Reviewed for Code Compliance
Inspections Division
Approved with Conditions
Date: 05/02/18

123 CUMBERLAND AVE.
PORTLAND, ME 04101

PHASE I
CODE STUDY

IEBC 2009
IBC 2009
NFPA-101 2009

PROJECT DESCRIPTION:

Renovation of owner's second and third floor dwelling unit in existing three unit apartment building. Also included in are minor improvements to first floor unit (kitchen & bath). Ground floor (walk out basement) unit to remain as existing. Scope of renovation to owner's unit includes complete demolition and replacement of interior partitions and systems, new windows, and addition of two shed dormers. Also included in the project is a two level elevated deck and the replacement of an existing entry at the ground and first floor apartments.

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1-Mar-18

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Code Criteria	IBC 2009	NFPA-101 2009	Findings
(Chapters highlighted green)			**(Notable relevant interpretations/conclusions highlighted red)**
Primary Use and Occupancy Classification	Ch.3	Ch.30	
IEBC - Alteration Level 2			The reconfiguring of space, the addition or elimination of any door or window, the reconfiguring or extension of any system, or the installation of any additional equipment. Shall conform with IEBC Chapter 7.
			All new construction on floor 1 shall comply with the requirements of the IBC save where exempted by IEBC chapter 7.
IEBC - Alteration Level 3			where the work area exceeds 50% of the aggregate area of the building. Shall conform with IEBC Chapter 8.
			All new construction on floos 2 & 3 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.
		§43.6.4.1	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)
			Rehabiltation work shall comply with requirements for new construction. Sprinklers required throughout.
IBC - Group R-2	§310.1		Apartment House
NFPA - 101 New Apartment Building		Chapter 30	A building containing 3 or more dwelling units with independent cooking and bathing facilities.
		Chapter 31	Existing Apartment building
Special Requirements IBC Group 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.
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.

It appears the distance to the lot line on the east side is less than 10'. New walls will need to be rated and openings limited.

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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.
			Boiler room shall be have 1 HR enclosure
Projections	§705.2		Projections shall not project more than 1/3 the distance from exterior face of wall to the lot line where protected openings or a combination of protected and unprotected openings are required.
	§705.2		Projections in Type V construction shall be of any approved material.
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. Existing enclosures in existing buildings: 1/2HR.
			Existing front stair from owner's shall be separated from first floor apartment by ~~30 minute~~ partition. 1 hour
Shaft Enclosures	§708		Openings through a floor/ceiling assembly shall be protected by a shaft enclosure.
Fire Partitions	§709.1		Walls separating dwelling units per 420.2
Exception 2 applies only with full NFPA 13 system	§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 roor/ceiling assembly and shall be securely attached to them. Void space between ceiling & deck above firestopped.
Horizontal Assemblies	§712.1		Walls separating dwelling units per 420.3
Exception applies only with full NFPA 13 system	§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)
	§12.6		Joints: Horizontal assemblies separating dwelling/sleeping units shall be minimum of 1 HR ~~(1/2 HR with sprinklers throughout)~~.

CITY OF PORTLAND, MAINE RESURGAM
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			Horizontal assemblies separating dwelling/sleepingunits shall have ~~30 min.~~ 1 hour 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.
Concealed Spaces			
Fire Blocking	§717.1		Fire blockingand draftstoppingshall be installedin combustible concealed locations.
	§717.2.1		Fire blockingmaterials 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.) verticallyat ceiling and floor levelsand (2.) horizontallyat 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 combustible construction, draftstoppingshall be installedto subdivide floor/ceiling assemblies.
Interior Finishes	**Ch. 8**		
Interior wall and ceiling finish requirements	Table 803.9		Rooms & enclosed spaces: Class C
		§30.3.3.2	Spaces other than exit enclosures and corridors: Class C
Fire Protection Systems	**Ch. 9**		
Automatic Sprinklers	§903.2.8		An automatic sprinklersystem shall be provided throughout all buildings with a Group R fire area.
Domestic service	§903.3.5.1		Where domestic service provides water supply followingshall apply:
	§903.3.5.1.1		Limited area sprinklersystems limited to <20 sprinklerson any single connection are permitted permitted to be connected to domestic water service.
	§903.3.5.1.1		The domestic service shall be capable of supplyingthe simultaneouls domestic and sprinklerdeman required to be hydraulicallycalculated.
Automatic Sprinklers		§30.3.5.1	All buildings shall be protected throughout by an approved supervised automatic sprinkler system.
		§30.3.5.2	Four of fewer stories above grade NFPA-13R sprinklerspermitted.
		§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 sprinklersrequired.
			NFPA-13R sprinklersshall be provided throughout.
Portable Fire Extinguishers	§906.1		Shall be installedin new and existing R-2 occupancies.
Portable Fire Extinguishers for Class A fire	table 906.3.1		Ordinary (moderate) hazard occupancy:
			Minimum rated single extinguisher: 2-A
			Maximum floorarea per unit A: 1,500 s.f.

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			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		Shall be installed where: (1.) any dwelling or sleeping unit is 3 or more stories above level of exit discharge.
Detection, Alarm, and Communication Systems		§30.3.4.1	Required in apartment buildings four or more stories or eleven or more units.
			Fire alarm system not required.
Smoke Alarms	§907.2.9.2		Smoke alarms 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.
		§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.
			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 forseeable 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.
			Residential: 200 gross s.f./occupant
	§1004.8		Outdoors areas shall be provided with a means of egress. Occupant load determined by intended use as approve by AHJ.
		§30.1.7	In accordance with table 7.3.1.2 or the maximum probable popluation of the space, whichever is greater.
		table 7.3.1.2	Apartment buildings: 200 gross s.f./person

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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 multipliedby .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 illuminatedat all times the building space is occupied. Exception #3: Dwellingunits 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 electiricalsystem shall automatically illuminate: (1.) aisles & unenclosed roooms & stairways in buildings that require two means of egress, (2.) corridors, exit enclosures, & exit passsageways 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.
			Constant illumination or emergency lighting not required.
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 part of means of egress.
		§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 dwellingunit 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 for in section 1003.5
		§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.
Means of Egress doors		§30.3.6.2	20 minute rating required in exit access corridors.
		§30.3.6.2.3	Shall be self-closingand 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-slidingdoor 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.

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Headroom	§1009.2	§7.1.5.3	Minimum 80"
Treads & risers	§1009.4		Riser 7" max, Tread 11" min. Exception #5: within R-2 dwellingunits 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 dwellingunits.
Handrails	§1012		
Handrail requirement	§1009.12		Shall have handrails on each side. Exception #2: Within dwellingunits 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 treater than what is required do not require handrails. Exception #5: Changes in room elevation of 3 or fewer risers within R-2 dwellingunits 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 dwellingunits 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 dwellingunits 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 extentions	§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 dwellingunit permitted to extend only to top and bottom riser.
		§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 dwellingunit handrail shall extend to directly above top & bottom riser.
		§7.2.2.4.4.11	In other than dwellingunits 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 dwellingunits 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").

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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 dwellingunit.
		§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 adjoing 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 dwellingunits 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 dwellingunit.
			First floor egress through kitchen permitted.
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.
			Group R-2 maximum occupant load for single exit = 10. Exception: In R-2 occupancies one means of egress is permitted within and from individual dwellingunits with a maximum occupant load of 20 where the dwellingunit is equipped throughout with sprinklers.
			Single exit permitted from owner's 2nd & 3rd floor unit.
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		R-2 200 ft. (250 ft. with sprinklers throughout building)
Corridors	§1018		
Corridor rating	§1018.1		Exception #2: 0 HR rating within R-2 dwelllingunit
	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.

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			Exception #4: In group R-2 one means of egress permitted w/ max. occupant load of 20 where dwellingunit is sprinkleredthroughout.
Minimum number	table1021.1		Minimum two exits per story for occupant load <500
Number of exits		§30.2.4.1	Every dwellingunit 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.) Dwellingunit has an exit door opening directly to yard at grade. (2.) Dwellingunit has direct access to outside stair that complies w/ 7.2.2
			Single exit permitted from first floor and basement units.
Maximum 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 dwellingunits 50' Group R-2 third story: 4 dwellingunits 50'
			Local AHJ will allow travel distance of 125' per IBC 2012 to be exercised therby allowing a single exit from owner's 2nd & 3rd floor unit.
Exit enclosures	§1022.1		1 HR fire rating when connecting 3 stories or fewer.
			Exception #3: Stairways serving & contained within a single residential R-2 dwellingunit not required to be enclosed.
			Existing front stair serving floors 2 & 3 not required to be enclosed
Exit passageway width	§1023.2		Occupant load <20 width = 36" (44" width otherwise)
Emergency Escape & Rescue	§1029.1		In addition to means 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.
			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		Mimimum 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).
			Emergency escape & rescue windows provided at 1st & 2nd floor bedrooms.