21. Fire Safety Plan & Code Summary

Enclosed are a summary / analysis of the following building and fire codes:

1. NFPA 1 - 2006
2. IBC - 2015 + NFPA 101 - 2009

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Date: September 28, 2017
Project: Front Street Development
Client: Front Street Redevelopment, LP

CODE ANALYSIS

Architecture
& Planning

115 Kingston St.
Boston, MA 02111
utiledesign.com

Applicable Codes and Regulations

	Local Code	Model Code
Building	MUBEC	2015 IRC and IBC
Energy Code		2015 IECC
Mechanical		2013 ASHRAE
Plumbing	ME State Plumbing Code	IAMPO 2000 Uniform Plumbing Code
Electrical		NEC 2011
Radon		ASTM E-1465-08A
Life Safety		NFPA 101 - Life Safety Code
		NFPA 211 2003 (Chimneys, etc.)
		NFPA 1 - Fire Prevention Code
Accessibility and Fair Housing	2016 - Maine State Housing Authority- Quality Standards and Procedures Manual (2016-MSHA)	
	State Fair Housing - Maine Human Rights Act	
	Americans With Disabilities Act	
	Accessible and Usable Buildings and Facilities ICC / ANSI A-117.1 2009	
	Fair Housing Act (design manual)	
	Section 504	
	Uniform Physical Conditions Standards (UPCS)	

USE AND OCCUPANCY CLASSIFICATION

	Apartments	
IBC 2015, Chapter 3, Section 310.4	**R-2**	Sleeping units with more than two dwellings, primarily permanent in nature
	Community Center	
IBC 2015 Chapter 3, Section 303.4	**A-3**	Community Halls
	Storage	
IBC 2015, Chapter 3, Section 311.2	**S-1**	Moderate Hazard
IBC 2015 Chapter 3, Section 311.1.1	**Accessory Storage**	Less than 100 SF, aggregate area not to exceed limits in Section 508.2
IBC 2015, Chapter 5, Section 503.1.2, IBC 2015, Chapter 5, Section 508	Buildings on the Same Lot	
IBC 2015, Chapter 4, Section 424	Children's Play Structures	

OCCUPANCY ALLOWABLE BUILDING HEIGHT

Construction Type	**Type VA**		
Occupancy	**A-3**	**R-2**	**S-1**
Sprinkler System	NFPA-13	NFPA-13	NFPA-13
Allowable Height (IBC 2015, T504.3)	60'-0"	60'-0"	60'-0"
Allowable Stories (IBC 2015, 504.4)	2	3	3
Allowable Area (IBC 2015, T506.2)**	34,500 SF (I-Story)	36,000 SF	42,000 SF

**The allowable area listed does not include an area increse; the maximum allowable area increase will not exceed the current area of each building.

NFPA-13 system allows for 36,000SF at R-2 occupancy and VA construction.

Fire Resistant Construction

FIRE RESISTANT CONSTRUCTION

IBC 2015, Chapter 4, Section 420.2	Separtation Walls:	Dwelling unit separtion walls shall be constructed as FIRE PARTITIONS (See Section 708)
IBC 2015, Chapter 4, Section 420.3	Horizontal Separation:	Dwelling Unit Separtion floors shall be constructed as HORIZONTAL ASSEMBLIES (See
IBC 2015, Chapter 5, Section 509	Incidental Uses	See for furnace and boiler limitations.

FIRE SUPPRESSION SYSTEM

IBC 2015, Chapter 4, Section 420.5	Automatic Sprinkler System	Equiped through out in accordance with SECTION 903.2.8, QUICKRESPONSE 903.3.2
Narrative	The building shall be fitted with fully automatic and supervised sprinkler systems. Provide design and components as necessary to meet NFPA 13 and local codes. Zone supervision will be provided for each story. Fire department connection type and location shall be per Portland Fire Department requirements. A hydrant flow test will be performed to confirm the municipal water supply.	

2016-MSHA SMOKE ALARMS

IBC 2015, Chapter 4, Section 420.6	Fire Alarm & Smoke Alarms	Fire and smoke alarms shall be provided in accordance with SECTION 907.2.6, 907.2.8, 907.2.9, 907.2.10.

FIRE-RESISTANCE RATING REQUIREMENTS

Table 601	Primary Structural Frame	1 Hour
	Bearing Walls	1 Hour
	Floor Construction	1 Hour
	Roof Construction	1 Hour
Section 711.2.4.3, exp.	Unit Horizontal Separation	1/2 Hour
Section 708.3, exp.2	Unit Separation Walls	1/2 Hour
Section 708.3, exp 1	Corridor Walls	1/2 Hour
Table 508.2.5	Boiler Rooms over 400,000 BTU/Hr	1 Hour or Sprinkered
Table 508.2.5	Laundry Rooms over 100 SF	1 Hour or Sprinkered
Table 508.2.5	Waste Collection over 100 SF	1 Hour or Sprinkered
Table 716.5	Opening, Corridor Doors	1/3 Hour

Means of Egress and Dimensional Requirements

IBC 2015, Chapter 10, Section 1007.1.1	1/3 separation distance with automatic sprinkler system		
Section 1011.2	44" minimum stairway width		
Table 1020.2	44" minimum corridor width		
IBC 2015, Chapter 12, Section 1208.2	Occupiable Ceiling Hts	7'-6"	
	Other Ceiling Heights	7'-0"	Bathrooms, Kitchens, Storage, Laundry, and Corridors

Energy Code

ENVELOPE EFFICIENY

IECC 2015	Climate Zone: 6		
		Req'd	Provided
2016-MSHA		Whole Building Blower Door Testing	Air seal each unit and test each unit.
IBC 2015, Chapter 12, Table 1203.3	Unvented Attics and Unvented Enclosed Rafter Assemblies	R-25 Air Impermeable Insulation	R-26 Air Impermeable Insulation

IECC 2015, T402.1.2 Required R-Values

	Req'd	Provided (Insulation Only)
Fenestration U-Factor	U-0.32	to meet or exceed req'd
Roof	R-49	R-58 (26+32)
Exterior Walls	R-20+5 or R13+10	R-40
Mass Walls	R-20	R-39
Floor	R-30	N/A
Slab on Grade	R-10	R-20

HVAC EMISSIONS REQUIREMENTS

The building HVAC will utilize Mitsubishi "Hyperheat" electric heat pumps with variable speed compressors. There will be no fossil fuel HVAC. The domestic hot water will be heated by high-efficiency natural gas water heaters with direct venting to the outside.

Sound Attenuation Requirements

Unit to Unit Floor and Wall Assemblies

IBC 2015, SECTION 1207	Req'd	Provided	
STC (non-site tested)	50		Dwelling and Sleeping Unit Separation
IIC (non-site tested)	50		Dwelling and Sleeping Unit Separation

Elevaotors

Section 713.4	Shaft Construction	1 Hour
Section 3006.2	Elevator Lobby Separation	Not required, connects 3-stories or less
Section 1009.2.1	Elevator Required in Accessible Means of Egress	Not required, accessible floor less that 4-stories above the level of exit discharge
Section 3002.4	Car Size	Not required to accommodate ambulance stretcher, connects less than 4-stories
Section 403.6.1	Fire Service Access	Not required less than 120 feet

NFPA 1 - Code Analysis

Use Group

6.1.8.1.5	Apartment Building	99 Total Units
6.1.2.1	A-2 Assembly	

Fire Protection Markings

10.12.1.1	Premises shall be marked
10.12.2	Shaftways to be Marked for Fire Safety
10.12.3	Stairway Identification

Building Construction

12.2	Construction: Shall comply with this section and refereced codes.

Fire Ratings

12.7.1	Fire Barriers per NFPA 101

Opening Protection	Wall	Door
Table 12.7.4.2	Corridors	1/3 hour
	1-Hour Barriers	3/4 hour
	1-Hour Shafts and Exits	1 hour
	2-Hour Shafts and Exits	1.5 hour

Occupant Load	Occupancy	
Table 14.8.1.2	Residential	1/200 GSF
	Assembly, Unconcentrated	1/15 Net
	Business Areas	1/100 GSF

Means of Egress	Capacity Factor	
Table 14.8.3.1	Stair	0.3 in per person
	Other	0.2 in per person

Marking of Means of Egress

14.14	Per section

Fire Suppression

13.3.2.15.2	NFPA 13R	IBC Governs

Stand Pipes

13.2.2	Not required

Fire Alarm System

13.7.1	Fire alarm system requirements

Smoke Detectors

13.7.2.11.3	in every sleeping area, outside every sleeping area, and on all levels of the dwelling unit.

Extinguishment Requirements

13.6	Portable Fire Extinguishers	

Elevators Lobby

149.1.6.1	Shall have access to at least one exit.

Accessibility	See section 14.10.4
1410.4.1	Shall not have less that two accessible means of egress.

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CITY OF PORTLAND DESIGN MANUAL APPLICABLE DESIGN STANDARDS

a. Design Relationship to Site

Site Design and Vegetation Selection: The site organization of the buildings relates to and enhances the local context. The buildings are outward facing and set back to mimic adjacent neighbors. Parking areas have been pulled away from primary street edges to give way for more building frontage. A new driveway transects the east site. This new drive is designed to mimic the width of Presumpscot Street and has parallel parking for a street like feel.

Presumpscot Street bisects the developments; speeding local traffic on this street has been a point of concern from the neighborhood. The new design calls for a raised cross walk for traffic calming. This addresses the concern and stitches together the two sides of the development.

The buildings ground floor elevations and entries are located to fit into the existing topography.

The concept for the site pedestrian movement is to create a network of paths. Shared outdoors spaces are located along the pedestrian path network; some of these spaces are a central green, play areas, exterior spill out space from the community building, and a central plaza that leads people to a new street crossing to Payson Park. This pedestrian network and outdoor features are designed to encourage and invite both the Front Street and neighborhood residents through the development instead of around the Front Street development.

Vegetation has been selected from indigenous drought tolerant varieties , and the design is to enhance and strengthen the local street tree and wooded character of the neighborhood. The existing condition have approximately sixteen 'specimen' trees, while the proposed design will increase that count to at least fifty new trees. The pedestrian network is also enhanced by the new planted landscape concept.

Stormwater Management: Surface stormwater from roofs parking areas and green space will be directed towards multiple rain garden areas dispersed throughout the site. These rain gardens will be underdrained and designed to remove pollutants and sediment and to cool stormwater before it is discharged into the Back Cove, which discharges to Casco Bay. In general, the existing surface drainage patterns will be retained. Overflows from the rain gardens during heavy rain events will drain into catch basins. During extreme rain events, the rain gardens will overflow to the surface and the site will be graded to direct overflows towards the roadways and away from the buildings.

The site's existing stormwater system is connected to the City's combined drainage system, which is often overwhelmed during heavy rain events, resulting in Combined Sewer Overflows (CSO), the discharge of untreated sewerage into Casco Bay. The proposed stormdrain system will be completely separate from the sewer system, which will reduce the strain on the combined sewer system during heavy rains and, in turn, help to reduce the duration and frequency of CSO's.

Please see the Stormwater Management Narrative and attachments for additional information.

Disaster Prevention through Flood Resiliency: In order to prevent damage from flooding events, the building finish floor elevations will be at least 2.7 feet above FEMA's proposed Base Flood Elevations. Also, the site will be graded such that during extreme rain/flooding events, stormwater will overflow into the adjacent streets well before reaching the level of building finish floor elevations.

b. Internal Design Character and Relationship to Surrounding Neighborhood: The massing concept of the residential buildings meaningfully engages with the scale and residential fabric of the neighborhood. The height of the buildings undulates between two and three stories, and this is in keeping with the neighborhood's residences. The base massing of the residential buildings is two stories, and has features that echo the scale and variety found in the neighborhood. The projected and raised features animate the building facade, and give the space between the scale of a two story colonial home. Porches have been added to give the project a townhouse feel and encourage conviviality with neighbors.

c. Recreational Open Space

1. *External Buffers;* Recreational open spaces are buffered from neighboring homes with the proposed buildings and screening plant elements.
2. *Internal Buffers:* Ornamental trees screening, like amelanchier, is used between walkways and residential units at the interior elevations. At the street side facades, larger trees, like tulip trees, and grass strips are used to buffer ground floor residential units from the public sidewalk.
3. *Passive recreation open space:* A variety of recreation elements are integrated into the site design, like benches, lawn areas, covered spill out space from the community building, and shaded seating areas.
4. *Active recreation open space:* The proposed project feature multiple play areas, a central lawn for field play, and an improved connection to Payson Park.
5. *Private open space:* Ground floor units feature stoops to encourage convivality with neighbors.

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PORTLAND FIRE DEPARTMENT SITE REVIEW CHECKLIST

Client
Front Street Housing Revelopment, LP
c/o Portland Housing Development Corporation
14 Baxter Boulevard
Portland Maine 04101
207 773-4753

Architect
Utile, Inc.
115 Kingston Street
Boston, Massachusetts 02111
617 423-7200

1. See attached code report for building uses.
2. See A2.1 to A2.6 for building areas per story.
3. See A2.1 to A2.6 for elevations.
4. See attached code report for proposed fire protection.
5. See C4.1 to C4.2 for proposed hydrant locations
6. See C4.1 to C4.2 for water main size and locations
7. Access to all structures is provided on at least two sides.
8. See attached code summary