IF THIS SHEET IS NOT 24 X 36 IT IS A REDUCED SCALE PRINT - SCALE ACCORDINGLY

Code Review – NFPA 2009

Please note: This code review was performed in conjunction with a preliminary tenant fit-out. Some of the items below may not apply to the Building Shell. See sheet T1.02 for preliminary tenant fit-out layout.

Chapter 6 – Classification of Occupancy and Hazard of Contents

Section 6.1.2.1 – The Simulation classroom and lab, on the first level has an occupant load of 54 people and is thereby defined as Assembly.

Section 6.1.11.1 – Per the commentary, the remainder of this building (except for mechanical and storage areas) is defined as a Business occupancy.

Section 6.1.14.2.3 – Due to the Simulation classroom having an Occupant Load of over 50 people, it is required to be separated by a 1-hour rated assembly per Table 6.1.14.4.1(b).

Chapter 7 – Means of Egress

Section 7.1.3.1 – Corridors used as exit access are required to be 1-hour rated per this section. However, per subsection (2) of this section, they are not required to be rated per Section 38.3.6(3).

Section 7.1.3.2.1 – The two exits that serve this building are required to be 1-hour rated (connecting three stories or less).

Section 7.1.3.2.2 – The exit enclosures provide continuous protected path of travel to an exit discharge.

Section 7.2.1.2.4 – Door openings in the Means of Egress shall be 36" wide (32" min. clear width). Also, per Section 7.3.3 (Table 7.3.3.1), the door components shall provide for 0.2 inches per occupant (345 total load / 173 per floor / 87 per exit door): 87 people x .2" = 17.4" (use 32" clear min.).

Note: Door hardware will adhere to all code requirements and is described in the specifications.

Section 7.2.2.2.1.2(B) – Due to the occupant loads being greater than 50, the minimum stair widths are 44" per Table 7.2.2.2.1.2(B) for occupant loads less than 2,000 people.

Note: Maximum risers shall be 7", minimum tread depths are 11", and there will be less than 12'-0" between landings (per Table 7.2.2.2.1.1(a)).

Section 7.2.2.2.3.2.4 – Landings shall be 48" wide (in the direction of travel).
Section 7.2.2.4.1.1 – Handrails will be provided on both sides of the stairs and conform to Section 7.2.2.4.4.

Section 7.2.2.4.5.2 – Guards shall be 42" high and conform to Section 7.2.2.4.5.3.

Section 7.2.2.5.1.1 – Stairs shall be enclosed as required (also see Section 7.1.3.2).

Section 7.2.2.5.2.2 – Construction of the stair enclosures shall extend to the roof line.

Section 7.2.2.5.4.2 – Signage for the lower level, showing the direction to the level of exit discharge will comply with this section.

Section 7.2.5 – Exterior ramps shall comply with all dimensional requirements of this section.

Section 7.2.12.2 – An area of refuge is provided in one of the stairwells (also see Section 7.5.4.4).

Section 7.2.13 – This section does not apply since the elevators in this building are not considered means of egress.

Section 7.3.1.2 – The occupant load is as follows (per Table 7.3.1.2):

Basement Level: 2,423 s.f. / 500 s.f. per person = 5 persons
First Level:
- Business Use: 11,965 s.f. / 100 s.f. per person = 120 persons
- Utility/Storage Use: 1,463 s.f. / 500 s.f. per person = 3 persons
- Assembly Use: 2,431 s.f. (designed for 54 persons) = 54 persons

Second Level:
- Business Use: 15,679 s.f. / 100 s.f. per person = 157 persons
- Utility/Storage Use: 160 s.f. / 500 s.f. per person = 1 person

Total Occupant Load: 340 persons

Section 7.3.3.1 – The egress capacity shall be .3" per occupant for the stairs. Each stair to serve a maximum of 79 persons (158 total occupant load on the second floor, divided by 2). Therefore, 79 persons x .3" per person = 23.7" (use minimum width of 44" per Section 7.2.2.2.1.2(B)).

Section 7.4.1.1 – There are two means of egress provided from the first level and second level (2 means of egress are required).
Section 7.4.1.1(1) – There is a single exit out of the basement level per 38.2.4.3.

Section 7.5.1.3.3 – The diagonal distance of the building is 205'. Because the building is sprinkled, the minimum distance between exits shall be 68'-4". The actual distance between exits is 159'-0" on the First Level and 161'-4" on the Second Level.

Section 7.5.4.1.1 – Only one accessible means of egress from the second floor is provided. This exit stairwell is accessible from all areas of the second floor within the allowable travel distance per Section 38.2.6.1 (300').

Section 7.5.4.4 – The exit stair that is used as an accessible means of egress is provided with an area of refuge, and is compliant with Section 7.2.12.3.

Section 7.7.1 – Both stairwells terminate directly to the exterior.
Note: Per Section 7.7.2, the discharge from the second floor is permitted to go through areas on the first floor (50% of occupants and 50% of exits). Exit is through an open lobby space and the building is sprinkled (Sections 7.7.2.3 and 7.7.2.4).

Section 7.12.1(1)(a) – The common path of travel out of the Mechanical basement is be less than 100' (actual distance, including within the exit, is 98'-5").

Section 7.12.2 – The Mechanical basement is allowed to have one exit.

Chapter 8 – Features of Fire Protection

Section 8.3.4 – Opening protectives in fire resistant rated assemblies shall comply with Section 8.3.4.2.

Section 8.5 – The smoke barriers that enclose the Communicating Space (see Section 8.6.6) shall comply with this section.

Section 8.6.5(2) – The fire resistant rating of floor opening enclosures (shafts) shall be 1-hour as they are connecting less than four stories.

Section 8.6.6 – At the North entrance to the building, a Communicating Space is located. This space is not prohibited by Chapter 38 of this code, and will be compliant with this Section.
(1) The communicating space connects two stories.
(2) The lowest floor area of the connecting space is a street floor (and the level of exit discharge).
(3) The floor area is open and unobstructed.
(4) Per subsection (a), the building is sprinkled and therefore the communicating space is required to be separated by smoke barriers (not 1-hour rated walls).
(5) The hazards within the space are ordinary hazards.
(6) The occupant load of the entire communicating floor area is: 2,167 sf on the 1st floor + 1,539 sf on the 2nd floor = 3706 sf / 100 sf per person (Business) = 38 persons. All of the 38 occupants can exit out of the stair at once as the stair has the required egress capacity. Persons on the second floor communicating space can egress by entering the stair and then going directly outside. Persons on the first floor communicating space can egress through the front door, or if they have to, into the stair and directly out.
(7) Each occupant of the communicating space has access to the exit without having to go back through the communicating space (see note 6 above).
(8) Each occupant not in the communicating space has access to an exit without entering the communicating space. All of the occupants not in the communicating space have access to the other exit. From the furthest point (not in the communicating space) to that exit is 185' (the maximum travel distance to an exit is 300' per Section 38.2.6.1).

Section 8.6.10.1 – Draftstopping of concealed spaces are as follows:
(1) Walls and partitions at each floor level, top floor ceiling level, and level of roof support.
(2) The unoccupied space formed by the sloped roof at 3,000 s.f. (maximum).
(3) Concealed spaces between the ceiling and the floor above at 1,000 s.f. maximum, and the concealed space between the second floor ceiling and roof at 3,000 s.f. maximum.

Chapter 9 – Building Service and Fire Protection Equipment

Section 9.4 – The elevators shall comply with this section and the requirements of ASME A17.1.

Section 9.4.5 – The elevators do not have travel distances that exceed 50' above the level of exit discharge or 30' below the level of exit discharge. Therefore, the independent ventilation requirements for the machine rooms are not required (per this code, also see Mechanical).

Section 9.6 – The Fire Detection and alarm systems shall be installed in this building and comply with this section.

Section 9.7 – The automatic sprinkler system shall be installed in this building and comply with this section.

Section 9.7.4 – It is anticipated that three fire extinguishers will be installed on each floor of the building. All fire extinguishers shall comply with this section of the code and with NFPA 10.

Chapter 10 – Interior Finish, Contents and Furnishings

Section 10.2.8 – Automatic sprinklers will be installed in this building. Class A, B, and C finishes will be installed accordingly and comply with this section of the code.

Chapter 38 – New Business Occupancies

Section 38.2.3.2 – The clear width of all corridors and passageways serving occupant loads over 50 persons shall be greater than 44" in width.

Section 38.2.4.3 – A single exit will be provided out of the basement level.

Section 38.2.5.2.1 – Dead-end corridors shall not exceed 50' (building is sprinkled).

Section 38.2.5.3.1 – Common path of travel shall not exceed 100' (building is sprinkled).

Section 38.2.6.1 – The travel distance to an exit shall not exceed 300' (building is sprinkled).

Section 38.2.9.1 – Emergency lighting shall be provided (building has more than 50 occupants above the level of discharge).

Section 38.3.1.1 – Vertical openings (except for the Communicating Space per Section 8.6.6) shall be protected as required by Section 8.6.

Section 38.3.1.2 – The basement floor area does not have unprotected openings to the floor above.

Section 38.3.4.1(2) – This building will have more than 50 occupants above the level of exit discharge and will be required to install a fire alarm system that is compliant with this code.

Section 38.3.5 – Fire extinguishers shall be installed (also see Section 9.7.4).

Section 38.3.6.1(3) – This building is fully sprinkled and is not required to have fire-rated corridors.

Section 38.7.1 – This building will have an occupant load greater than 100 above the level of exit discharge and will be required to have scheduled fire drills in accordance with Section 4.7 of this code.

Section 38.7.2 – Fire extinguishers will be installed in this building and periodic training for designated employees is required.

Code Review – IBC 2009

Please note: This code review was performed in conjunction with a preliminary tenant fit-out. Some of the items may not apply to the Building Shell. See sheet T1.02 for preliminary tenant fit-out layout.

Chapter 3 – Use and Occupancy Classification

Section 303.1 – The Simulation space on the first level has an occupant load of 54 and is classified as Assembly (A-3).

Section 301.1 – The main classification of this University building to be Business (B).

Chapter 4 – Special Detailed Requirements Based on Use and Occupancy

Section 404.1.1 – The opening between floors located in the northeast corner of the building is defined as an "atrium", and connects two floors.

Section 404.3 – An automatic sprinkler system shall be installed throughout the building.

Section 404.4 – A fire alarm system shall be installed (not required per 907.2.14 due to the atrium connecting two stories only – however, it is required by NFPA).

Section 404.5 – A smoke control system is not required due to the atrium connecting two stories only.

Section 404.6 (B) – The atrium space is not required to be separated as a maximum of three stories are allowed to be connected to the atrium space (building has two stories connected). Note: A smoke control system is not required per 404.5.

Section 404.8 – Interior finishes of the atrium space shall not be less than Class B.

Section 404.9 – The travel distance to an exit within the atrium space shall not exceed 200 feet.

Chapter 5 – General Building Heights and Areas

Table 503 – Per this table (assuming Type 5B construction), this building is allowed 40' in height, and two stories of 9,000 square feet each.

Section 504.2 – Due to the automatic sprinkler, this building can be increased to 60' in height and three stores.
Section 506.1 – Per the area increases outlined in Section 506.2 and 506.3, this building is allowed stories of 30,870 square feet each.

A = 9,000 + (9,000 x (387.75/567 - .25 x 1)) + (9,000 x 2)
A = 30,870 square feet
Section 506.4.1 – Total building area to be 61,740 square feet maximum (actual area = 35,973 square feet).

Section 508.1 – The Simulation classroom on the first floor exceeds 50 persons and is classified as Assembly. Therefore, the building is evaluated as Mixed Use. Also refer to Section 508.2.1 and 508.4.

Section 508.2.1 – The Simulation classroom on the first floor cannot be considered an accessory occupancy. The first floor has an area of 17,047 s.f. and the Simulation classroom has an area of 3,121 s.f., which is greater than the 10% allowed. Therefore, the space is required to be separated per Table 508.4.

Table 508.4 – The Assembly area (Simulation classroom) located on the first floor is required to be separated from the remainder of the building with a 1-hour rated assembly (sprinkled building).

Chapter 6 – Types of Construction

Table 601 – For purposes of determining area, and height limitations, it is assumed this building will be Type 5 (B) construction.

Table 602 – The fire separation distance of all exterior walls is greater than 10 feet. Therefore, there is no fire resistance rating required in this Table.

Chapter 7 – Fire and Smoke Protection Features

Table 705.8 – The minimum fire separation distance is 20 feet (west side). Therefore, there is no limit to the amount of wall openings (unprotected, sprinkled).

Section 705.8.2 – The second floor windows on the west side are required to be protected openings (per 705.8.6). Per the exception in this section, the building will be fully sprinkled and the exterior openings shall be protected with water curtains by the sprinkler system.

Section 705.8.6 – The second floor window openings on the west side are within 15' vertically of the adjacent building and are required to be protected (see section 705.8.2).

Section 705.8.5 – Openings in exterior walls shall be separated by 36" minimum between floors (Figure 705.8.5(1)).
Section 705.11 (1) – A parapet is not required on the exterior walls due to the absence of a required fire rating (see Table 602).

Section 708.4 – Shaft enclosures shall have a fire-resistance rating of not less than 1-hour (connecting less than 4 stories).

Section 708.14.1 – Enclosed elevator lobbies are not required as the elevators do not connect more than 3 stories.

Section 709.1(4) – Corridor walls are not required to be separated (see Section 1018.1).

Section 711.1 – Smoke partitions are not required by this code. However, they are required for the "communicating space" as described in the NFPA 2009 code. Refer to the Code Review for the NFPA 2009 code.

Section 717.4.3 – Draftstopping shall be installed in the sloped roof areas to limit square footage to 3,000 square feet. (Note: A sprinkler system may be installed in the attic areas to eliminate the draftstopping.

Chapter 9 – Fire Protection Systems

Section 903 – A sprinkler system is not required by Table 903.2. However, a sprinkler system will be installed in this building and comply with all the provisions of this chapter in the code.

Section 906 – Portable fire extinguishers shall be installed on each floor of this building. Refer to the Egress plans for exact locations. Refer to the specifications for type and size of extinguishers.

Section 907 – A Fire Alarm System is required by Table 907.2 (Business occupancy with more than 100 occupants on the second level), and will comply with all the provisions of this chapter in the code.

Chapter 10 – Means of Egress

Section 1003.2 – The ceiling height in the Means of Egress shall not be less than 7'-6" (except for the allowable projections in Section 1003.3.1).

Section 1003.3.1 – The stair located at the southwest corner of the building protrudes below the ceiling height. A barrier shall be provided as shown in Figure 1003.3.1(2) to maintain headroom at 80".
Section 1004 – The Occupant Load (per Table 1004.1.1 and section 1004.7) is as follows:

Mechanical Space (Basement): 2,412 s.f. / 300 s.f. = 9 persons

Simulation Classroom (1st floor): 54 persons (actual number of stations and instructors)
Business area (1st floor): 13,103 s.f. / 100 s.f. = 132 persons

Business area (2nd floor): 16,253 s.f. / 100 s.f. = 163 persons

Total Occupant Load = 304 persons

Section 1004.3 – The Simulation classroom shall have the occupant load posted as required.

Section 1004.5 – Egress convergence occurs at the north exit (basement access). The exit is sized to accommodate the added occupant load.

Section 1004.7 – The Simulation classroom is defined as an Assembly occupancy (54 persons) based on the actual number of stations and instructors.

Section 1005.1 – The minimum width of the stairways from the second floor:

163 persons x .3 inches = 48.9 inches
48.9 inches / 2 = 24.45 inches

(Note: Per Section 1009.1, the minimum width is 44 inches)

The minimum width of the stairway out of the basement:

9 persons x .3 inches = 2.7 inches

(Note: Per Section 1009.1, the minimum with is 36 inches)

Section 1007.1 – Two exits are required by Section 1015.1 and 1021.1, therefore two Accessible Means of Egress are required.

Section 1007.2.1 – Since this building is under four stories, an elevator is not required to be an Accessible Means of Egress.

Section 1007.3(2) and (3) – The 48" width of the stairway is not required due to the sprinkler system. The area of refuge is not required due to the sprinkler system.

Section 1007.8 – Two-way communication systems shall be provided at the elevator landings on the second floor.

Section 1008.1.1 – All doors within the means of egress shall be 36" doors with a clear width of 32" minimum.
Section 1008.1.6 – Landings (or floors) on each side of the doors shall have a minimum length of 44" and a width at least as wide as the stairway.

Section 1008.1.7 – All thresholds shall be ADA compliant.

Section 1008.1.8 – The space between the doors in the airlock at the northeast entrance shall be 7'-0" (48" + 36" door width).

Section 1008.1.9.1 – All door hardware shall be compliant with this section.

Section 1009.1 – The stairways from the second floor shall be 44" wide. The stairway from the basement floor shall be 36" (exception #1).

Section 1009.2 – The headroom at all stairways shall be 80" minimum (see also Section 1003.3.1).

Section 1009.4.2 – All stairs shall have a maximum stair riser of 7" and a minimum tread depth of 11".

Section 1009.4.4 – The stair risers and treads shall not exceed 3/8" in uniformity.

Section 1009.7 – The vertical rise between landings does not exceed 12'-0".

Section 1009.12 – Stairways shall have handrails on both sides of the stair.

Section 1009.13 – Since this building does not exceed 3 stories in height, a stairway to the roof is not required (a fixed roof access ladder is provided).

Section 1009.13.2 – The roof hatch is not located within 10 feet of any roof edge.

Section 1009.14 – The elevator equipment is located on the basement level and on the first floor. The roof does not contain any elevator equipment.

Section 1010.2 – Exterior ramps shall not exceed 1:12 slope in the direction of travel.

Section 1010.4 – Exterior ramps shall not exceed 30" in vertical rise between landings.

Section 1010.5.1 – There are no Means of Egress ramps. The width between handrails shall be 36".

Section 1010.6.3 – The exterior ramps are part of the accessible route and shall have landing lengths of 60".

Section 1010.8 – Exterior ramps shall have handrails on both sides of the ramp.

Section 1010.10 – Guardrails shall be provided as required (also see Section 1013).
Section 1011.1 – Exit sign locations are shown on the Electrical plans (also refer to the Specifications).

Section 1012.1 – Handrails shall be installed on both sides of the stairways and exterior ramps.

Section 1012.2 – The handrail height (as measured by this section) shall be 34".

Section 1013.1 – Guards shall be installed at the stairways and exterior ramps that are more than 30" above the adjacent grade or floor. In addition, there are 42" high guards around the floor opening located at the northeast corner of the building (Communicating space per NFPA / Atrium space per IBC). The exterior loading dock is not required to have a guard as the change in elevation is less than 30".

Section 1013.1.1 – The glass guardrails shall comply with this section and section 2407.

Section 1013.2 – Guards shall be 42" high.

Section 1013.3 – The opening limitations in the guards shall comply with this section.

Section 1014.2 – One of the Means of Egress out of the Simulation classroom is through an intervening space. However, per Exception #1, the adjoining space is accessory to the main space.

Section 1014.2.4.3 – On the first floor, there is a suite (no patient sleeping rooms) of rooms, and the travel distance does not exceed 100' (actual travel distance = 85'-10" feet).

Section 1014.3(1) – The Common Path of Travel shall not exceed 100' (building is sprinkled).

Section 1015.1 – Two exits are required out of the building. In addition, per Table 1015.1, two exits are required out of the Simulation classroom on the first floor (Occupant load is 54 persons in the Simulation classroom).

Section 1015.1.1 – Three exits are not required as the Occupant Load for the building does not exceed 500 persons.

Section 1015.2.1(2) – The overall diagonal of the building is 205'. The exits are required to be a minimum of 1/3 of the overall diagonal distance apart (68'-4"). See Egress Plan for location of exits.

Section 1016.1 – Per Table 1016.1, the Exit Access Travel Distance shall not exceed 300' for the Business areas (building is sprinkled) and 250' for the Assembly area on the first floor (Simulation classroom).

Section 1017.2 – Aisle widths shall be 36" minimum.

Section 1018.1 – Per Table 1018.1, due to the sprinkler system in the building, the corridors are not required to be fire rated.
Section 1018.2 – The minimum corridor width shall be 44".

Section 1018.4(2) – Dead end corridors shall not exceed 50'.

Section 1021.1 – Per Table 1021.1, the Occupant Load for the building does not exceed 500 persons per floor and is therefore required to have two exits from each floor.

Section 1021.2 – Per Table 1021.2, the Basement level is allowed to have one exit (less than 49 occupants and a travel distance less than 100').

Section 1022.1 – Both interior exit stairways are separated with a fire-resistance rating of 1-hour

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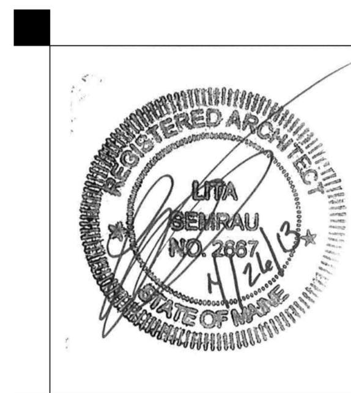

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REVISIONS

No.	Description	Date
4	Add Alternate #1	2/08/13
3	First Floor Redesign	1/09/13
2	Addendum #9	8/16/12
1	Addendum #8	7/30/12

PERMIT DOCUMENTS

UNIVERSITY OF NEW ENGLAND
PORTLAND, MAINE

PATIENT CARE CENTER
COMP CARE FIT-OUT

Project Number	12533.00
Date	April 26, 2013
Drawn by	JAP/JTC/SB
Checked by	LAS

T1.01

Scale: As indicated