



Project Scope and Narrative: Brewery & Restaurant

April 20, 2017

Submitted to:

John Doe
John Doe Architecture
Street Address
Town, State Zip

Job Location:

Brewery & Restaurant
Street Address
Town, NH Zip

Dear Mr. Doe,

Nortech Systems (Nortech) is providing code consulting services to John Doe Architecture, with respect to fire and life safety, for the alteration and expansion of a restaurant in New Hampshire. The building will be modified to include a brewery. It will be altered to comply with applicable portions of the New Hampshire State Building Code (RSA 155-A). Specifically, the International Existing Building Code (IEBC-2009). The building will also be modified to comply with the New Hampshire State Fire Code (Saf-C 6000). Including, but not limited to, the Fire Code (NFPA 1-2009) and the Life Safety Code (NFPA 101-2015).

1 Construction Type

- 1.1 The exterior walls will utilize combustible or limited combustible materials. Therefore, the building is of Type V (Five) construction. The interior walls, as well as the ceiling/roof assembly, will not be rated. Thus, the National Fire Protection Association (NFPA) further classifies the construction as Type V (000). This is known as Type 5B by the International Code Council (ICC).

2 Level of Exit Discharge (LED)

- 2.1 The level of exit discharge is defined in Section 3.3.85.1 of NFPA 101-2015. It is the lowest story from which not less than 50 percent of the required number of exits and not less than 50 percent of the required egress capacity from such a story discharges directly outside to the finished ground level. Thus, the building's main level is deemed to be the level of exit discharge. The NFPA counts stories from the level of exit discharge. Thus, per NFPA, the building will be one story tall with a basement.
 - 2.1.1 Per Section 8.6.10.2.1 in NFPA 101-2015, the equipment loft will be considered an open mezzanine. Because its area will be limited to one-third the open area of the room in which it's located, it will be exempt from being counted as a story.
 - 2.1.2 Per Section 8.6.10.2.1 in NFPA 101-2015, the storage loft will be considered an open mezzanine. Because its area will be limited to one-third the open area of the room in which it's located, it will be exempt from being counted as a story.

3 Story Above Grade Plane

- 3.1 A story above grade plane is any story having its finished floor surface entirely above grade plane, or in which the finished surface of the next floor is: more than 6 feet above grade plane, or more than 12 feet above the finished ground level at any point. The ICC counts stories starting with the story above grade plane and ending with the highest occupiable story containing the occupancy considered. Thus, per ICC, the building will be one story tall with a basement.
- 3.1.1 Per Section 505 in the International Building Code (IBC-2009), the equipment loft will be considered an open mezzanine. Because its area will be limited to one-third the open area of the room in which it's located, it will be exempt from being counted as a story.
- 3.1.2 Per Section 505 in IBC-2009, the storage loft will be considered an open mezzanine. Because its area will be limited to one-third the open area of the room in which it's located, it will be exempt from being counted as a story.

4 Use and Occupancy

- 4.1 NFPA 101-2015 considers the brewery to be a mix of Assembly, Industrial, and Storage Occupancies, with incidental Business and Mercantile Occupancies. Within IBC-2009, the Assembly Occupancy is classified as an Assembly (A-2) Use Group, the Industrial Occupancy is classified as a Factory (F-1) Use Group, the Storage Occupancy is classified as a Storage (S-1) Use Group, the Business Occupancy is classified as a Business (B) Use Group, and the Mercantile Occupancy is classified as a Mercantile (M) Use Group.

5 Work Area

- 5.1 The building's work area will consume more than 50 percent of its aggregate floor area. This is considered a Level 3 alteration in IEBC-2009 and a modification in NFPA 101-2015. The Level 3 alteration will comply with the provisions of IEBC-2009 Chapter 6, 7 and 8 for Level 1, 2 and 3 alterations, respectively. Unless otherwise noted in IEBC-2009, new work within the alteration will comply with the requirements of IBC-2009, the International Energy Conservation Code (IECC-2009), the International Mechanical Code (IMC-2009) and the International Plumbing Code (IPC-2009) for new construction. With respect to NFPA 101-2015, newly constructed elements, components, and systems will comply with the requirements of the Code applicable to new construction. The remainder of the building will meet the requirements of the Code applicable to the building's existing occupancy chapters.
- 5.1.1 Per Section 705.2, Exception 1, in IEBC-2009, the means of egress will comply with IEBC-2009, unless it complies with NFPA 101-2015.
- 5.2 The building's aggregate floor area will be increased. The addition will comply with Chapter 10 in IEBC-2009. With respect to NFPA 101-2015, the addition will comply with the requirements of the Code applicable to new construction. The remainder of the building will meet the requirements of the Code applicable to the building's existing occupancy chapters.

6 Building Height and Area

- 6.1 Per Section 1002 in IEBC-2009, no addition shall increase the height of an existing building beyond that permitted under the applicable provisions of Chapter 5 of IBC-2009. The building will not exceed the maximum heights and area, as catalogued in Table 6.1.

Table 6.1: Allowable Building Heights and Area (For Type VB Construction)

Most Restrictive Use Group	Allowable Height (Stories)	Allowable Height (Feet)	Allowable Area (Square Feet)
Assembly (A-2)	2 ¹	60 ²	24,000 ³

¹ Includes one-story automatic sprinkler increase.

² Includes 20-foot automatic sprinkler increase.

³ Includes 300% automatic sprinkler increase.

7 Means of Egress

- 7.1 Per Section 42.2.4.1(2) in NFPA 101-2015, the basement will be served by a single means of egress. This is allowed as its common path of travel is less than 100 feet (the allowable common path distance for sprinklered Storage Occupancies).
- 7.2 Per Section 40.2.4.1.2 in NFPA 101-2015, the exterior mechanical space will be served by a single means of egress. This is allowed as its common path of travel is less than 100 feet (the allowable common path distance for sprinklered Industrial Occupancies).
- 7.3 Per Section 38.2.4.3 in NFPA 101-2015, the office space (located behind the bar) will be served by a single means of egress. This is allowed as the space will comply with the following criteria.
- 7.3.1 It will have an occupant load fewer than 100 people.
 - 7.3.2 It will exit directly to an exterior area at ground level.
 - 7.3.3 Its total travel distance will not exceed 100 feet.
 - 7.3.4 It will not use stairs more than 15 feet in height.
- 7.4 Per Section 7.4.1.1 in NFPA 101-2015, the equipment and storage lofts will each be served by a single means of egress. This is allowed as their common paths of travel are less than 100 feet (the allowable common path distance for sprinklered Industrial Occupancies).
- 7.5 The equipment loft will be considered a building service equipment support area in which people are not expected to be present on a regular basis.
- 7.5.1 Per Section 7.13.2.1 in NFPA 101-2015, egress from this space will be by hardware not complying with the door requirements of Section 7.2.1 in NFPA 101-2015.
 - 7.5.1.1 Per Section 7.2.9.1 in NFPA 101-2015, the loft will use a fire escape ladder. This is allowed as the mezzanine's occupant load will not exceed three people. The three-person occupant load will be posted on a readily visible sign, located adjacent to the fire escape ladder.
 - 7.5.1.2 Per Section 7.2.9.2.2 in NFPA 101-2015, the ladder will be installed with a pitch that exceeds 75 degrees.
 - 7.5.2 Per Section 7.13.1.2 in NFPA 101-2015, the building service equipment support area will not contain fuel-fired equipment or be used for the storage of combustibles.
 - 7.5.2.1 If the loft must contain fuel-fired equipment or contain combustible storage, it will be equipped with a stair that complies with Section 7.2.2 in NFPA 101-2015.

- 7.6 Aisles and aisle accessways will comply with seating requirements for seating at tables.
 - 7.6.1 Per Section 12.2.5.8 in NFPA 101-2015, aisles will have a minimum clear width of 44 inches where serving an occupant load exceeding 50, and 36 inches where serving an occupant load of 50 or fewer. These widths do not include the space required for seats (19" from table to back of seat).
 - 7.6.2 Each aisle accessway will have a minimum clear width per Section 12.2.5.7.4 in NFPA 101-2015. Excluding the space required for seats, the minimum clear width of aisle accessways will be as follows:
 - 7.6.2.1 Zero inches for the first 6 feet of length toward the exit, if not used by more than 4 persons.
 - 7.6.2.2 12 inches for the next 6 feet; that is, up to 12 feet of length.
 - 7.6.2.3 12 inches to 24 inches for lengths of 12 feet to 36 feet, the maximum length to the closest aisle or egress doorway permitted by Section 12.2.5.7.5. The minimum clear width of an aisle accessway shall be increased beyond the 12-inch requirement by a half inch for each additional foot or fraction thereof beyond 12 feet of aisle accessway length, where measured from the center of the seat farthest from an aisle.
- 7.7 The basement will have a maximum occupant load of 4 people. It will be equipped with an exit stair having a minimum egress capacity of 120 people. This exceeds the demand set forth by the occupant load.
- 7.8 The exterior mechanical space will have a maximum occupant load of 8 people. It will be equipped with an exterior exit having a minimum egress capacity of 165 people. This exceeds the demand set forth by the occupant load.
- 7.9 Including mezzanines, but excluding the exterior mechanical space, the first floor will have a maximum occupant load of 484 people. It will be equipped with eight exterior exits, each having a minimum egress capacity of 165 people. This exceeds the demand set forth by the occupant load.
 - 7.9.1 Per Section 12.2.3.8 in NFPA 101-2015, the width of any exit access corridor serving 50 or more persons will be at least 44 inches. Per Section 7.3.4, all other corridors will have a minimum clear width of 36 inches.
 - 7.9.2 Per Section 7.2.1.2.3 in NFPA 101-2015, doors will have a minimum clear width of 32 inches.
 - 7.9.3 Exits will be remotely located from each other, unless a single means of egress can serve a space.
 - 7.9.4 Means of egress will not pass through kitchens, storage rooms, closets or spaces used for similar purposes.
- 7.10 Per Section 12.2.2.2.3 in NFPA 101-2015, egress doors in assembly spaces with 100 or more occupants will be will be equipped with panic hardware.
 - 7.10.1 All other exterior doors will be equipped with key-operated locking devices from the egress side. This is permitted in accordance with Section 7.2.1.5.5 in NFPA 101-2015.
 - 7.10.1.1 The locking devices will be readily distinguishable as locked.
 - 7.10.1.2 Readily visible signs will be posted on the egress side of the door, stating: THIS DOOR TO REMAIN UNLOCKED WHEN BUILDING IS OCCUPIED. The signs will be in letters one inch high on a contrasting background.
 - 7.10.1.3 Bolt locks will not be used.
 - 7.10.1.4 Delayed egress locks will not be used.
- 7.11 Stairs will comply with Section 7.2.2 in NFPA 101-2015.
- 7.12 Ramps will comply with Section 7.2.5 in NFPA 101-2015.

- 7.13 Guards will comply with Section 7.2.2.4 in NFPA 101-2015. Guards will be provided at the open sides of means of egress that exceed 30 inches above the floor or finished ground level below.
- 7.14 NFPA 101-2015 regulates common paths of travel, dead-end corridors, and travel distances until one reaches an exit. The layout will not exceed the maximum paths of travel, as catalogued in Table 7.14.

Table 7.14: Maximum Paths of Travel in Sprinklered Buildings

Use of Space	Common Path	Dead-End	Travel Distance
Assembly	20'/75' ¹	20'	250'
Business	100'	50'	300'
General Industrial	100'	50'	250'
Mercantile	100'	50'	250'
Storage	100'	100'	400'

¹ For common path serving > 50 persons, 20 feet; for common path serving ≤ 50 persons, 75 feet.

8 Fire Alarm and Detection

- 8.1 Per Section 13.3.4.1 in NFPA 101-2015, the building will be equipped with a fire alarm system. The system will comply with applicable codes, including the National Fire Alarm and Signaling Code (NFPA 72-2013).
 - 8.1.1 The system will include initiation by manual pull stations, sprinkler monitoring, and automatic smoke detection.
 - 8.1.2 Occupant notification will include audio and visual signals from speakers and strobes.
 - 8.1.2.1 Audible notification will be heard throughout the building. Acoustically distinguishable spaces (ADS) will be determined by the engineer/designer of record.
 - 8.1.2.2 Visual notification will be in all public spaces.
 - 8.1.3 Secondary power will have sufficient capacity to operate the fire alarm system under quiescent load for a minimum of 60 hours and, at the end of that period, be capable of operating all alarm notification appliances for 5 minutes.
 - 8.1.4 Alarm, trouble, and supervisory signals will be automatically transmitted to an approved supervising system.

9 Suppression: Sprinkler System

- 9.1 Per Sections 43.6.4.1 and 12.3.5.2 in NFPA 101-2015, the building will be equipped with a sprinkler system. The system will comply with applicable codes, including the Standard for the Installation of Sprinkler Systems (NFPA 13-2013).
- 9.2 Areas will be classified per Chapter 5 in NFPA 13-2013. These classifications are distinct from classifications found in other codes. Each classified area will comply with its applicable requirements, including requirements for flow, pressure, and hose streams.
- 9.3 The building will not be equipped with a stand pipe system.

10 **Suppression: Portable Fire Extinguishers**

- 10.1 Portable fire extinguishers will be provided throughout the building. They will be selected and maintained per the Standard for Portable fire extinguishers (NFPA 10-2013).
 - 10.1.1 ABC Type fire extinguishers will be installed per Chapter 6 of NFPA 10-2013. They will be readily accessible within 75 feet of all locations and possess a valid inspection sticker.
 - 10.1.2 Per Section 10.2.1 in the Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations (NFPA 96-2014), K Type fire extinguishers will be readily accessible in the kitchen and bakery.

11 **Lighting and Signage**

- 11.1 The means of egress will be illuminated whenever the building is occupied.
 - 11.1.1 The means of egress illumination level will be at least 1 foot-candle (11 lux) at the walking surface.
- 11.2 In the event of power failure, emergency lights will automatically illuminate the following areas:
 - 11.2.1 Aisles and unenclosed egress stairways.
 - 11.2.2 Corridors, exit enclosures and exit passageways.
 - 11.2.3 Interior exit discharge elements.
 - 11.2.4 Exterior egress components until exit discharge is accomplished.
- 11.3 The emergency power system will provide power for at least 90 minutes.
- 11.4 Exit and exit access doors will be marked with exit signs that are readily visible from any direction of egress travel.
- 11.5 Where necessary, the path of egress travel will be marked with exit signage.
 - 11.5.1 Rooms requiring only one exit will not be equipped with an exit sign in accordance with Section 1011.1, Exception 1, in IBC-2009.
- 11.6 No provision of NFPA 101-2015 requires egress path markings in the exit enclosure. Thus, they will not be provided.

12 **Interior Finish**

- 12.1 Wall and ceiling finish materials will be in accordance with Section 10.2 in NFPA 101-2009.
 - 12.1.1 Finishes will be Class B or better in exits.
 - 12.1.2 Finishes will be Class C or better in all other areas.
- 12.2 Combustible decorative materials will not cover more than 10% of the specific wall or ceiling area to which they are attached to.
- 12.3 Floors will have at least a Class II rating.

13 **Fire Rated Construction**

- 13.1 The building will be equipped with an automatic sprinkler system. Thus, corridors are not required to be fire rated.
- 13.2 The exit enclosure will be enclosed in 1-hour fire rated construction.
 - 13.2.1 The exit enclosure will be equipped with 1-hour fire rated door/frame assemblies. The fire doors will be equipped with closers.
 - 13.2.2 Exit enclosure penetrants will be firestopped in accordance with UL listed assemblies. They will be limited to equipment/systems serving the enclosure.
 - 13.2.3 Where necessary, exit enclosure joints will be sealed in accordance with UL listed assemblies.
- 13.3 Per Section 8.7 in NFPA 101-2015 and Table 508.2.5, areas of higher hazard (such as a mechanical room) will be protected by an automatic sprinkler system.

14 Protection from Hazards: Commercial Cooking Operations

- 14.1 Per Section 9.2.3 in NFPA 101-2015, commercial cooking operations will be protected in accordance with NFPA 96-2014.
- 14.2 Per Section 4.1.1 in NFPA 96-2014, cooking equipment used in processes producing smoke or grease-laden vapors will be equipped with an exhaust system. The exhaust system will include the following features:
 - 14.2.1 A well-designed airflow that terminates to the exterior of the building, in accordance with Section 7.8 of NFPA 96-2014.
 - 14.2.2 A grease removal device, in accordance with Section 6.2 of NFPA 96-2014.
 - 14.2.3 Clearances to combustibles (for hoods, grease removal devices, exhaust fans, and ducts), in accordance with Section 4.2 on NFPA 96-2014.
 - 14.2.4 Liquid tight, stainless steel construction, in accordance with Chapters 5 and 7 of NFPA 96-2014.
- 14.3 Per Section 10.2.1 in NFPA 96-2014, cooking equipment that produces grease-laden vapors will be protected by an automatic suppression system. A wet-chemical system will protect the hood exhaust plenums, grease removal devices, and exhaust duct systems.

15 Protection from Hazards: Mill Room

- 15.1 When speaking to code officials, many brewers avoid the term “milling” as it’s associated with higher hazard processes and therefore has a negative connotation. Many brewers use the term “grain crushing” instead of “milling” to accurately represent the process of crushing malt for mashing.
- 15.2 Per Section 40.3.2.1.2 in NFPA 1-2009, regular cleaning practices will be established for walls, floors, and horizontal surfaces (equipment, beams, ducts, etc.) to minimize dust accumulations within the brewery. During housekeeping and cleaning, procedures will be used which minimize dust cloud generation.
 - 15.2.1 The brewery will create a protocol to clean at a frequency that prohibits a layer of dust thicker than 1/32-inch. Such a thickness creates a dust explosion hazard per the Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids (NFPA 654-2006).
 - 15.2.2 Where dust hazards exist, portable vacuum cleaners will meet Class 2 hazardous location requirements per Section 40.3.2.3.1 in NFPA 1-2009.
- 15.3 The mill room will be enclosed to prevent the accumulation of dust throughout the facility.
- 15.4 The mill will be constructed of metal. To prevent the dispersal of fine particles, its hopper will be equipped with a lid.
- 15.5 The mill will use a dust-ignition-proof motor.
 - 15.5.1 Per Section 502.5 in the National Electric Code (NFPA 70-2014), explosion-proof equipment and wiring shall not be required and shall not be acceptable in Class 2 locations unless also identified for such locations.

16 Electrical Requirements

- 16.1 Housekeeping and dust containment will maintain combustible dust to a level which isn't hazardous. Thus, the mill room will be unclassified.
- 16.1.1 The remainder of the building will also be unclassified.

Respectfully Submitted,
Nortech Systems

[SEAL & SIGNATURE]

Mark R. Richards, PE
Fire Protection Engineer