

PROJECT DESCRIPTION:

Existing Circa 1921 two story wood-framed building with two apartments to be renovated and existing unfinished ground floor (walk-out basement) apartment to be completed. A single business occupance will be fit-up in currently vacant space, and storage space will be created in basement. Total gross building area c.7,600 s.f.

TEN PIN LLC

2 ISLAND AVE
PEAKS ISLAND, ME 04108

CODE STUDY

IEBC 2009
IBC 2009
NFPA-101 2009

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Code Criteria	IBC 2009	NFPA-101 2009	Findings
(IBC Chapters highlighted green)			(Relevant interpretations/conclusions highlighted red)
IEBC - Alteration Level 3	§405.1		Where the work area exceeds 50% of the aggregate area of the building. Shall conform with IEBC Chapter 8.
			All altered areas shall comply with the requirements of the IBC save where exempted by IEBC chapter 8.
NFPA-101 - Building Rehabilitation		§43.5.2.3	Where total area of rehabilitation in a modification exceeds 50% of the area of the building the work area will be considered a reconstruction.
		§43.5.1.3	Newly constructed elements and systems shall comply with the requirements for new construction.
		§43.6.4.1	In a building with rehabilitation work areas involving over 50% of the aggregate building area, sprinklers shall be provided on the highest floor containing a rehabilitation work area and on all floors below (if required for new construction for the occupancy)
			Rehabilitation work shall comply with requirements for new construction. Sprinklers required in use groups where they would be required for new construction.
Primary Use and Occupancy Classification	Ch.3		
IBC - Group R-2	§310.1		Apartment House
IBC - Group B	§304.1		Business Group
IBC - Group S-1			Moderate-Hazard Storage
NFPA - 101 New Apartment Building		Chapter 30	A building containing 3 or more dwelling units with independent cooking and bathing facilities.
NFPA - 101 New Business Occupancies		Chapter 38	An occupancy used for the transaction of business other than mercantile.
NFPA - 101 New Apartment Building		Chapter 42	An occupancy used primarily for the storage or sheltering of goods.
Special Requirements R-2	Ch. 4		
Separation walls	§420.2		Walls separating dwelling units and or sleeping units from each other and from other occupancies contiguous to them shall be fire partitions per Section 709.
Horizontal separation	§420.3		Floors separating dwelling units and or sleeping units from each other and from other occupancies contiguous to them shall be horizontal assemblies per Section 712.
Building Heights and Areas	Ch. 5		
Mixed use and occupancy	§508		
Separation of occupancies	table 508.4	table 6.1.14.4.1	Required separation of occupancies:
			Business & Residential = 2 HR (reduced to 1-HR w sprinklers throughout).
			Storage-1 & Residential = 2 HR (reduced to 1-HR w sprinklers throughout).

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			Storage Moderate Hazard & Business =2 HR (reduced to 1-HR w sprinklers throughout). None Required by IBC
			Mixed-Use Separated: Each occupancy shall be separated from the others by 1 HR assembly and the building sprinklered throughout.
Types of Construction	Ch. 6		
Type V-B construction	table 601		Existing construction. combustible unprotected
Fire Resistance Ratings for exterior walls based on Fire Separation Distance.	table 602		0 HR rated where greater than 10' from lot line.
Fire and Smoke Protection Features	Ch. 7		
Classification of Hazards		§30.1.5	"Ordinary" hazard per 6.2.2
Hazardous Areas		§30.3.2.1	Shall be protected per Section 8.7
		table 30.3.2.1.1	Boiler and fuel fired heater rooms serving more than one dwelling unit: 1 HR plus sprinklers.
Vertical Separation		§8.6	
Floor smoke barriers		§8.6.1	Every floor that separates stories shall be constructed as a smoke barrier. Openings shall comply with Chapter 8 & 30 requirements.
Openings	§705.8		exception #2: Buildings whose exterior walls and primary structural frame are not required to be fire resistance rated shall be permitted to have unlimited unprotected openings.
	table 705.8		When fire separation distance >30' no limit to opening percentage.
Enclosure and protection of stairs		§7.2.2.5.1.2	Inside stairs, other than those serving as an exit component, shall be protected in accordance with Section 8.6
Fire resistance ratings for enclosure of floor openings		§8.6.5	Less than 4 stories new construction: 1HR fire barrier.
Fire Partitions	§709.1		Walls separating dwelling units per 420.2
	§709.3		Rating: Fire Partitions shall have 1 HR rating.(1/2 HR w sprinklers)
	§709.4		Continuity: Fire Partitions shall extend from foundation/floor assembly to roof/ceiling assembly and shall be securely attached to them. Void space between ceiling & deck above firestopped.
			Walls separating dwelling/sleeping units shall be 1/2 HR with 20 minute doors.
Horizontal Assemblies	§712.1		Walls separating dwelling units per 420.3
	§709.3		Rating: Horizontal assemblies separating dwelling/sleeping units shall be minimum of 1 HR (1/2 HR with sprinklers throughout).
	§712.4		Continuity: Joints in or between horizontal assemblies shall be firestopped (per section 714.4)

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	§12.6		Joints: Horizontal assemblies separating dwelling/sleeping units shall be minimum of 1 HR (1/2 HR with sprinklers throughout).
Smoke Barriers	§710.3		Smoke Barriers shall have 1 HR rating.
Smoke Partitions	§711.3		Unless otherwise required, no rating necessary.
Opening Protectives	§715.4.3		Door assemblies shall have 20 min. rating in cooridor walls.
			Horizontal assemblies separating occupancies shall be 1HR rated.
Concealed Spaces			
Fire Blocking	§717.1		Fire blocking and draftstopping shall be installed in combustibile concealed locations.
	§717.2.1		Fire blocking materials shall be 2" nominal lumber, 1/2" gwb, 1/4" cement board, secured mineral fiber batts, or other approved material.
	§717.2.2		In concealed wall spaces install fireblocking (1.) vertically at ceiling and floor levels and (2.) horizontally at intervals not exceeding 10'
	§717.2.5		At ceiling and floor openings the annular space around vents, pipes, ducts, etc. shall be firestopped.
Draftstopping	§717.3		In combustibile construction, draftstopping shall be installed to subdivide floor/ceiling assemblies.
INTERIOR FINISHES			
Interior wall and ceiling finish requirements	Table 803.9		Group R-2, sprinklered
			Rooms & enclosed spaces: Class C
		§30.3.3.2	Spaces other than exit enclosures & corridors: Class C
	Table 803.9		Group B, sprinklered
			Rooms & enclosed spaces: Class C
		§38.3.3.2	Spaces other than exit enclosures & corridors: Class C
	Table 803.9		Group S, sprinklered
			Exits enclosures & passageways: Class C
			Corridors: Class C
			Rooms & enclosed spaces: Class C
		§42.3.3.2	Storage Spaces: Class C
FIRE PROTECTION SYSTEMS			
Detection, Alarm, and Communication Systems		§30.3.4.1	Required in apartment buildings four or more stories or eleven or more units.
Automatic Sprinklers	§903.2.8		An automatic sprinkler system shall be provided in all buildings with a Group R fire area.
Domestic service	§903.3.5.1		Where domestic service provides water supply following shall apply:
	§903.3.5.1.1		Limited area sprinkler systems limited to <20 sprinklers on any single connection are permitted permitted to be connected to domestic water service.

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	§903.3.5.1.1		The domestic service shall be capable of supplying the simultaneous domestic and sprinkler demand required to be hydraulically calculated.
Automatic Sprinklers		§30.3.5.1	All buildings shall be protected throughout by an approved supervised automatic sprinkler system.
		§30.3.5.2	Four or fewer stories above grade NFPA-13R sprinklers permitted.
		§30.3.5.3	Not required in closets <12s.f. Required in all closets w/ equipment (washer, dryer, water heater).
		§30.3.5.5	Listed quick-response or listed residential sprinklers required.
			Sprinkler system shall be installed throughout building. NFPA-13R allowed in R-2.
Portable Fire Extinguishers	§906.1		Shall be installed in new and existing R-2 occupancies.
Portable Fire Extinguishers for Class A	table 906.3.1		Ordinary (moderate) hazard occupancy: Minimum rated single extinguisher: 2-A Maximum floor area per unit A: 1,500 s.f. Maximum floor area for Extinguisher: 11, 250 s.f. Maximum travel distance to extinguishers: 75'
		§30.3.5.12	Required in hazardous areas.
Fire Alarm System	§907.2.9.1		Group-R: Shall be installed where: (1.) any dwelling or sleeping unit is 3 or more stories above level of exit discharge. Group-B: Shall be installed where: occupant load>500.
			Fire Alarm system not required.
Smoke Alarms	§907.2.9.2		Shall be installed in accordance with 907.2.11
	§907.2.11.2		In Group R-2 shall be installed in following locations: (1.) on ceiling or wall outside of each separate sleeping area in immediate vicinity of bedroom, (2.) in each room used for sleeping purposes, (3.) in each story of dwelling unit including basement.
	§907.2.11.3		Smoke detectors in each dwelling unit shall be interconnected.
	§907.2.11.4		Power supply for smoke detectors shall be the building wiring with battery backup.
Smoke Alarms		§30.2.1.1	Shall be installed in accordance w/ 9.6.2.10 in every sleeping area, outside every sleeping area in immediate vicinity of bedrooms, and on all levels including basement.
MEANS OF EGRESS	Ch. 10	Ch. 30 & 7	
Means of Egress			
		§30.2.1.1	Shall comply with NFPA-101 Chapter 7.
Ceiling height	§1003.2	§7.1.5	7'- 6" minimum. (6'-8" at projections).
Elevation change	§1003.6		Slope required for rise less than 12". Exception #1: R-2 single step w/ max 7" rise. Exception #2: R-2 2 risers, 13" tread min, handrail one side.
Continuity	§1003.6		The path of egress travel along a means of egress shall not be interrupted by any building element other than a means of egress component.

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			The required capacity of a means of egress system shall not be diminished along the path of egress travel.
Slip Resistance		§7.1.6.4	The walking surfaces shall be slip resistant under the foreseeable conditions.
Occupant Load	§1004		As determined by per unit area factor in table 1004.1.1 or where approved by AHJ the actual number of occupants for whom each occupied space is designed.
	table 1004.1.1	table 7.3.1.2	Residential: 200 gross s.f./occupant
			Residential: 100 gross s.f./occupant
			Storage: 300 gross s.f./occupant
		§30.1.7	In accordance with table 7.3.1.2 or the maximum probable population of the space, whichever is greater.
Egress width	§1005.1		The total width of means of egress shall not be less than the occupant load served by the means of egress multiplied by .0.3" per occupant for stairways and by 0.2" per occupant for other egress components.
Means of Egress Capacity		table 7.3.3.1	Stairways 0.3 in/person. Level components 0.2 in/person.
Means of Egress illumination	§1006.1		The means of egress shall be illuminated at all times the building space is occupied. Exception #3: Dwelling units in Group R-2
		§130.2.8	per Section 7.8
Means of Egress illumination emergency power	§1006.3		In the event of power supply failure, an emergency electrical system shall automatically illuminate: (1.) aisles & unenclosed rooms & stairways in buildings that require two means of egress, (2.) corridors, exit enclosures, & exit passageways in building required to have two exits, (3.) exterior egress components in building required to have two exits, (4.) exterior landings in buildings required to have two exits.
Means of Egress doors	§1008.1		Shall be readily distinguishable from the adjacent construction and finishes such that the doors are easily recognizable as doors.
Door width	§1008.1.1		Minimum width 32" clear door face to stop. Exception #1: Does not apply to R-2 doors not
		§7.2.1.2.1	Measured at narrowest point in opening from door leaf to stop.
		§7.2.1.2.3.2	Not less than 32" clear. (1.) When pair of doors provided, one shall be 32" (2.) Exit access door assemblies serving <70 s.f. shall be not <24" door leaf width. (3.) Door openings serving portion of building not required to be accessible shall be permitted to be not less than 28".
Door hanging	§1008.1.2		Shall be pivot or hinge swing. Exception #4: Doors serving single dwelling unit in group R-2. Exception #9: Manually operated sliding doors if occupant load <10.
Floor elevation	§1008.1.5		Floor landing each side shall be at same elevation. Exception #2: Exterior doors as provided
		§7.2.1.3.1	Floor landing each side shall not vary by more than 1/2" each side.
		§7.2.1.3.5	Existing buildings where exit discharges to exterior can be one step, not to exceed 8" rise.

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Means of Egress doors		§30.3.6.2	20 minute rating required in exit access corridors.
		§30.3.6.2.3	Shall be self-closing and self-latching.
		§7.2.1.5.1	Shall be readily opened from egress side.
		§7.2.1.5.2	Shall not require use of key, tool, or special knowledge to operate from egress side.
Sliding doors		§7.2.1.14	Horizontal-sliding door assemblies shall be permitted in the means of egress.
Means of Egress Stairways			
Width	§1009.1		Not less than 44". Exception #1: Not less than 36" with occupant load <50.
Width		§7.2.2.2.1.2	Not less than 36" with occupant load <50.
Headroom	§1009.2	§7.1.5.3	Minimum 80"
Treads & risers	§1009.4		Riser 7" max, Tread 11" min. Exception #5: within R-2 dwelling units 7 3/4" max riser & 10" min tread.
Vertical rise	§1009.7		Not greater than 12' per flight.
Landings		§7.2.2.3.2.3	Landing depth shall not be less than the stair width.
Tread & landing surface		§7.2.2.3.1	Shall be solid without perforations.
Exit Signs	§1009		Required at exits and exit access doors. Exception #1: Not required in rooms or areas that require only one exit. Exception #2: Not required at main exterior exit doors that are clearly identifiable (as approved by AHJ). Exception #3: Within group R-2 dwelling units.
Handrails	§1012		
Handrail requirement	§1009.12		Shall have handrails on each side. Exception #2: Within dwelling units and spiral stairs one side permitted. Exception #3: Decks that have a single change in elevation where the landing depth on each side of the change in elevation is greater than what is required do not require handrails. Exception #5: Changes in room elevation of 3 or fewer risers within R-2 dwelling units do not require handrails.
		§7.2.2.4.1.1	Egress stairs shall have handrails both sides.
		§7.2.2.4.1.6	Existing stairs & stairs within dwelling units shall be permitted to have handrail one side.
Height	§1012.2		34" - 38" above nosing
		§7.2.2.4.4.1	34" - 38" above nosing (30"-38" in existing stairs).
Graspability	§1012.3		In group R-2 shall be Type-I with 1 1/4" - 2" diameter or equivalently graspable.
Continuity	§1012.4		Handrail graspable surface shall be continuous without interruption by newel posts or other obstructions. Exception #1: Within dwelling units permitted to be interrupted by newel post.
		§7.2.2.4.4.2	Handrails shall continue for full flight of stairs. Inside handrails shall be continuous at landings.
Handrail extensions	§1012.6		Handrail extensions shall return to wall or be continuous. Shall extend 12" at top riser & one tread beyond bottom riser. Exception #1: within dwelling unit permitted to extend only to top and bottom riser.

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		§7.2.2.4.4.9	New handrails shall return to wall or floor or terminate in newel post.
		§7.2.2.4.4.10	Within dwelling unit handrail shall extend to directly above top & bottom riser.
		§7.2.2.4.4.11	In other than dwelling units non-continuous handrails shall extend 12" beyond top riser & continue to slope one tread beyond bottom riser.
Guards	§1013		Required at open sided walking surfaces >30" above floor or grade below.
Height	§1013.2		Min. 42" above walking surface. Exception #1: Within R-2 dwelling units guards on open sides of stairs not <34"
		§7.2.2.4.5.2	Not less than 42" high. (Ex'g not less than 36").
Opening Limitations	§1013.3		Shall not allow passage of 4" sphere. Exception #1: 4 3/8" from 36"-42" above floor. Exception #2: 6" at stair riser. Exception #3: 4 3/8" sphere within R-2 dwelling unit.
		§7.2.2.4.5.3	4" sphere not pass to 34" height. 6" at stair riser.
Exit and Exit Access	§1014		
Egress through intervening spaces	§1014.2.1		Egress from a room or space shall not pass through adjoining or intervening rooms or areas, except where such areas and the area served are accessory to one or the other and provide a discernible path of egress travel.
	§1014.2.3		Egress from dwelling units shall not pass through other sleeping areas or bathrooms.
	§1014.2.4		Egress not pass through kitchens or storage rooms. Exception #1: Not prohibited through kitchen area serving adjoining rooms constituting part of same dwelling unit.
Arrangement of means of egress		§7.5.1.2	Corridors shall provide exit access without passing through any intervening rooms other than corridors, lobbies, and other spaces permitted to be open to the corridor, unless provided for in 7.5.1.2.1 and 7.5.1.2.2.
		§7.5.1.2.1	Existing corridors that require passage through a room to access an exit shall be permitted to be used provided that the (1) path of travel is marked in accordance with 7.10 and (2) doors to such rooms comply with 7.2.1.
		§7.5.1.2.2	Corridors that are not required to be fire rated shall be permitted to discharge into open floor plan areas.
Exit and exit access doorways	§1015.1		Two exits or exit access doorways required if occupant load exceeds table 1015.1.
	table 1015.1		Group R-2 maximum occupant load for single exit = 10.
			Group B maximum occupant load for single exit = 49.
			Group S maximum occupant load for single exit = 29.
Exit separation distance	§1015.2	§7.5.1.3.3	The separation distance of the exit doors shall not be less than one half of the length of the maximum overall diagonal dimension of the area served (one third with sprinklers).
		§7.5.1.3.1	Exits shall be remotely located from each other and be arranged to minimize the possibility that more than one has the potential to be blocked by any one fire or other emergency condition.
		§7.15.1.3.5	In existing buildings the exits shall be exempt from the diagonal measurement separation distance provided that such exits are remotely located in accordance with Section

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Exit Access Travel Distance	§1016		The maximum length of exist access travel, measured from the most remote point within a story to an exterior exit door or exit enclosure shall not exceed distances in Table 1016.1
	table 1016.1		Group R-2 = 250 ft. with sprinklers throughout building
			Group B = 300 ft. with sprinklers throughout building
Corridors	§1018		
Corridor rating	§1018.1		Exception #2: 0 HR rating within R-2 dwelling unit
	table1018.1		0 HR rating group R-2 with occupant load <10.
Corridor width	§1018.2		Minimum 44". Exception #2: 36" with occupant load <50.
Dead End Corridors	§1018.4.2		The dead end in a corridor shall not exceed 20' (50' w/ sprinklers).
Number & Continuity of Exits	§1021		
General	§1021.1		All spaces within each story shall have access to minimum number of approved independent exits per table 1021.1.
			Exception #4: In group R-2 one means of egress permitted w/ max. occupant load of 20 where dwelling unit is sprinklered throughout.
Minimum number	table1021.1		Minimum two exits per story for occupant load <500
Number of exits		§30.2.4.1	Every dwelling unit shall have access to at least two separate exits remotely located as per 7.5.1.
Single exit spaces	§1021.2		Occupancies shall be permitted to have single exit if areas served do not exceed the limitations of table 1021.2.
		§30.2.4.2	Single exit permitted if: (1.) Dwelling unit has an exit door opening directly to yard at grade. (2.) Dwelling unit has direct access to outside stair that complies w/ 7.2.2
			Ground floor apartment allowed to have single exit.
Occupant load & travel distance for single exit	table 1021.2		Group R-2 basement or first story: 10 occupants 75'. Group R-2 second story: 4 dwelling units 50'
Exit enclosures	§1022.1		1 HR fire rating when connecting 3 stories or fewer.
			Exception #3: Stairways serving & contained within a single residential dwelling unit in Group R-2 not required to be enclosed.
Exit passageway width	§1023.2		Occupant load <20 width = 36" (44" width otherwise)
Exterior Stairways	§1026		
General	§1026.2		Shall be permitted as an element of required means of egress in buildings <6 stories.
Open side	§1026.3		Shall be open on at least one side.
Side yards	§1026.4		Open areas adjoining exterior stairs shall be yards, courts, or public ways.
Location	§1026.5		Shall be in accordance with 1027.3
Exit discharge	§1027.1		Shall be directly to grade.
Emergency Escape & Rescue	§1029.1		In addition to mease of egress, provisions shall be made for emergency escape & rescue in Group - R occupancies. Basements and sleeping rooms below the 4th story above grade plane shall have at least one emergency escape & rescue opening.

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			Exception #6: Not required from basements or rooms that have an exit that opens directly to yard or exterior exit balcony that opens to a public way.
Minimum size	§1029.2		Minimum net clear opening of 5.7.s.f. (5 s.f. at grade).
Opening constraints	§1029.2.1		Minimum clear opening height 24" & width 20"
Opening height	§1029.3		Max height not greater than 44" above floor.
Operational constraints	§1029.4		No special keys or tools required.
Means of Escape		§30.2.1.2	Shall comply with 24.2.2.3 (for 1&2 family dwellings).