



barrett architecture

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Bradford Town Hall

75 West Main Street
Bradford, New Hampshire
Tax Map 16 / Lot 92

Overall Architectural Building Code Review

August 31, 2017

Applicable Codes and Standards

- Applicable building codes to this project:
 - As per the New Hampshire State Building Code:
 - International Building Code, 2009 Edition (IBC) with NH Amendments.
 - International Existing Building Code, 2009 Edition (IEBC).
 - NFPA 101 Life Safety Code, 2015 Edition (NFPA) with NH amendments.
 - National Electrical Code, 2014 edition (NEC) with NH amendments.
 - International Mechanical Code, 2009 edition (IMC) with NH amendments.
 - International Energy Conservation Code, 2009 edition (IECC).
 - International Plumbing Code, 2009 edition (IPC) with NH amendments.
 - Other Applicable Codes and Standards:
 - The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring & Reconstructing Historic Buildings.
 - New Hampshire Fire Code including NFPA 1, 2009 edition.

Building Use

- Existing Building Use Groups:
 - Basement / Crawl Space IBC:
 - Unoccupied
 - Basement / Crawl Space NFPA:
 - Unoccupied.
 - First Floor IBC:
 - Business "B" Use Group (Municipal Offices)
 - Assembly "A-3" (Community Hall)
 - First Floor NFPA:
 - Existing Business (Municipal Offices)
 - Existing Assembly (Community Hall)
 - Second Floor IBC:
 - Assembly "A-3" (Community Hall)
 - Second Floor NFPA:
 - Existing Assembly (Community Hall)

POST OFFICE BOX 55 ■ 215 GATES-BRIGGS BUILDING

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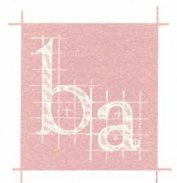
- Proposed Building Use Groups:
 - Basement IBC:
 - Moderate – Hazard Storage, Group “S-1”
 - Basement NFPA:
 - Storage Occupancies
 - First Floor: No changes of use or occupancy as per IBC or NFPA.
 - Second Floor: No changes of use or occupancy as per IBC or NFPA.
 - Any Incidental Accessory Uses as per IBC Table 508.2.5? No.

Building Floor Area

- Building Gross Square Foot Areas:
 - Basement: 4,252 s/f
 - First Floor: 4,252 s/f
 - Second Floor: 4,252 s/f

Building Construction Types and Allowable Height and Area

- Building Construction Type:
 - IBC Table 601: Type VB = Unprotected / Combustible
 - NFPA 220: Type V(000) = Unprotected / Combustible
- Is the building presently equipped with an automatic sprinkler system?
 - No.
- Is the building going to be equipped with an automatic sprinkler system?
 - Yes.
- Allowable Building Height and Area :
 - IBC Table 503:
 - B/VB = 9,000 s/f; 2 stories @ 40 feet total building height.
 - A-3/VB = 6,000 s/f; 1 story @ 40 feet total building height.
 - S-1/VB = 9,000 s/f, 1 story @ 40 feet total building height.
 - Allowable Building Height and Area applying IBC 504.2 Automatic Sprinkler System Increase:
 - B/VB = 9,000 s/f; 3 stories @ 60 feet total building height.
 - A-3/VB = 6,000 s/f; 2 stories @ 60 feet total building height.
 - S-1/VB = 9,000 s/f, 2 stories @ 60 feet total building height.
- Conclusion of Above: For purposes of applying the IBC, consider the entire first and second floor areas of the building as sprinklered “A-3” Assembly occupancy that in turn allows two (2) stories above grade at 60 feet of total building height and 6,000 gross square feet per floor.
- Other: NFPA Table 13.1.6 does allow assembly use below grade and the level of exit discharge.
- Construction Type Limitations – Existing Place of Assembly – NFPA Table 13.1.6:
 - Type V (000) construction, sprinklered, allows two (2) floors above grade, but limited to a second floor total occupant load of 300 persons or less.



Building Construction Types and Allowable Height and Area - Conclusion

For purposes of this building code review, classify the proposed building uses as follows:

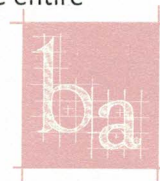
- Basement: "S-1" Storage / Fully Sprinklered (Assembly Use is allowed by NFPA).
- First Floor: "A-3" Assembly / Fully Sprinklered.
- Second Floor: "A-3" Assembly / Fully Sprinklered (NFPA limits the second floor to a 300 person maximum occupant load).

Required Building Fire Ratings

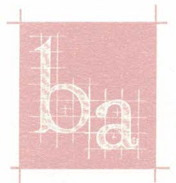
- Required fire separation ratings between uses as per IBC Table 508.4:
 - Between "A-3" Assembly and "S-1" Storage = One (1) Hour Fire Separation.
 - Between first floor "B" Business (municipal offices) and "A-3" Assembly area would typically require a one (1) hour fire separation; however, treating the entire first floor as "A-3" Assembly negates that requirement.
- Required fire ratings between uses as per NFPA 101 Table 6.1.14.1(a):
 - Between Assembly 300 persons or less and Low and Ordinary Storage requires a two (2) hour fire separation. NFPA requirement governs in this case and not IBC.
- Any Incidental uses that trigger fire ratings?
 - Not at this time.
- Any special detailed fire rating requirements based upon use and occupancy?
 - Not at this time.
- Applicable exterior wall fire ratings (IBC Table 602 and Table 705.8):
 - No. The closest building wall to a property line is at the rear and that is 36 feet.
- Interior stairwell fire rating (IBC 1022):
 - One (1) hour fire rating separating it from all interior spaces.
- Interior Elevator Shaft (IBC 708.4):
 - One (1) hour fire rating separating it from all interior spaces.

Building Occupant Load, Egress, and Stairs

- Building occupant load calculations(IBC Table 1004.1.1):
 - New Basement Area:
 - 4,252 s/f @ one (1) person per 500 gross s/f = 9 persons.
 - At this time there is no other use(s) planned for this floor of the building.
 - First Floor Area:
 - New Business Area (municipal offices):
 - 3,080 gross s/f divided by 100 = 31 persons occupant load.
 - New Assembly Area (community room):
 - 1,172 net s/f divided by 7 = 167 persons (concentrated – chairs only.
 - 1,172 net s/f divided by 15 = 78 persons (unconcentrated – tables and chairs)
 - Second Floor Area (auditorium and stage):
 - As per NFPA Table 13.1.6 the maximum allowable occupant load for the entire floor is 300 persons.



- Building egress (sprinklered building):
 - Exit Access Travel Distance:
 - IBC = 250 Feet
 - NFPA = 250 Feet
 - Common Path of Travel:
 - IBC = 75 Feet
 - NFPA = 75 Feet (See Section 13.2.5.1.2).
 - Dead End Corridors:
 - IBC = 20 Feet
 - NFPA = 20 Feet
- Steps and Stairs:
 - IBC:
 - Maximum Riser Height: 7"
 - Minimum Tread Depth: 11"
 - Minimum Stair Width: 3' – 8"
 - Minimum Landing Width at the Top and Bottom of the Stair: 3' – 8"
 - Minimum Headroom: 6' - 8"
 - Handrails requirements:
 - Required continuous on both sides of stair. .
 - Mounting height: Between 34" minimum and 38" maximum.
 - Diameter: Between 1 ¼" and 1 ½".
 - NFPA (Table 7.2.2.2.1(b) Existing Stairs):
 - Maximum Riser Height: 8"
 - Minimum Tread Depth: 9"
 - Minimum Stair Width: 3' - 0"
 - Minimum Landing Width at the Top and Bottom of the Stair: 3' - 0"
 - Minimum Headroom: 6' – 8" new and existing stairs.
 - Handrails required on one side only and same notes as above.
- Number of Exits:
 - IBC Section 1015 requires two (2) exits from the basement, first, and second floor levels with an occupant load more than 50 but less the 500.
 - NFPA Section 13.2.4. requires two (2) exits from the basement, first, and second floor levels with an occupant load no more the 600 persons.
- Egress Width:
 - IBC Section 1005.1 requires:
 - Minimum stair width = 3'-8".
 - Minimum corridor width = 3'-8".
 - NFPA:
 - Minimum existing stair width = 3'-0" [Table 7.2.2.2.1.1(b)].
 - Minimum new stair width = 3'-8" [Table 7.2.2.2.1.2(B)].
 - Minimum corridor width = 3'-8" (Table 13.2.3.2)

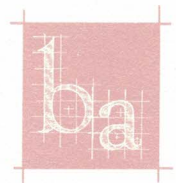


Interior Environment

- Sound Transmission Between Uses and Spaces(IBC):
 - Not applicable.
- Interior Finishes
 - IBC:
 - In exit enclosures and exit passageways = C Rating
 - In corridors areas = C Rating
 - In rooms and enclosed Spaces = C Rating
 - NFPA:
 - Same as IBC above.

Plumbing Fixture Requirements (IPC)

- First Floor:
 - 31 person occupant load for the “B” Business area = 16 men and 16 women;
Plus
 - Take the average between 167 concentrated and 78 unconcentrated occupant load for the “A-3” assembly area = 122 persons divided by 2 = 61 men and 61 women;
 - Total first floor occupant load for determining the minimum number of plumbing fixtures required:
 - 77 Men
 - 77 Women
- Second Floor:
 - 300 person total second floor occupant load = 150 men and 150 women.
- Basement Floor:
 - 9 person occupant load = 4 men and 4 women.
- Total building occupant load for determining the minimum of plumbing fixtures required:
 - 231 Men.
 - 231 Women.
- Minimum plumbing fixtures required for the entire building using “A-3” Assembly requirements:
 - Men’s Plumbing Fixtures:
 - 231 divided by 125 = (2) water closets.
 - 231 divided by 200 = (2) lavatories.
 - Women’s Plumbing Fixtures:
 - 231 divided by 65 = (4) water closets.
 - 231 divided by 200 = (2) lavatories.
 - Other required plumbing fixtures:
 - One (1) water fountain.
 - One (1) janitor’s sink.



- Minimum plumbing fixtures required if split between the first and second floor levels:
 - First floor total occupant load = 77 men and 77 women:
 - Men's plumbing fixtures:
 - 77 divided by 125 = (1) water closet.
 - 77 divided by 200 = (1) lavatory.
 - Women's plumbing fixtures:
 - 77 divided by 65 = (2) water closets.
 - 77 divided by 200 = (1) lavatory.
 - Second floor total occupant load = 150 men and 150 women.
 - Men's plumbing fixtures:
 - 150 divided by 125 = (2) water closets.
 - 150 divided by 200 = (1) lavatory.
 - Women's plumbing fixtures:
 - 150 divided by 65 = (3) water closets.
 - 150 divided by 200 = (1) lavatory.

Handi-Capped Accessibility

- A standard conventional elevator is required to provide HC access to the second floor. A Lula lift is not acceptable especially connecting three floors.
- Making the new east side entrance the accessible route into the building is acceptable, with HC accessible parking provided adjacent to it.
- Men's and Women's separate HC plumbing fixtures are required.
- All of the plumbing fixtures required for the building can be located on the first floor.

End of building Code Review

