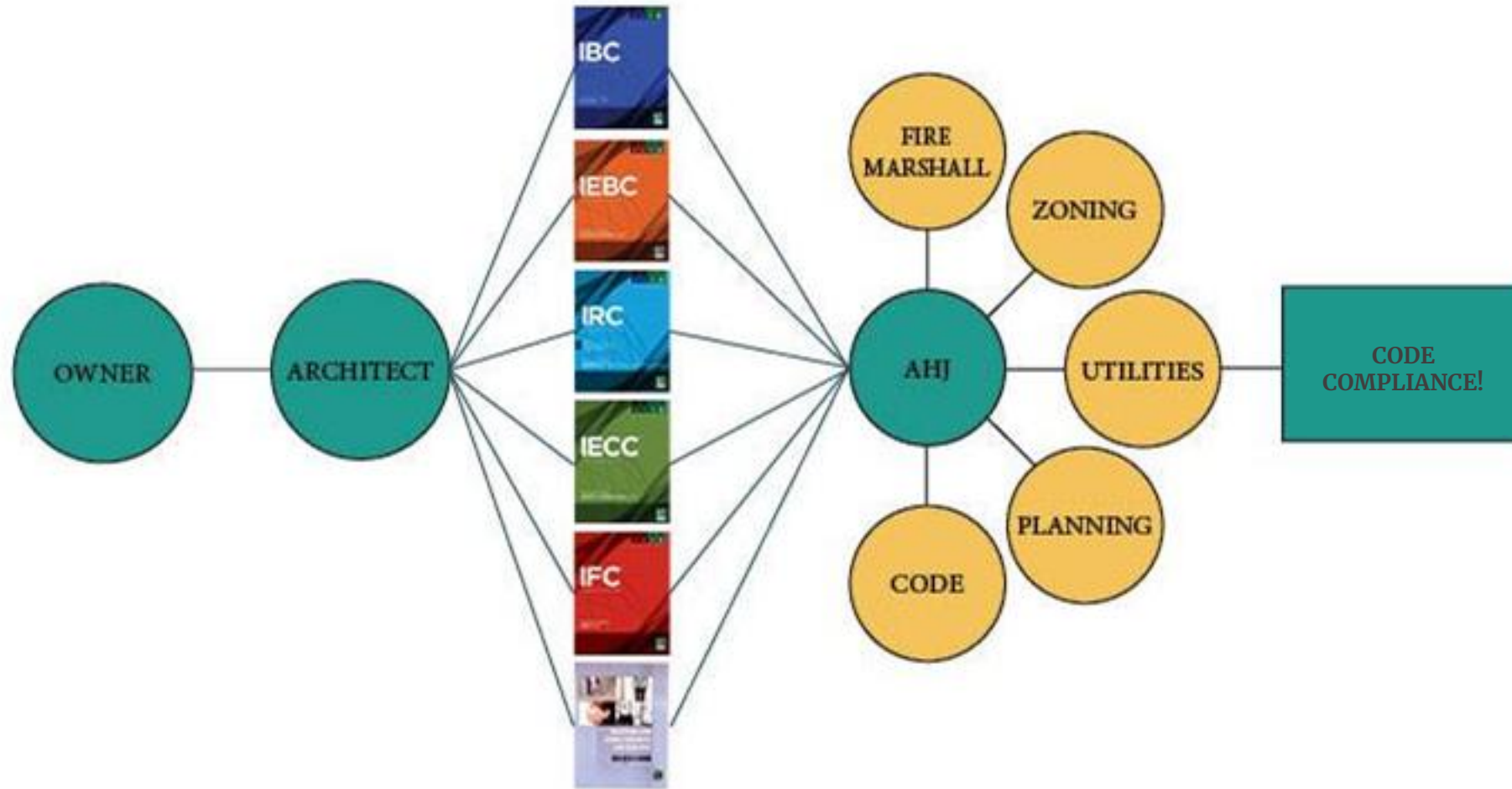
designer must incorporate specific materials and features into the design

PERFORMANCE-BASED REQUIREMENTS

specify performance goals

designer determines the materials and features that achieve goals

Process + Parties



MODEL CODES

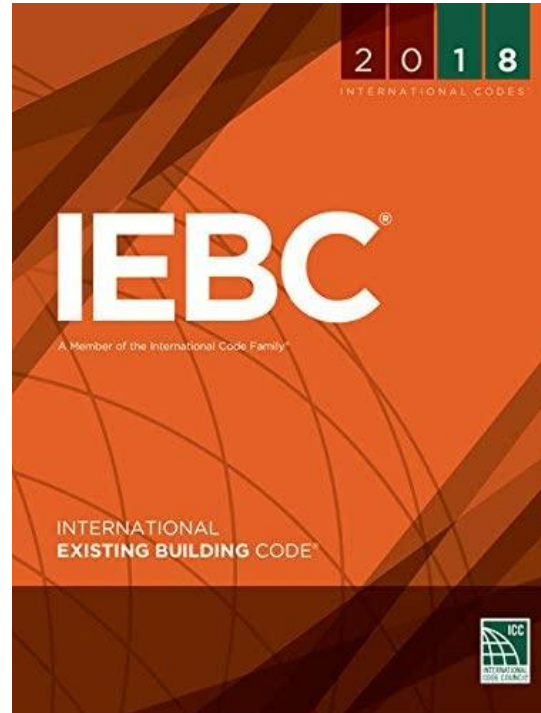
KNOW YOUR OPTIONS

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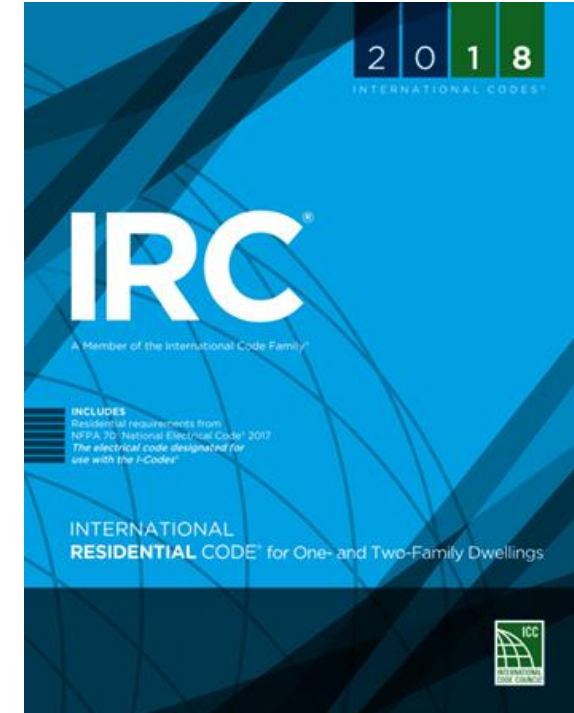
Model Codes



35 Chapters
14 Appendices



16 Chapters
1 Appendix



44 Chapters
3 Appendices

International Building Code



35 Chapters
14 Appendices

[A] 101.2 Scope

The provisions of this code shall apply to the construction, alteration, relocation, enlargement, replacement, repair, equipment, use and occupancy, location, maintenance, removal and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures.

Exception: Detached one- and two-family *dwelling*s and *townhouses* not more than three *stories above grade plane* in height with a separate *means of egress*, and their accessory structures not more than three *stories above grade plane* in height, shall comply with this code or the *International Residential Code*.

International Building Code

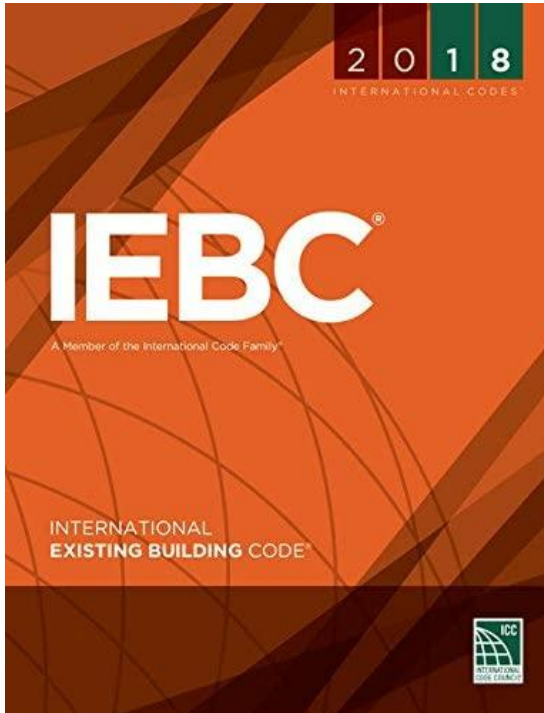


35 Chapters
14 Appendices

[A] 101.3 Purpose

The purpose of this code is to establish the minimum requirements to provide a reasonable level of safety, health and general welfare through structural strength, means of egress, stability, sanitation, light and ventilation, energy conservation, and for providing a reasonable level of life safety and property protection from the hazards of fire, explosion or dangerous conditions, and to provide a reasonable level of safety to fire fighters and emergency responders during emergency operations.

International Existing Building Code



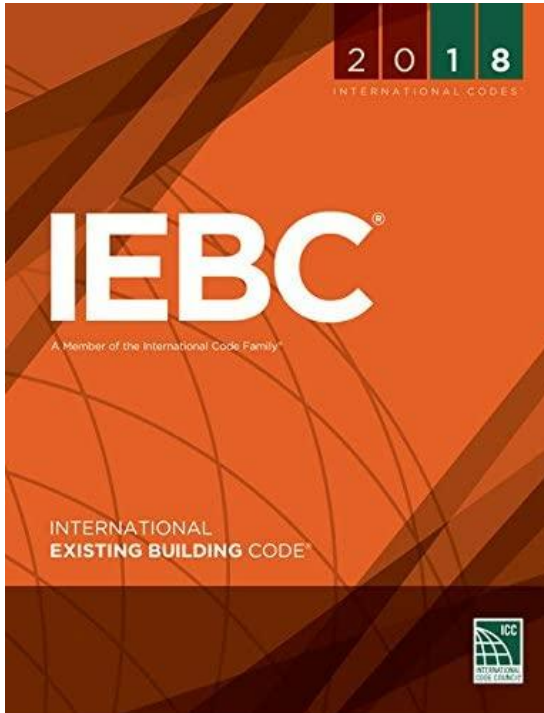
16 Chapters
1 Appendix

[A] 101.2 Scope

The provisions of this code shall apply to the *repair, alteration, change of occupancy, addition* to and relocation of *existing buildings*.

Exception: Detached one- and two-family dwellings and townhouses not more than three stories above grade plane in height with a separate means of egress, and their accessory structures not more than three stories above grade plane in height, shall comply with this code or the *International Residential Code*.

International Existing Building Code



16 Chapters
1 Appendix

[A] 101.3 Purpose

The intent of this code is to provide flexibility to permit the use of alternative approaches to achieve compliance with minimum requirements to provide a reasonable level of safety, health, property protection and general welfare insofar as they are affected by the *repair, alteration, change of occupancy, addition* and relocation of *existing buildings*.

International Residential Code



44 Chapters
3 Appendices

R101.2 Scope

The provisions of this code shall apply to the construction, *alteration*, movement, enlargement, replacement, *repair*, equipment, use and occupancy, location, removal and demolition of detached one- and two-family dwellings and three- and four- family dwellings of up to two levels and *townhouses* not more than three stories above *grade plane* in height with a separate means of egress and their *accessory structures* not more than three stories above *grade plane* in height.

International Residential Code



44 Chapters
3 Appendices

R101.3 Purpose

The purpose of this code is to establish minimum requirements to provide a reasonable level of safety, health and general welfare through affordability, structural strength, means of egress, stability, sanitation, light and ventilation, energy conservation and safety to life and property from fire and other hazards and to provide a reasonable level of safety to fire fighters and emergency responders during emergency operations.

EXISTING BUILDING CODE

FLEXIBLE CODE COMPLIANCE

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IEBC - Table of Contents

Chapter 1 - Administration

Chapter 2 - Definitions

Chapter 3 - Provisions for All Compliance Methods

Chapter 4 - Repairs

Chapter 5 - Prescriptive Compliance Method

Chapter 6 - Classification of Work

Chapter 7 - Alterations - Level 1

Chapter 8 - Alterations - Level 2

Chapter 9 - Alterations - Level 3

Chapter 10 - Change of Occupancy

Chapter 11 - Additions

Chapter 12 - Historic Buildings

Chapter 13 - Performance Compliance Methods

Chapter 14 - Relocated or Moved Buildings

Chapter 15 - Construction Safeguards

Chapter 16 - Referenced Standards

Appendix A - Guidelines for the Seismic Retrofit
of Existing Buildings

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Appendix A - Guidelines for the Seismic Retrofit
of Existing Buildings

Compliance Methods

PRESCRIPTIVE COMPLIANCE METHOD

comply with requirements of IBC

WORK AREA COMPLIANCE METHOD

comply with more or fewer requirements
depending on project size

PERFORMANCE-BASED REQUIREMENTS

comply with minimum fire safety, means of
egress and general safety thresholds

CASE STUDY

UNION BLOCK 57 S. MAIN ST. BRIGHAM CITY

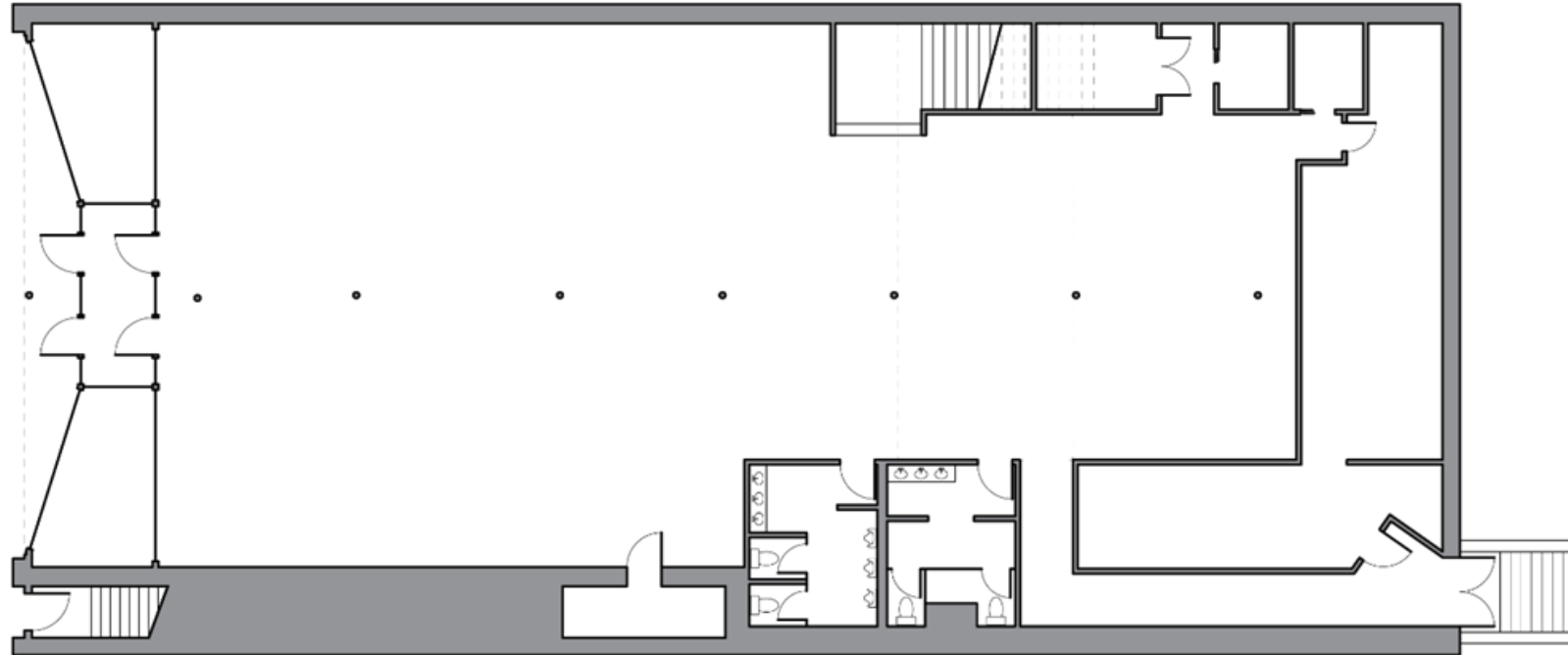
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Existing Conditions

Case Study

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

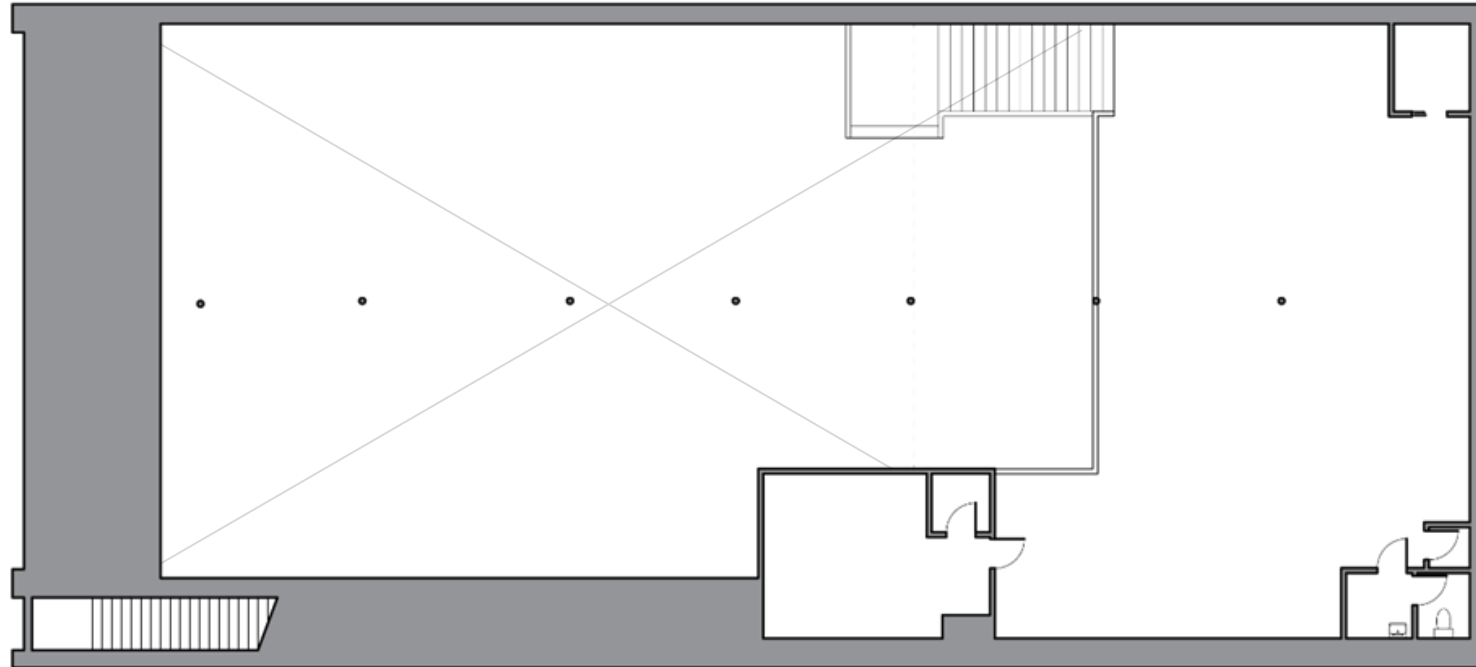


GROUND FLOOR
6,581 square feet
M Occupancy

Existing Conditions

Case Study

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

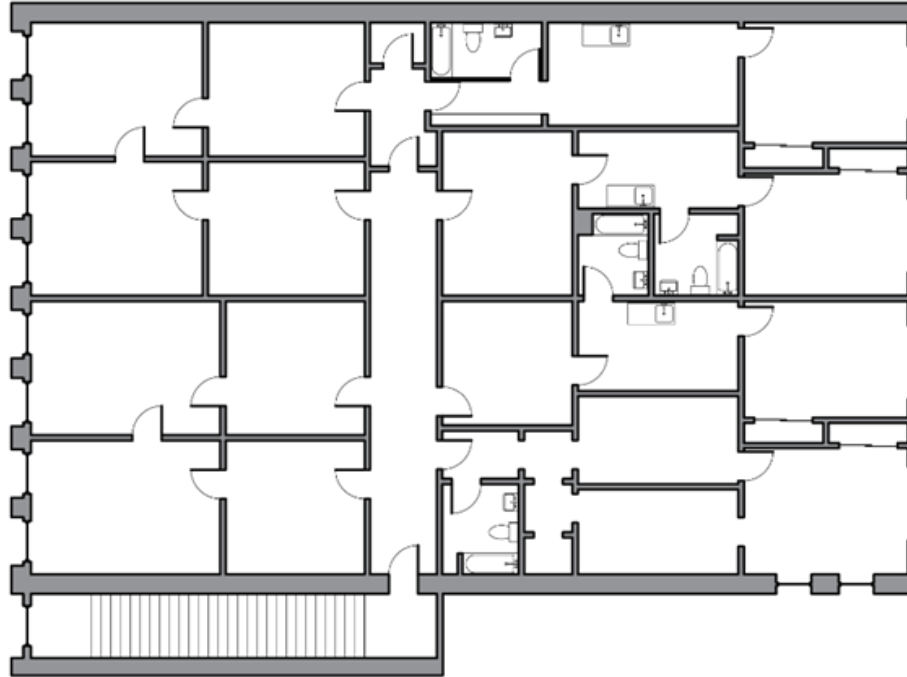


MEZZANINE LEVEL
2,063 square feet
M Occupancy

Existing Conditions

Case Study

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

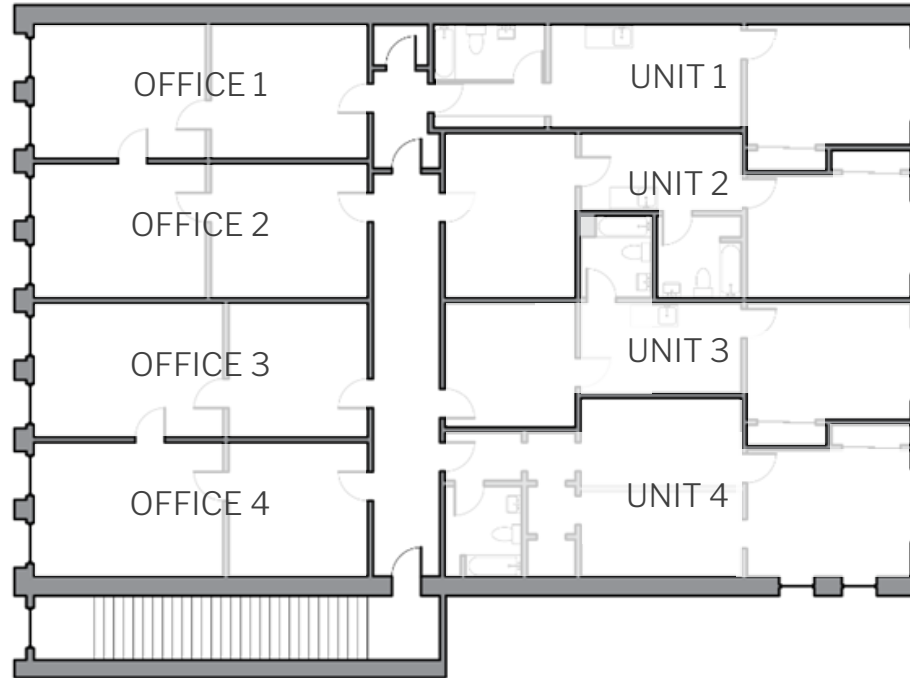


SECOND FLOOR
3,549 square feet
B Occupancy; R-2 Occupancy

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

PRESCRIPTIVE COMPLIANCE METHOD

A solid teal horizontal bar spanning the width of the slide at the bottom.

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*.

507.1 Historic Buildings

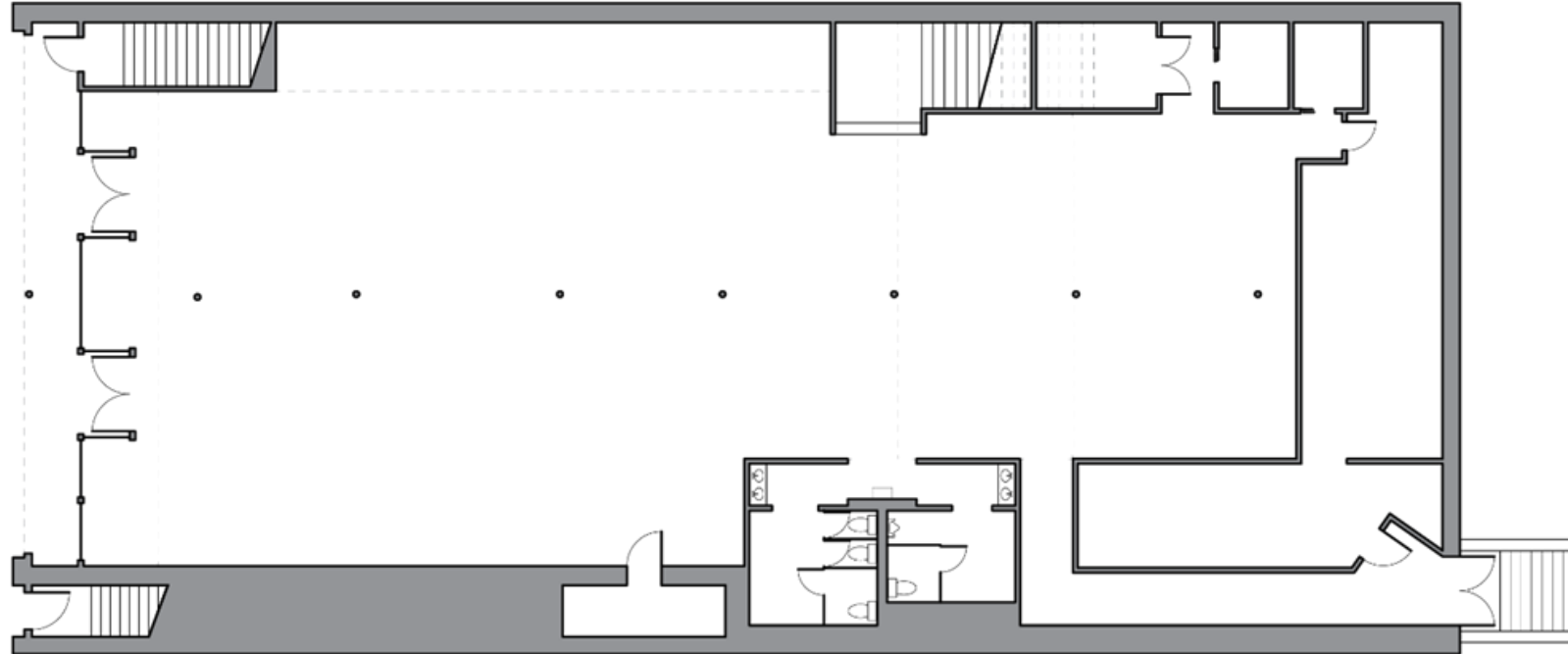
The provisions of this code that require improvements relative to a building's existing condition or, in the case of *repairs*, that require improvements relative to a building's predamage condition, shall not be mandatory for *historic buildings* unless specifically required by this section.

507.2 Life Safety Hazards

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

Required Changes

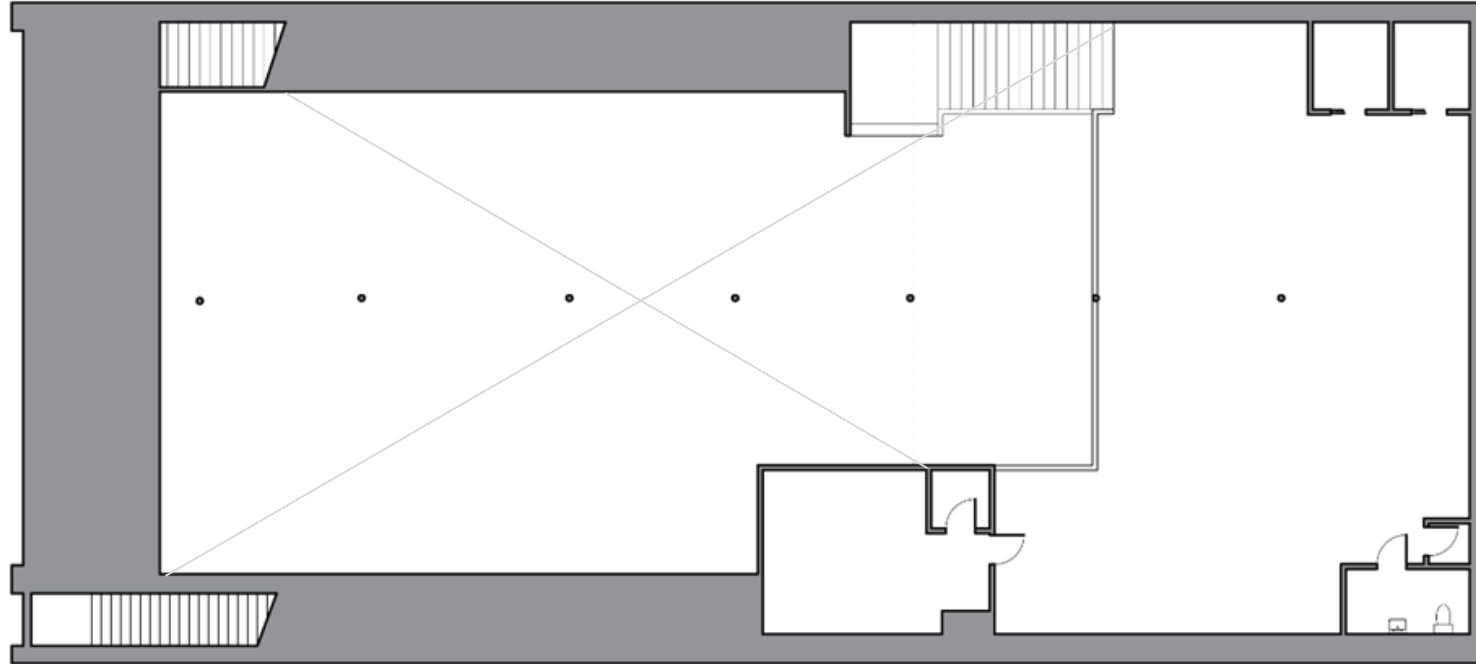
- Automatic sprinkler system throughout
- Second egress stair for residential level
- Seismic stabilization
- Major systems upgrades (HVAC, plumbing, electrical)



GROUND FLOOR
6,581 square feet
M Occupancy

Required Changes

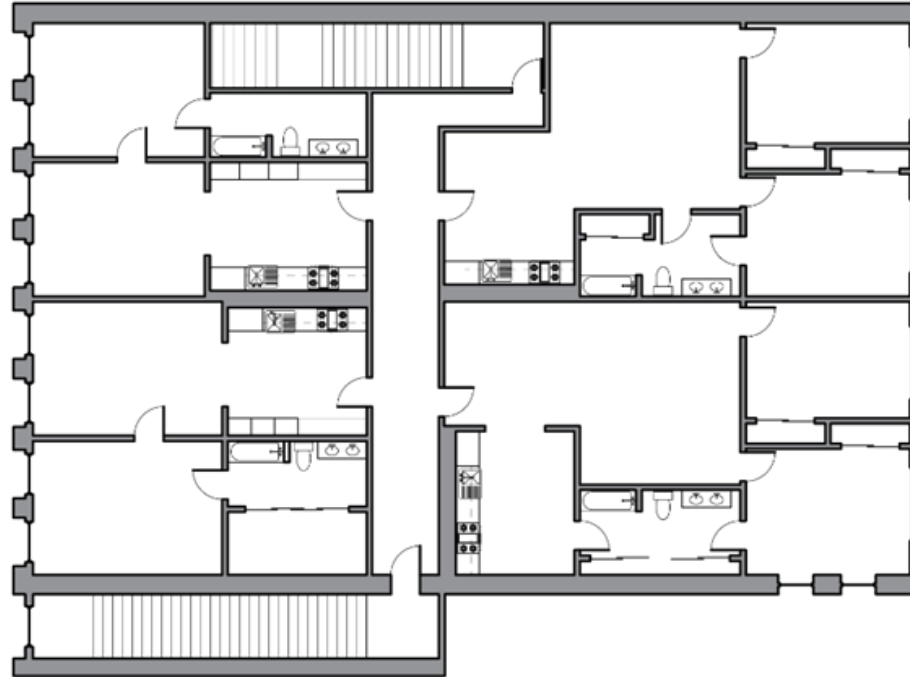
- Automatic sprinkler system throughout
- Second egress stair for residential level
- Seismic stabilization
- Major systems upgrades (HVAC, plumbing, electrical)



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

A solid teal horizontal bar spanning the width of the slide at the bottom.

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*.

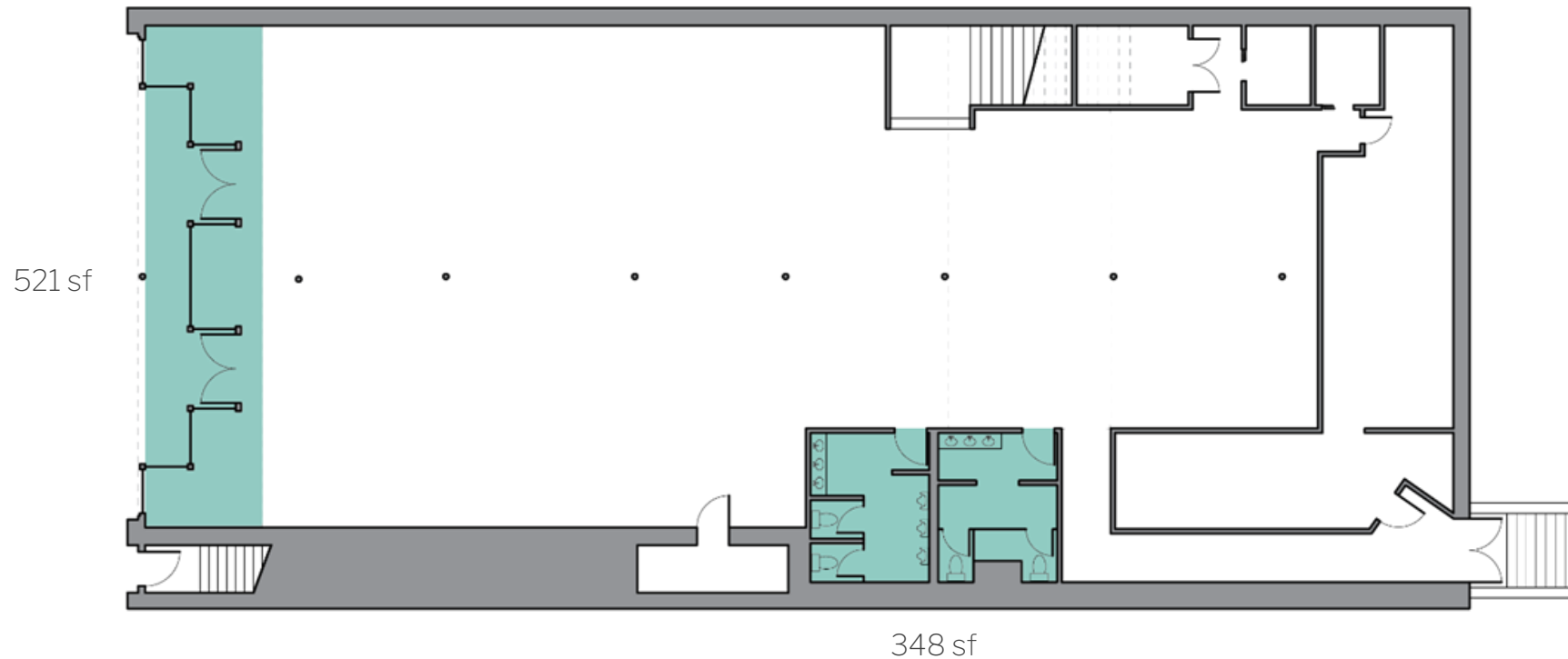
Work Area Method

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

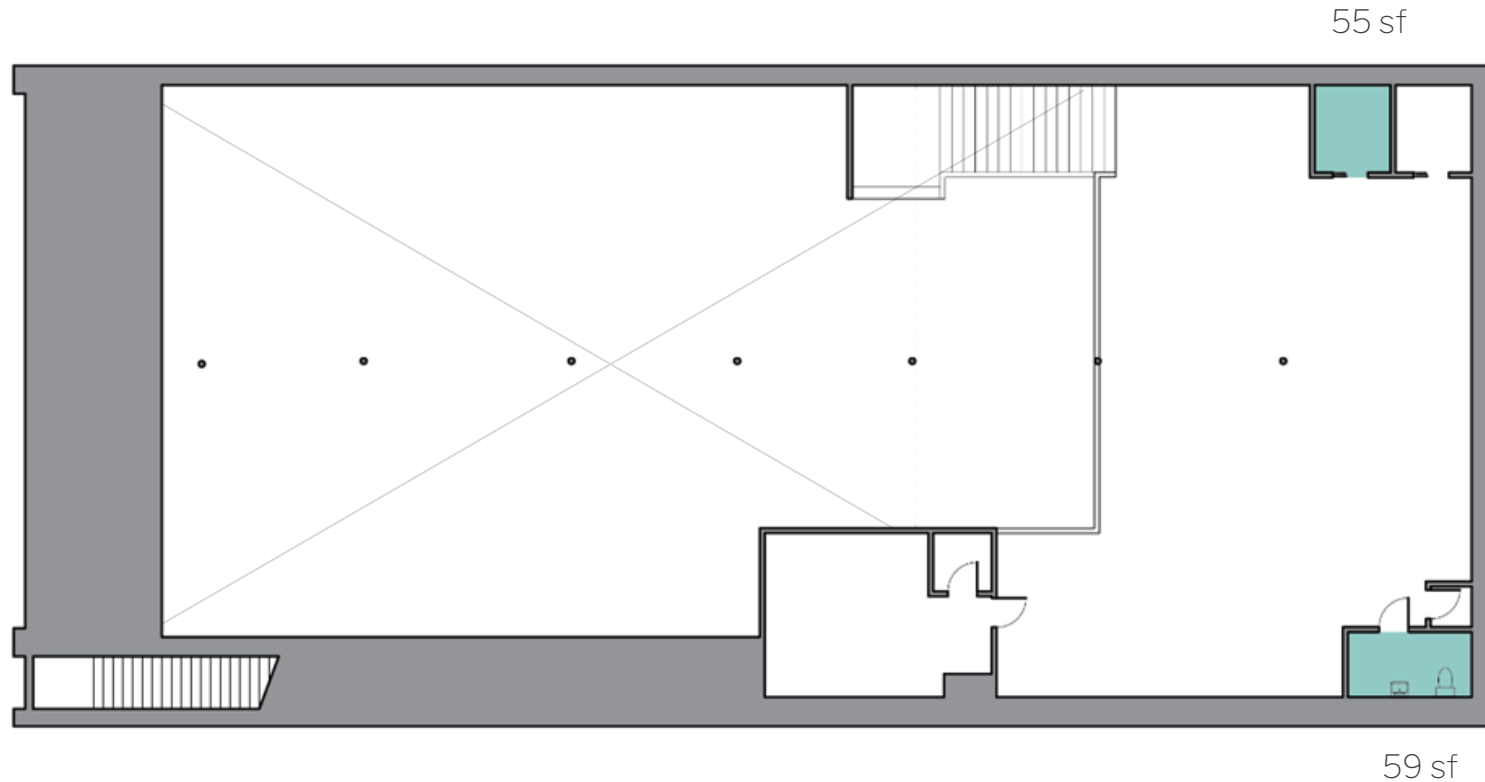
Work Area Method

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

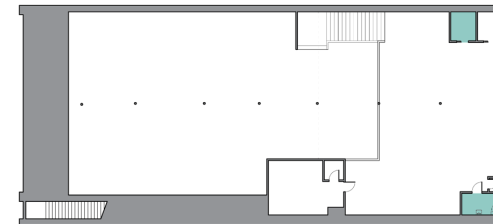
Case Study

Work Area Calculation:

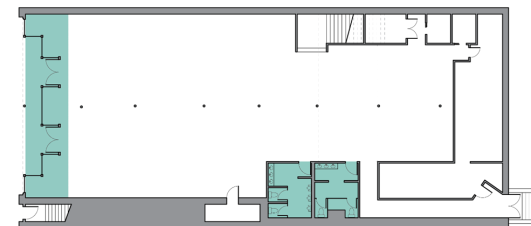
Ground Level	869 sf
Mezzanine Level	114 sf
Second Level	1,815 sf
Total Work Area	2,798 sf
Total Building Area	12,193 sf
$2,798 \text{ sf} / 12,193 \text{ sf} = 23\% \text{ of building area}$	



SECOND FLOOR



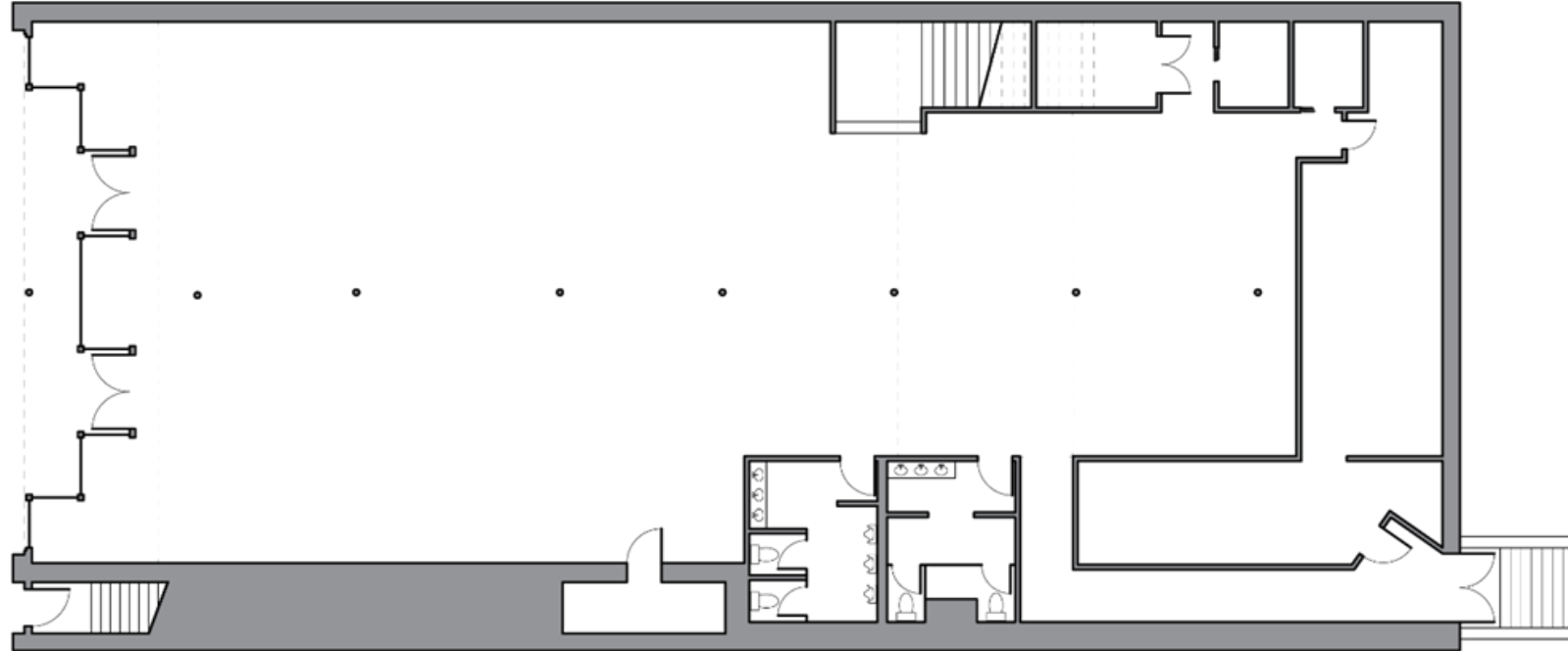
MEZZANINE LEVEL



GROUND FLOOR

Required Changes

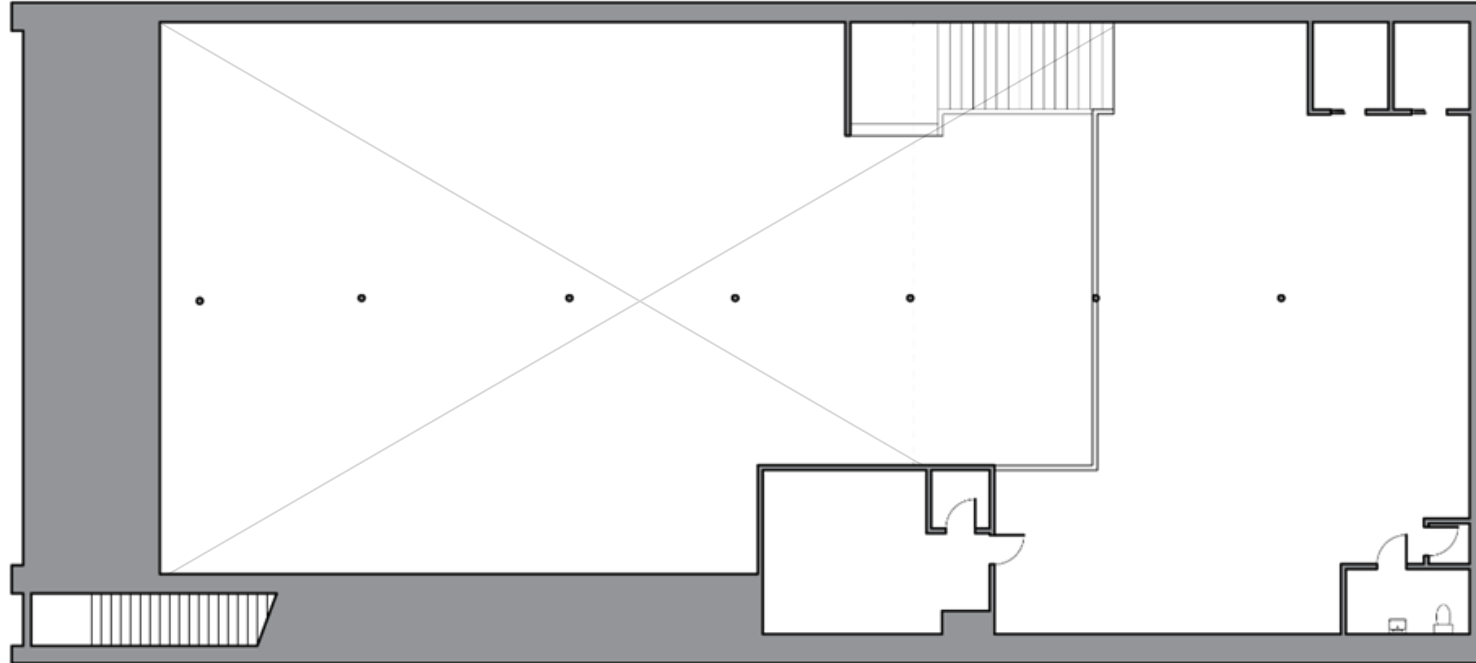
- All new materials, systems, and equipment must meet code requirements



GROUND FLOOR
6,581 square feet
M Occupancy

Required Changes

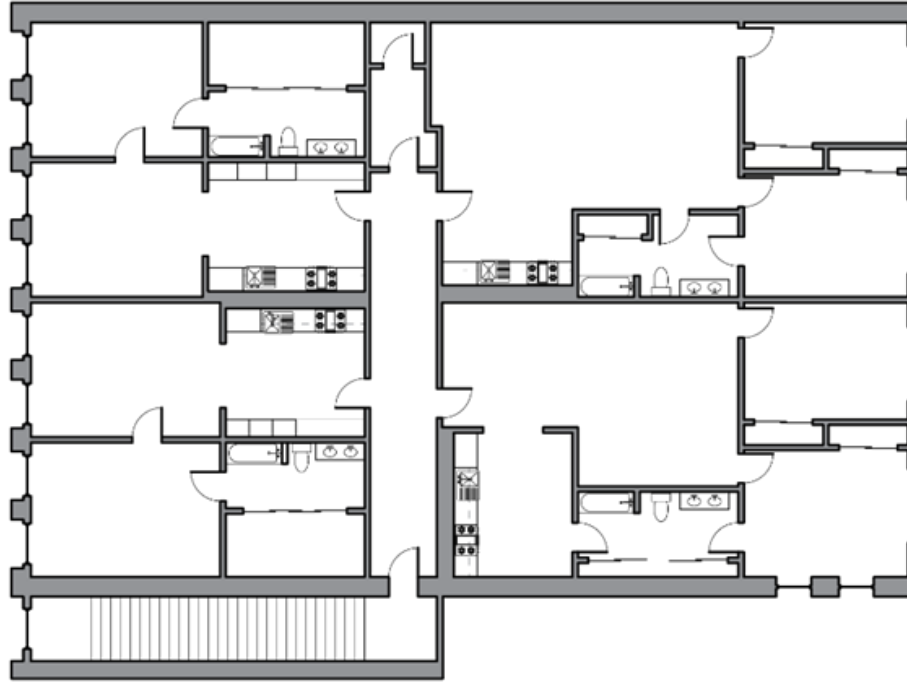
- All new materials, systems, and equipment must meet code requirements



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

A solid teal horizontal bar spanning the width of the slide at the bottom.

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.

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

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

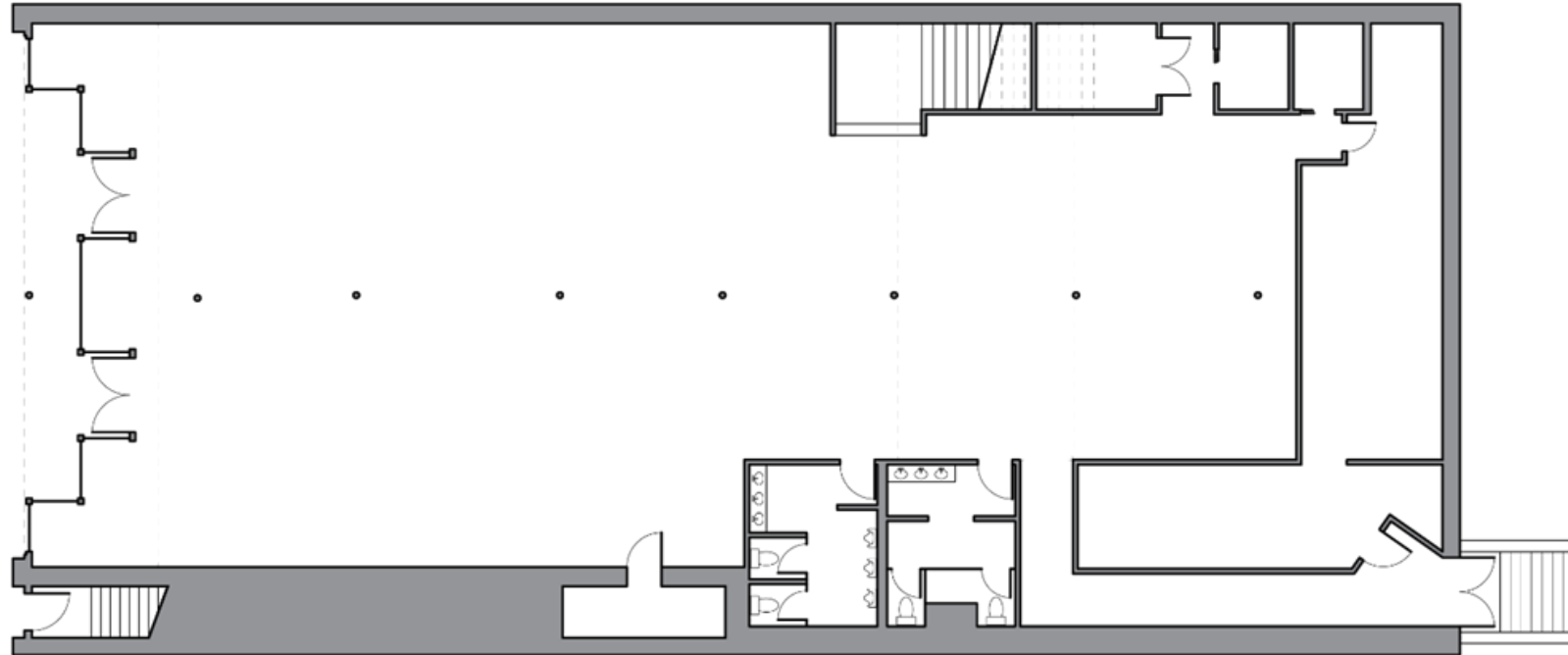
MANDATORY SAFETY SCORES^a

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

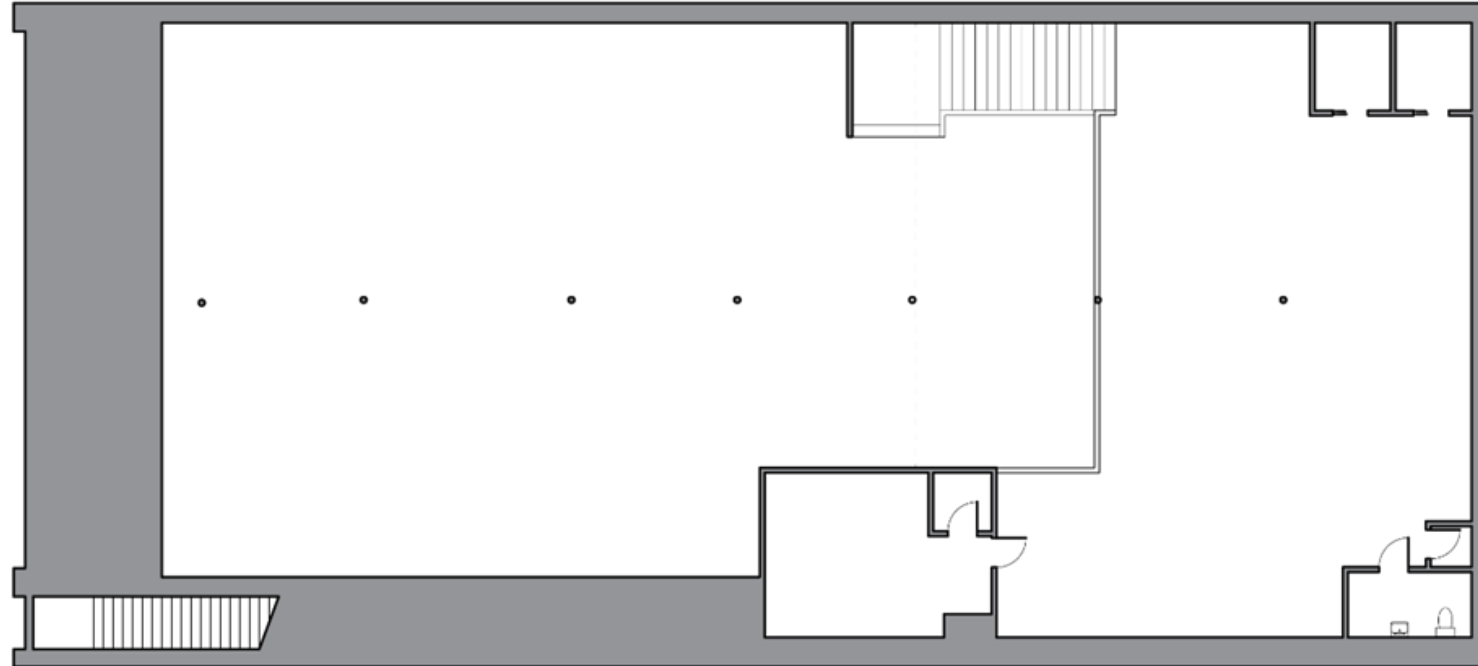
- Addition of smoke and fire detection system



GROUND FLOOR
6,581 square feet
M Occupancy

Proposed Changes

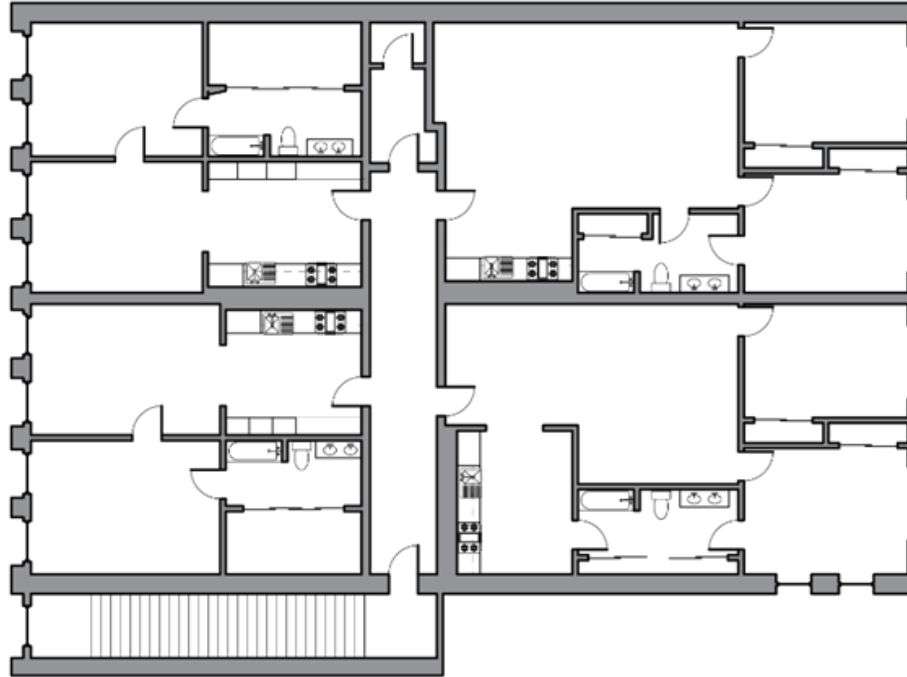
- Addition of smoke and fire detection system



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

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)
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

- 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

Prescriptive	Work Area	Performance
X	X	X
X	X	X
X		X
X		X
X	X	
X	X	
X	X	

FINAL WORD

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RESOURCES

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

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

[UpCodes: Existing Building Code 2021 of Utah*](https://up.codes/viewer/utah/iebc-2021)

<https://up.codes/viewer/utah/iebc-2021>

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

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

[Preservation Brief 51: Building Codes for Historic and
Existing Buildings](https://www.nps.gov/orgs/1739/upload/preservation-brief-51-building-codes.pdf)

<https://www.nps.gov/orgs/1739/upload/preservation-brief-51-building-codes.pdf>

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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.