

CODE ANALYSIS

15 West Street Proposed Residential Board and Care Portland, ME



Prepared for:

Jacob Gelles

June 8, 2017

INTRODUCTION

Triangle Fire Consultants (*TFC*) has prepared this report to evaluate the existing townhouse at 15 West Street in Portland, ME for the proposed use as a living facility for persons with mental impairments. The report is based on information provided by Mr. Jacob Gelles (the *Client*) on existing conditions and the intended use of the building. The intent of this letter is to provide a Code Review for this proposed occupancy, and is provided at the request of Mr. Jason Grant, City of Portland (the AHJ). Accessibility and/or licensure requirements were not reviewed as part of this report.

APPLICABLE CODES

This evaluation has been developed considering the requirements of the following applicable codes and standards:

1. The State of Maine adopts NFPA 1: *Uniform Fire Code* (2006 edition) and NFPA 101: *Life Safety Code* (2009 edition). The State of Maine also recognizes the following alternate versions of the following NFPA documents:
 - a. Fire Alarm Code: NFPA 72 (2007 edition)
 - b. Sprinkler Code: NFPA 13 and 13R (2016 editions)
 - c. Carbon Monoxide Detection: NFPA 720 (2009 edition) with amendments
2. The Maine Uniform Building Code, which adopts The International Building Code (IBC) (2009 edition) with amendments.
3. City of Portland, ME general ordinances; specifically, Chapter 10 *Fire Prevention and Protection*.

A review of Chapter 10 revealed that the City of Portland has adopted the rules and regulations of the State Fire Marshal, with multiple amendments, including the adoption of the 2009 edition of the Uniform Fire Code, NFPA 1.

CONSTRUCTION AND OCCUPANCY OBSERVATIONS

The property under analysis is an existing townhouse-style occupancy built in 1905, with three stories plus an unfinished basement. This townhome is the center unit of a three-unit building, and all units are currently of residential use. The subject townhouse is given as 3,273 ft², with 1,012 ft² per floor, and is used currently as a single-family residence. Construction observations include a brick exterior, brick/masonry demising walls lathe/plaster coverings, other interior wood partitions, and a flat roof, most closely resembling Type IIIB construction. Each unit is of varying height, and the brick demising partition extends to the roof deck in each case, eliminating the possibility of a common cockloft across the building.

The planned use for the building is as a residential home for developmentally disabled adults. The Client has stated that no occupants will have physical disabilities; that 8-12 young adults would reside with one live-in staff member for the purpose of counseling and teaching life skills to help the residents live independently. Based on this information provided by the client, the occupancy type most closely resembles the Residential Board and Care occupancy type, governed by Chapter 32 of NFPA 101 *Life Safety Code (LSC)*, and further classifies it as a *small facility* (with sleeping accommodations for not more than 16 residents). Similarly, the IBC refers to this type of occupancy as R-4, which includes buildings arranged for occupancy as residential care/assisted living facilities including more than five but not more than 16 occupants, excluding staff. In accordance with IBC Table 503, a Group R-4 occupancy as



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constructed here (Type IIIB), is permitted an allowable area of 16,000-sq.ft. and four stories to a maximum height of 55-ft. Therefore, this building construction and occupancy type lies within the parameters set forth by the IBC.

CODE ANALYSIS

Since this is an existing building undergoing a change of occupancy, provisions in the Fire Code for new occupancies are applied. Chapter 32 of NFPA 101 (LSC) does allow exceptions for conversions, which apply to changes of occupancy from an existing residential or health care occupancy to a residential board and care. Therefore, exceptions for conversions will be taken in this code analysis. The subject townhouse will be provided with sprinkler protection as required by Code. In addition, a Knox box for access may be required by the AHJ.

Since this building has a single exit stair, it is considered a common path of travel, and subject to a maximum travel of 75-ft per NFPA 101:32.3.2.5.2 to the first floor because at this point there are two exits available: the main front entryway and another rear exit through the kitchen area to a back deck. Based on drawings supplied by the building owner, the measured distance of common travel path would be approx. 50-ft, well below maximum allowed by Code. From this point, the travel distance to an exit is 250-ft maximum, a requirement easily met in this small property.

It is our opinion that this building should be permitted to use Chapter 43 Section 10 for historic structures, due to both the age of the building and the beautiful condition of existing architectural features therein (particularly the center staircase). We understand that very limited repairs or renovations will be done to the building as a result of this use change.

Required Separation Between Occupancies

NFPA 101, Table 6.1.14.4.1 requires 1-hour fire resistive construction between this residential board and care occupancy and the adjacent single-family dwellings. Demising walls are constructed by approx. 8-inch brick/masonry construction covered (in almost all cases) by plaster/lathe in good condition. Per NFPA 101:43.10.5.6 (for historic buildings), existing plaster and lathe walls in good condition alone are permitted in lieu of constructing a new one-hour rated partition. In this case, we have brick/masonry plus the plaster/lathe, and therefore we conclude that the demising walls meet, and certainly exceed, the separation requirement (UL and IBC characterize this type of construction as having a minimum 2-hour fire resistance rating).

Means of Escape

The designated path from all areas within the building shall be continuously maintained free of all obstructions or impediments to full instant use in the case of fire or emergency. Because there are sleeping areas above the level of exit discharge, the primary means of escape – in this case the main center stairway – must meet the requirements of NFPA 101: 32.2.2.4, namely:

- A. Shall meet the following dimensional requirements
 - a. Minimum width: 36-in
 - b. Maximum height of riser: 8-in
 - c. Minimum tread depth: 9-in
 - d. Minimum headroom: 6-ft 8-in
 - e. Maximum height between landings: 12-ft
 - f. Landing dimensions: not less than 36-in in any dimension

The existing stairs meet these dimensional requirements without exception.



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- B. There shall be no enclosed spaces (closets, etc.) beneath the main stairs.
The building owner confirms that there are no enclosed spaces beneath the main stairs in this building.
- C. The entire means of escape (including the path from the base of the stairs to the outside of the building), shall be arranged such that the occupants are not required to pass through a portion of a lower story, unless that route is separated by ½-hour rated construction. NFPA 101:32.2.2.4.6 permits the third story to be open as long as the first and second floors are enclosed by ½ hour rated construction, including doors that are a minimum of 20-minute rated and self-closing.

Per this section the current configuration of the center stairway does not meet Life Safety Code, Chapter 32 requirements because of the unprotected openings to the stairwell. The Code will recognize in-tact walls of gypsum board or plaster/lathe construction to be ½-hour rated, but requires there to be doors that will close, in the event of an emergency, to protect the primary means of escape. 20-minute fire rated doors can be provided, with magnetic hold-backs that release upon activation of the building fire alarm (or automatic closers), throughout the path to the exit. Alternately, the AHJ can permit the use of NFPA 101:43.10.5.7.2, which states that *“In buildings of three or fewer stories in height, exit enclosure construction shall limit the spread of smoke by the use of tight-fitting doors and solid elements; however, such elements shall not be required to have a fire rating.”* In other words, the AHJ has the ability to allow existing doors to remain, as long as provisions are made for automatic closure in the event of an emergency.

Due to the configuration of the first floor of the subject property, additional automatic closing doors would need to be added at the entrance to the living room and to the dining room, as shown on the attached floor plans (in red). One additional door may be required for floor two (if provisions for automatically closing the existing pocket door are not applied).

It should also be noted here that transom windows currently exist above many of the interior doors surrounding the main exit. Per NFPA 101:43.10.4.5, existing transoms in residential board and care occupancies are permitted to remain in place as long as they stay closed.

Secondary means of escape from sleeping areas are not required due to the presence of the automatic sprinkler system per 32.2.2.3.3. However, measurements of the windows in all bedrooms and most living areas are properly sized to serve as secondary means of escape, in excess of Code requirements.

Doors

The code applies guidance for doors that result from the need for egress as well as the “care” aspect of this type of occupancy. Access to residents in the event of an emergency is paramount. Per NFPA 101: 32.2.2.5, doors must be not less than 28-in, except bathroom doors, which can be 24-in. wide. Every closet door latch shall be operable from the inside (per 32.2.2.5.3). Every bathroom door shall be able to be opened from the outside, even when locked (per 32.2.2.5.4). Finally, no door in a means of escape can be locked.

All existing doors meet the dimensional requirements of this section. It is the responsibility of the owner to ensure proper operability as previously stated.



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Handrails

According to NFPA 101:7.2.2.4.4.1 (as referenced by Chapter 32), all handrails should be between 30-in and 38-in above the surface of the tread for existing stairs, and the handrail is permitted to be on only one side. In addition, handrails shall be graspable with a circular cross-section with an outer diameter not less than 1 ¼-in and not more than 2-in. Existing handrails are between 34-in and 38-in above the surface of the tread. The handrail does not, however, meet the cross-section requirements of NFPA 101 Chapter 7, as the outer diameter is greater than 2-in. Again, the AHJ is permitted to accept the existing stair handrail where, in their judgment, the existing historic handrail is in fact graspable enough to meet the intent of this section (NFPA 101:43.10.5.7.2).

Protection of Vertical Openings and Hazardous Areas

Where there are vertical openings in the building (such as dumbwaiters, laundry chutes, utility shafts), they must be enclosed by a smoke partition having a minimum ½-hour rating. Other areas in the building containing storage or conditions exceeding those of a one- or two- family dwelling should be protected with smoke partitions and self-closing or automatic closing doors. In this building, there are no dumbwaiters, laundry chutes, or utility shafts, and the boiler room is in the basement of the building, separated via the floor construction, of more than ½-hour fire resistive construction.

Fire Alarm system

A manual fire alarm system is required for this occupancy per NFPA 101:32.2.3.4.1 and per IBC 907.2.10. Actuation of the fire alarm shall be via manual initiation (pull station) and sprinkler system activation. Occupant notification is required and shall be by audible and visual signals (or other means acceptable to the AHJ). Areas not subject to occupancy by persons who are hearing impaired shall not be required to comply with the provisions for visible signals per NFPA 101:9.6.3.5.1; however, it will be difficult to predict that no resident will ever have a hearing impairment and we therefore recommend that visible signals be provided.

The Fire Code does require emergency forces notification (alarm system monitoring), due to the type of sprinkler system required in the following section.

Smoke alarms are required per 9.6.2.10 on all levels including basements, in all living areas, and in all sleeping rooms, and must be powered by the building electrical system, with battery back-up. Interconnection of the smoke detectors will be required; however, smoke alarms will not need to be monitored by the fire alarm system. Smoke alarms are required to be of the photoelectric type.

Carbon monoxide alarms (hard-wired, local, interconnected) are also required on every floor, including the basement, and in the vicinity of all sleeping rooms. It is possible that some smoke and CO detection is existing.

Automatic Sprinkler Detection

The Client is committed to installing an automatic sprinkler system as required by Code. An NFPA 13R system is permitted, with coverage in all habitable areas (including covered porches and balconies) and closets (32.2.3.5.3.2), and supervised by a monitoring agency or the fire department.



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Building Utilities

Unvented fuel-fired heaters are not permitted in any residential board and care occupancy. This is provided for your information as no unvented fuel-fired heaters are currently present or planned.

This concludes our Code analysis at this time, and is based on the information provided to us by the Client. We will continue to be available to assist you with this project, as necessary.

Respectfully submitted on June 8, 2017,

Alison C. Brackett, PE



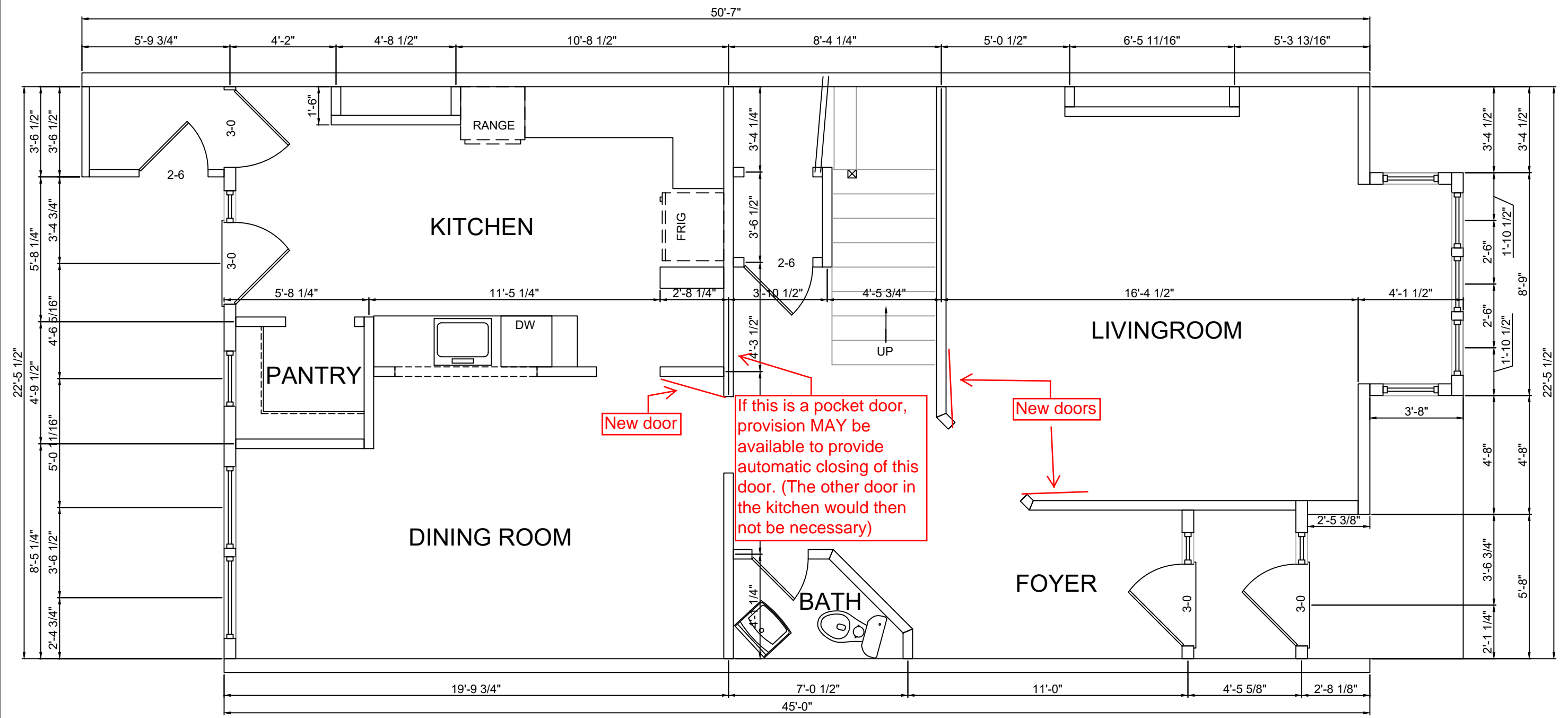
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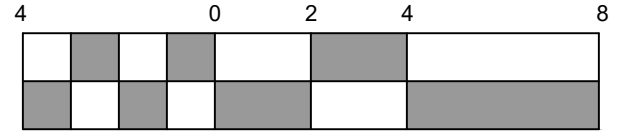
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EXISTING 1st FLOOR PLAN

SCALE: 1/4" = 1'-0"

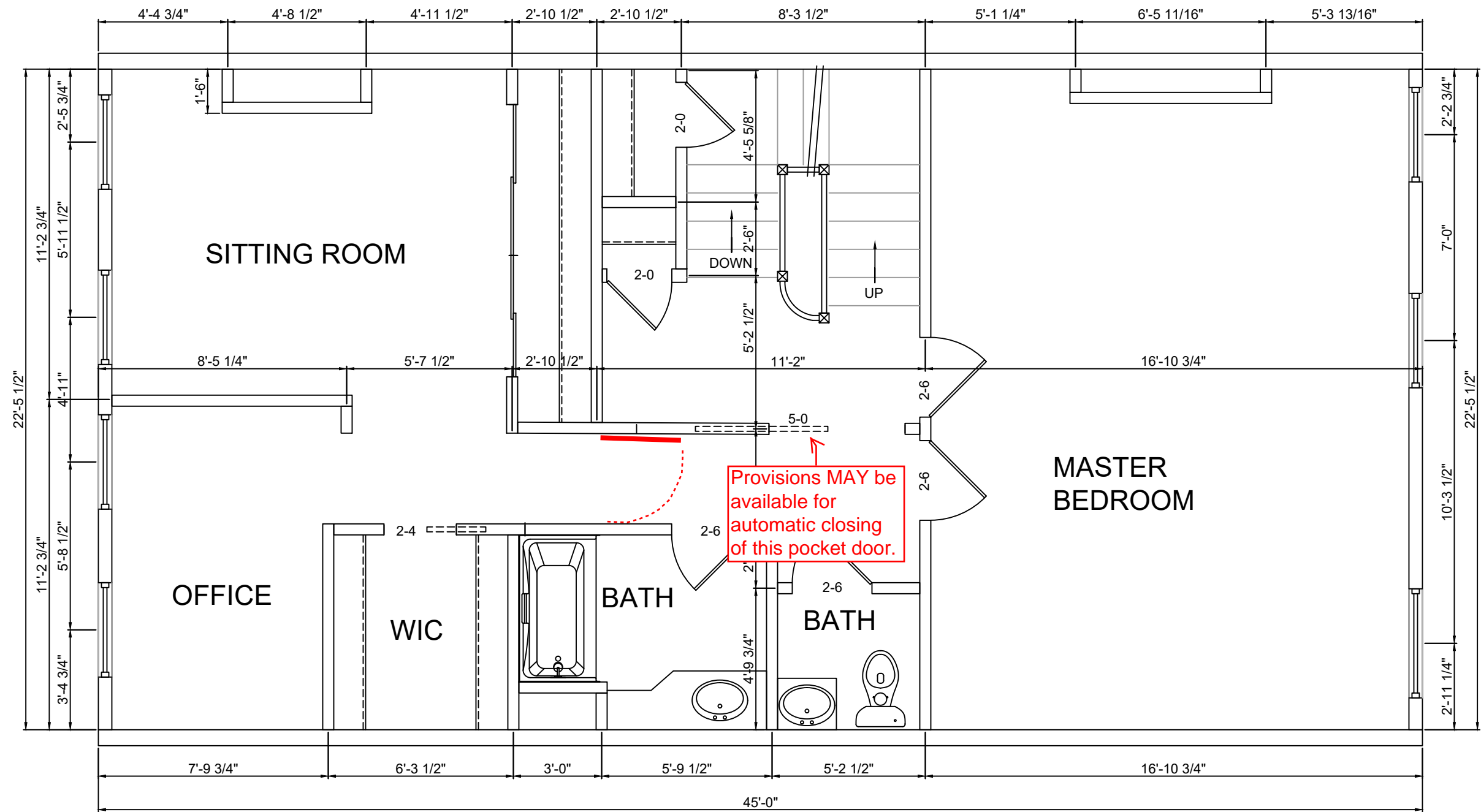
GRAPHIC SCALE



SCALE: 1/4" = 1'-0"

DATE ISSUED 3/28/17

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17 NASON ROAD GORHAM, MAINE 04038 207-632-3111		
JIM GRAY		
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TITLE: EXISTING 1st FLOOR PLAN		
DATE: 3/24/17	DRAWN BY: J.J.L.	DRAWING NUMBER:
SCALE: as noted	PROJ NO: 2017-028	FP-1



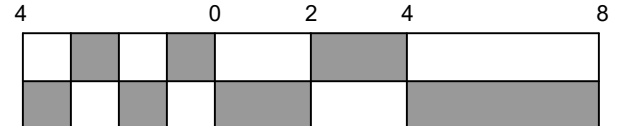
Provisions MAY be available for automatic closing of this pocket door.

EXISTING 2nd FLOOR PLAN

SCALE: 1/4" = 1'-0"

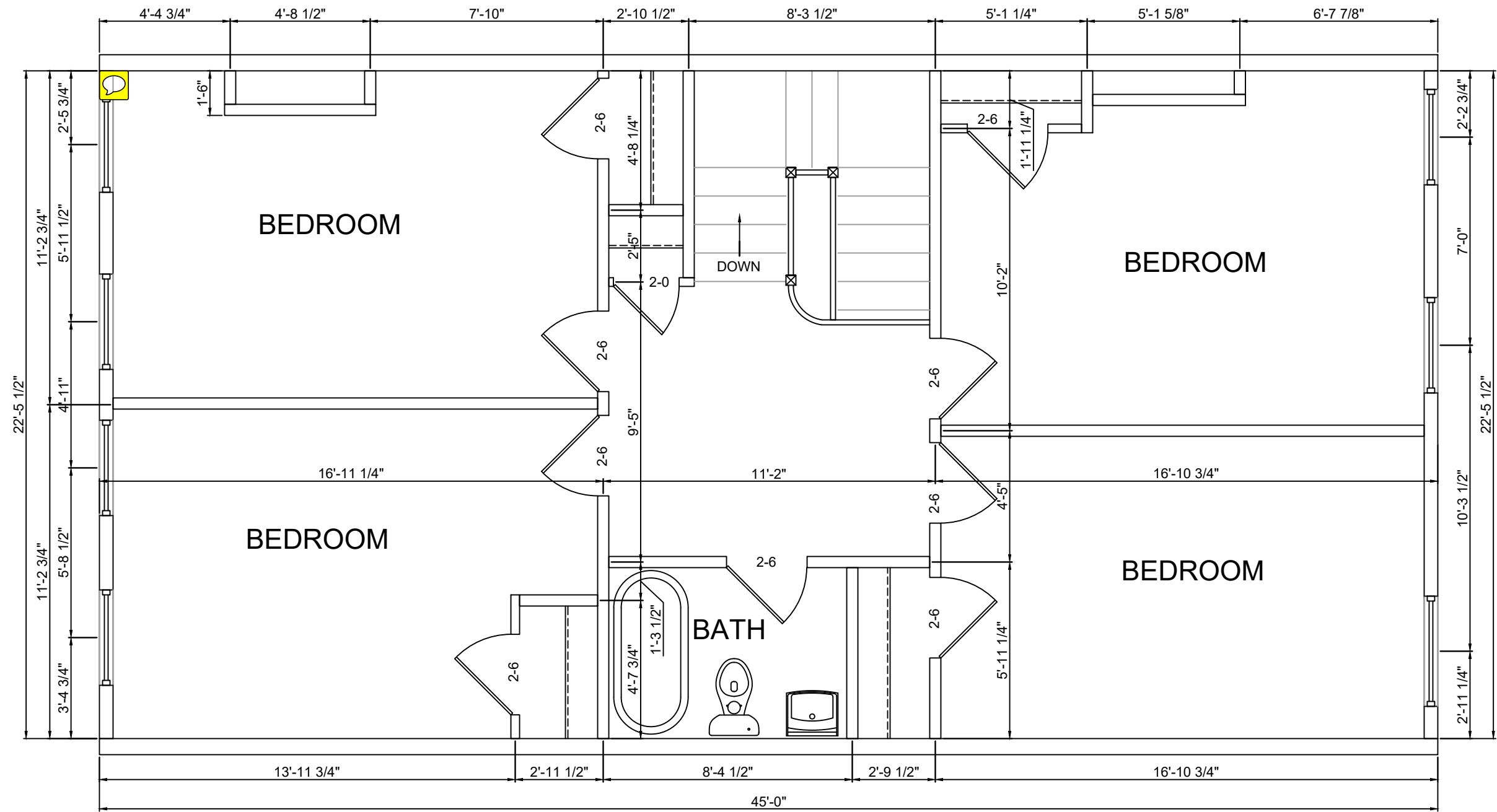
DATE ISSUED 3/28/17

GRAPHIC SCALE



SCALE: 1/4" = 1'-0"

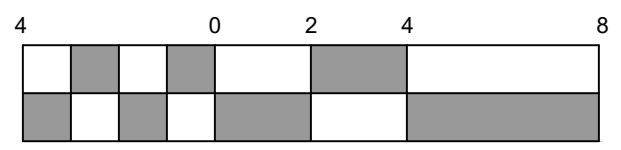
JASON LANDRY CONSULTING, LLC 17 NASON ROAD GORHAM, MAINE 04038 207-632-3111		
JIM GRAY 19 WEST STREET PORTLAND, MAINE		
TITLE: EXISTING 2nd FLOOR PLAN		
DATE: 3/24/17	DRAWN BY: J.JL	DRAWING NUMBER:
SCALE: as noted	PROJ NO: 2017-028	FP-2



EXISTING 3rd FLOOR PLAN

SCALE: 1/4" = 1'-0"

GRAPHIC SCALE



SCALE: 1/4" = 1'-0"

Occupancy Classification
 NFPA: Residential Board and Care (Ch. 32): Small Facility
 IBC: R-4
 Construction Type: IIIB
 Number of stories: Three plus unfinished basement
 Fire Suppression: NFPA 13R system
 Note: Demising Walls between this unit and units on either side are minimum 8-inch masonry with no doors. The equivalent fire rating of this type of wall is at least 2-hours per UL fire resistance directory and IBC. Building is considered fully separated per NFPA 101:Ch. 6.
 Common path of travel: 75-ft
 Max. Travel distance to exit: 250-ft
 Maximum design occupant load: 16 (expected occupancy is 12 max.)

DATE ISSUED 3/28/17

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TITLE: EXISTING 3rd FLOOR PLAN		
DATE: 3/24/17	DRAWN BY: J.JL	DRAWING NUMBER:
SCALE: as noted	PROJ NO: 2017-028	FP-3