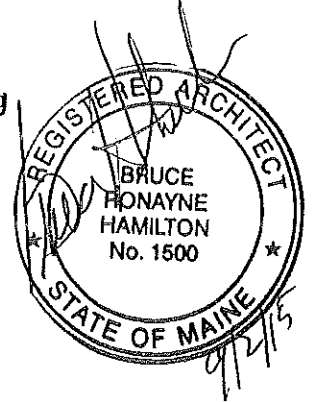




Architecture
Land Planning
Interior Design
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BUILDING CODE STUDY
Alterations for Energy Management Consulting
55 Industrial Way, Portland, ME



Date: September 2, 2015 by Scott J. Vlasak, AIA

Jurisdiction: City of Portland, Maine

Building Location: 55 Industrial Way, Portland, ME

Applicable Codes:

The Maine State Building Code, including, but not limited to the following (with amendments per State of ME dated January 2015):

The International Building Code, 2009 (Code references listed as "IBC" below)

The International Existing Building Code, 2009 (Code references listed as "IEBC" below)

The International Energy Conservation Code, 2009

2010 ADA Standards for accessible design as referenced by title 5, Chapter 337, 4594-G (State of Maine) item "K"

NFPA 1: Fire Prevention Code, 2006 Edition

NFPA 10: Standard for Portable Fire Extinguishers, 2007 Edition

NFPA 101: Life Safety Code, 2009 Edition (Code references listed as "NFPA" below)

Project Description:

Alterations to an existing one-story building.

This project consists of an interior alterations for office areas. There will be no reconfiguration of space in the warehouse area or addition to the building footprint. The renovation will include new partitions, paint, finishes, lighting, furniture & ceiling tiles. The scope also includes upgrading plumbing, electrical, mechanical & a/v equipment associated with some reconfigured spaces. The alterations will also provide a layout that will meet all accessibility requirements. See floor plan sheets A1.0, A1.1 and A1.2 by BRHA and NPCM dated 9/2/15.

Total Floor Areas of Existing Building

First Floor 5,000 s.f.

Renovated Areas of Existing Building (Work Area)

First Floor Offices 2,475 s.f.

Work Area is 49% of the aggregate floor area (2,475 s.f. / 5,000 s.f. = .49)

Use Group Classifications (No change of Use is proposed)

Offices B – Business

Warehouse S-1 – Storage, Moderate Hazard

Type of Construction:

Type 2B - Unprotected, non-combustible construction (per IBC Table 503)
The existing building is a conventional structural steel frame supporting open web steel bar joists with metal decking. The exterior walls are CMU (load-bearing) and the first floor is slab on grade.

Height and Area:

Building Height (The vertical distance from grade plane to the average height of the highest roof surface [IBC 502.1]):

Height Limitations:

Tabular information for Type 2B Construction and S-1 Use: 2-story, 55' from exterior finished grade to the average height of the roof per Table 503 (Note: S-1 Use is the more restrictive Use)

No allowable Increase for Sprinkler

Therefore the total allowable height is 2 stories and 55'

Actual building heights:

Approximately 19' from the average grade plane to the average roof surface.
(Complies)

Area Calculations (per IBC 506)

Formula: $A_a = [A_t + (A_t \times I_f) + (A_t \times I_s)]$

A_a = Allowable Area

A_t = Tabular Building area per story in accordance with Table 503

I_f = Increase for Frontage

I_s = Increase for Automatic Sprinkler System

Frontage Increase: (Per Section 506.2)

Formula: $I_f = [F/P - 0.25]W/30$

I_f = Area increase due to frontage (%)

F = Building perimeter which fronts on a public way or open space not less than 30' width.

P = Perimeter of Building

W = Width of public way or open space (feet)

Project Frontage Calculation:

$P = 300'$

$F = 150'$

$I_f = [150/300 - 0.25]30/30 = .25$ (25%)

Increase for Sprinkler System (I_s) = None

Area Modifications: (per Section 506.0)

For S-1 Use (more restrictive than B Use) of Type 2B construction, the tabular area value is 17,500 s.f.

$$A_a = 17,500 + (17,500 \times .25) + (17,500 \times 0) = 21,875 \text{ s.f.}$$

Actual floor area = 5,000 s.f. **(Complies)**

Mixed Use and Occupancy (per IBC 508.3)

The building will be considered non-separated mixed occupancies (B and S-1). The more restrictive use (S-1) was used for the Area Calculation per 508.3.2.

ALTERATIONS (per IEBC 2009)

Level of Work: Alterations Level 2 per IEBC 2009 for reconfiguration of space not exceeding 50% of the aggregate area of the building (see calculation above)
Level 2 Alterations shall comply with IEBC Chapters 6 & 7

602/701 Building Elements and Materials Any new building elements added as part of the alterations shall comply with Chapter 8 of IBC.

702 No Special Occupancies are existing or proposed in the building

703 Existing Building does not contain any Unprotected vertical openings

603/704 Fire Protection - The existing building is not protected by an automatic sprinkler system or a fire alarm system. The alterations will maintain the current level of fire protection.

604/705 Means of Egress – The work area does not contain exits shared by more than one tenant, and therefore the provisions of IEBC 705.1 do not apply. The alterations will be done in such a way that maintains the level of protection provided for the means of egress.

605/706 Accessibility

The existing accessible entrance shall remain. Alterations shall provide an accessible route to accessible bathrooms and drinking fountain serving the area of primary function on the first floor.

606/707 Structural – No structural modifications are proposed

607/711 Energy Conservation – The exterior walls and roof at altered areas will comply with required insulation values per IECC 2009. (see more information below)

Exterior Walls: The U-value requirement for the entire exterior wall assembly at new office areas is .08 (or R12.5) per IECC 2009 Table 502.1.2. Below is the calculation for the exterior wall assembly which will meet the R12.5 requirement:

<u>R Value</u>	<u>Element</u>
00.17	Exterior Air film
01.11	8" CMU
10.00	2" Rigid foam insulation with z-furring
00.56	5/8" Gypsum
<u>00.68</u>	Interior Air film
12.52 TOTAL	

Water Closets & Lavatories (per 2009 IPC Plumbing Code):
Existing Toilet Rooms & Fixture quantities to remain

Calculations for existing plumbing fixture quantities:
(Note, occupant load calculations are from the section above)

Required for First and Second Floor: 30 people; 15 Male, 15 Female

Use – B (Business)	Water Closets (1/25 up to 50, then 1/50)	Lavatories (1/40 up to 80, then 1/80)	Drinking Fountain	Other
Male	1 WC	1	1 per 100	1 Service Sink
Female	1 WC	1		