

CASE STUDY 2 – Architectural Narrative

Vertical Enlargement

Project Description

Case Study 2 illustrates a 2-story vertical addition for office use (Occupancy Group B – Business) to a 3-story + cellar prior code department store (Occupancy Group M – Mercantile) constructed in 1925. The project includes an Alteration Level 1 in the existing building to accommodate the addition.

The site measures 200 ft. by 100 ft., fronting three streets. The existing building occupies the entirety of the site, so that the existing floor area is 80,634 SF (20,000 SF per floor x 4 levels plus bulkheads). The existing building has three exit stairs (Stairs A, B and C), three elevators (two passenger and one service), and two escalators. The height of the existing building is 44 ft. (16 ft. floor to floor height at the 1st floor, 14 ft. floor-to-floor heights at the 2nd and 3rd floors). The cellar has a floor-to-floor height of 16 ft.

The existing building is Construction Class 1 Fireproof (1938 Code), equivalent to 2022 BC Construction Type IB. The structure is a steel frame with draped-mesh reinforced concrete floor and roof slabs. The typical column grid is 20 ft. x 25 ft. The existing cellar is sprinklered; the 1st, 2nd and 3rd floors are unsprinklered. Stair C has a standpipe, but Stairs A and B do not have standpipes. The building is served by a gas-fired boiler in the cellar (converted from steam in a previous alteration) with hot water heating. Air-conditioning is provided by chillers and cooling tower installed on the roof.

The case study project is a 2-story vertical addition for office use (Occupancy Group B – Business). The footprint of the addition is 200 ft. by 80 ft., or 16,117 SF per floor and 33,038 SF floor area including bulkheads. The total gross floor area of the existing building plus the addition is 113,672 SF. The existing roof slab is removed, but the steel framing is maintained. A new 4th floor slab is provided as part of the addition. The height of the addition is 30 ft. (2 ft. for construction of the new 4th floor slab and 14 ft. floor-to-floor heights at the 4th and 5th floors). The total building height is 74 ft. The total height is less than 75 ft., so that the building is not classified as a high-rise.

The addition is Construction Type IB. The structure is steel frame with concrete slabs on metal deck floors and roof. The column locations match those of the existing building (20 ft. x 25 ft. grid). The addition 4th and 5th floors are sprinklered as well as the existing cellar, but the building is considered "unsprinklered" because the entire building is not sprinklered. Existing Stairs A and B are extended to provide two means of egress for the addition. Standpipes are added at Stairs A and B. Two new elevators serve the addition.

An Alteration Level 1 to the existing building is provided to accommodate the addition. Alterations include the new office entrance and lobby, new elevators, column reinforcement, partial floor slab repairs, and MEP/FP alterations. The roof slab above the existing 3rd floor is removed, but the existing steel framing is maintained. A new 4th floor slab is provided as part of the addition. Existing bulkheads are modified to match the new 4th floor level.

Scope of Work

The scope of work for this application includes:

- **Removals and modifications**
 - Floor openings at existing building slabs to accommodate elevators and services for the addition.
 - Removals / modifications / relocations of existing parapets, roof structures and mechanical equipment to accommodate the addition.
 - Removal of existing roof slab. Existing steel framing to remain.
 - Removal of Stair A and B bulkheads to accommodate the extension of the stairs.
 - Rebuilding Stair C and elevator bulkheads to integrate with the new 4th floor slab.
 - Exterior wall modifications to accommodate the 1st floor entrance to addition.
- **Architectural**
 - Construct two-story steel framed addition with concrete slabs on metal deck floors and roof.
 - Provide exterior wall enclosure and windows in compliance with NYC ECC requirements.
 - Provide roofing and insulation in compliance with NYC ECC requirements. Provide solar panels or green roof trays in compliance with NYC BC requirements.
 - Provide 1st floor entrance, vestibule and lobby serving the addition.
 - Provide two new elevators and hoistway enclosure serving the addition with stops at the 1st, 4th and 5th floors. One of the new elevators extends to the cellar.
 - Extend Stairs A and B to the roof of the addition, providing egress from the 4th and 5th floors and access to the roof. Provide stair bulkheads at roof of addition.
 - Provide elevator overrun and machine room bulkhead at the roof of the addition.
 - Provide no re-entry hardware Stairs A and B doors to prevent Group M occupants from accessing the Group B floors and vice-versa. Note: a CCD1 will be submitted to permit locking of doors on the stair side in Stairs A and B.
 - Provide 4th floor setback roofing, insulation and parapets. Modify existing Stair C and elevator bulkheads to match 4th floor level. Setback roof will be unoccupied.
 - Provide fireproofing at new and existing steel framing and at reinforced columns.
 - Provide accessible bathrooms and drinking fountains at the 4th and 5th floor addition.
 - Provide rated corridor with hollow metal doors and frames at the 4th and 5th floor addition.
 - 4th and 5th floor spaces to be finished as “white box” for future fit-out by tenants.
- **Structural** (see structural narrative)
 - Construct two-story steel framed addition with reinforced concrete on metal deck floor and roof slabs.
 - 4th floor is structured on the existing building roof framing members.
 - Provide framing for roof bulkheads and roof mounted equipment.
 - Provide concrete elevator pit for new elevator at cellar.
 - Repair deteriorated concrete floor slab with draped-mesh reinforcement at 2nd and 3rd floors.
 - Provide reinforcement of existing building columns as indicated.
 - Provide framing for new openings in existing building floor and roof slabs.

- **Plumbing**
 - Provide plumbing for bathrooms and drinking fountains in addition.
 - Provide plumbing for roof drainage at addition roof and bulkheads, 4th floor setback roof and 4th floor bulkhead roof.
- **Fire Protection**
 - Provide sprinklers for the 4th and 5th floor addition, provide sprinklers in 1st floor office lobby area, modify sprinkler layout in existing cellar as required.
 - Provide new fire pump and water service.
 - Provide standpipes in Stairs A & B, modify Stair C standpipe as required.
 - Provide new fire alarm system for existing building and addition.
- **HVAC** (see MEP narrative)
 - Relocate existing roof-mounted cooling tower from existing building roof to roof of addition.
 - Extend existing cooling tower system to serve new 4th and 5th floor addition spaces. Provide new distribution piping, air handlers or fan coil units, and controls for addition floors.
 - Upgrade existing gas-fired hot water boiler system to serve addition. Provide temporary unit heaters for 4th and 5th floors.
 - Provide new independent ventilation system for addition in accordance with NYC Mechanical Code Chapter 4 for new construction.
 - Provide new HVAC controls.
 - Modify ductwork and mechanical systems in existing building Level 1 Alteration work area to accommodate new lobby, elevator, and stair configurations.
 - New fuel pump system for new emergency generator required by addition of fire pump.
- **Electrical** (see MEP narrative)
 - Provide electrical service and distribution for the addition.
 - Provide common area lighting, emergency lighting, exit signs, lighting controls and receptacles for addition and lobby.
 - Modify lighting, emergency lighting, exit signs, lighting controls and receptacles in existing building as required.
 - Provide power and data distribution for addition and lobby.
 - Provide emergency generator, fuel oil tank and pumps.

EBC Applicability

The approach to a code review of this project starts with identification of the applicable EBC chapters and a determination of the type of alteration. The project involves a vertical addition, so that EBC Chapter 11 applies. The project also includes alterations within the existing building. As calculated in accordance with EBC Chapter 6 – Classification of Work, the work area is 25,496 SF. This represents 31.62% of the building area, less than 50% of the building area. The project is classified as an Alteration Level 1 per EBC Section 602.

The work area is 100% of the 3rd floor. This exceeds 50% of the area of that floor, so that the supplemental requirements of Chapter 8 apply to the 3rd floor, and an architectural condition assessment is required for that floor.

The applicable EBC chapters include:

- Chapter 1 – Administration
- Chapter 2 - Definitions
- Chapter 3 – Applicability and General Provisions.
- Chapter 7 – Structural, as relates to the structural scope of work.
- Chapter 8 – Alterations-Level 1.
- Chapter 11 – Additions.
- Chapter 15 – Additional Safeguards During Construction or Demolition for Existing Buildings and Occupied Buildings.

The NYC Construction Codes apply, as referenced in the EBC. In general, the EBC requires compliance with the NYC Construction Codes, with exceptions for certain existing conditions and for prior code buildings.

EBC Architectural Code Review

The code review for Case Study 2 is organized in three parts: the Addition; Alteration Level 1 in the existing building; and Additional Safeguards During Construction for Existing Buildings. Notes and comments are provided at the end of the narrative.

I. ADDITION

• General

- EBC 1101.1 – Scope. An addition to an existing building or structure shall comply with the NYC BC as required for new construction without requiring the existing building to be altered to meet such new construction requirements, except as required by this chapter.
 - The addition is designed to comply with NYC Building Code.
- EBC 1101.2 – Creation or extension of noncompliance. An addition shall not create or extend any noncompliance in the existing building to which the addition is being made.
 - The addition does not create or extend any noncompliance in the existing building.
- EBC 1101.3 – Other work. Any alteration work within an existing building to which an addition is being made shall comply with the applicable requirements for the work as classified in Chapter 6.
 - Work within the existing building is an Alteration Level 1.
- EBC 1101.4 – Work that increases floor surface area of an existing building by more than 110%. The addition does not increase the existing floor surface area by more than 110%. as analyzed in accordance with EBC Section 302.7.2.
 - $I = (FSAP - FSAR) / FSAR \times 100$
 - $(133,672 - 80,634) / 80,634 \times 100 = 65.78\% < 110\%$

- Note that the area of the removed existing roof slab does not count as floor surface area to. The new 4th floor replacing the existing roof slab counts as proposed floor surface area.
- EBC 302.7.2 Calculation of increase in floor surface area. See calculation under EBC 1101.4 above.
- EBC 303.6 Interior Environment. Alterations, additions, conversions and changes of use or occupancy shall comply with BC Chapter 12 and this code.
 - The addition complies with BC Chapter 12.
- **Heights and Areas**
 - EBC 1102.1 – Height limitations. No addition shall increase the height of an existing building beyond that permitted under the applicable provisions of BC Chapter 5 for new construction.
 - Per Table 504.3 allowable height for Groups B & M with Type IB construction are 160 ft. non-sprinklered.
 - Per Table 504.4 allowable number of stories for Groups B & M with Type IB construction is unlimited.
 - Complies. Proposed building height is 74 ft. and 5 stories.
 - EBC 1102.2 – Area limitations. No addition shall increase the area of an existing building beyond that permitted under the applicable provisions of BC Chapter 5 for new construction unless fire separation, as required by the BC, is provided.
 - Per BC Table 504.4 allowable area for Groups B & M with Type IB construction is unlimited.
 - Complies. Proposed total building area is 113,672 SF.
 - EBC 1102.5 – Existing buildings within the fire district. An existing building shall not be increased in height or area unless it is of a type of construction permitted for new buildings within the fire district.
 - Complies. Existing and proposed Construction Type IB complies. See Section 302.6 below.
 - EBC 302.6 – Existing buildings in fire districts. Alterations, additions, changes of use or occupancy and relocations of existing buildings inside the fire district, as described in BC Appendix D, shall be subject to BC Chapter 6 and Sections 302.6.1 and 302.6.2.
 - Complies. Existing and proposed Construction Type IB complies.
 - EBC 302.6.1 – Group H-1 prohibited. New Group H-1 occupancies shall be prohibited within the fire district.
 - Complies. No Group H-1 occupancy is proposed.

- EBC 306.2 – Changes to buildings. An existing building shall not be hereafter altered, increased in height or area, changed to a new use or occupancy, relocated or moved into the fire district unless such building is of a type of construction permitted for new buildings within the fire district in accordance with the BC.
 - Complies. Existing building (Group M occupancy) and proposed addition (Group B occupancy) of Construction Type IB complies with BC Chapters 5 and 6.
- **Structural**
 - EBC 1103 – see structural narrative.
- **Fire Protection**
 - EBC 1104 – see fire protection narrative.
- **Means of Egress**
 - EBC 1105.1 – General. Means of egress from an addition to an existing building or structure shall comply with BC Chapter 10 and with this section. Means of egress from additions shall be permitted to utilize existing exit facilities of the building or structure in accordance with Sections 1105.2 through 1105.3.
 - Complies. The addition extends the existing Stairs A and B as means of egress. Stairs A and B shall be in full compliance with BC Chapter 10 from highest level of addition to level of exit discharge and from the cellar level to the level of exit discharge.
 - EBC 1105.2 – The addition does not increase the existing floor surface area by more than 110%. Where the addition including alteration made to the building does not exceed the existing floor surface area by more than 110% per Section 302.7.2, the existing exit facilities shall be permitted to be utilized by the new addition to discharge onto the outside, subject to Sections 1105.2.1 and 1105.2.2. Such existing exit facilities shall be in compliance with the terms of their approval prior to the proposed addition.
 - Addition does not increase existing floor surface area by more than 110%. See analysis in Sections 302.7.2 and 1101.4.
 - EBC 1105.2.1 – Prior code buildings. Means of egress components serving the addition shall comply with BC Chapter 10 or as permitted by Section 305.5.
 - Complies. Means of egress serving the addition complies with BC Chapter 10 and EBC Section 305.5.
 - EBC 1105.2.1.1 – Vertical exits. In prior code buildings, existing vertical exits may be extended to serve the addition, maintaining its width, in compliance with Section 305.5 provided the occupant load of the new addition shall not exceed the capacity of the existing stairs.

- Complies. Extended Stairs A and B to serve the addition comply with EBC Section 305.5.
- EBC 305.5 – Special provisions for prior code buildings. Alterations, additions, changes of occupancy or relocations of prior code buildings that require changes to means of egress shall be permitted to comply with Sections 305.5.1 through 305.5.19 of this code. Other means of egress components shall comply with BC Chapter 10.
 - Complies. See EBC Section 305.5 analysis below.
- EBC 305.5.1 – Occupant load and exit capacity. The occupant load and exit capacity of prior code buildings or spaces shall be determined in accordance with BC Chapter 10.
 - Complies. Occupant load and exit capacity shall comply with BC Chapter 10.
- Occupant load is 100 GSF/occupant. Gross floor area of each of 4th and 5th floors is 16,117. Occupant load = $16,177/100 = 161$ occupants per floor.
 - Stair width required = $161 \times 0.3 = 48"$. Stair width provided = 88" (Stair A and B each 44").
 - Stair door width required = $161 \times 0.2 = 32"$. Stair door width provided = 72" (Stair A and B exit door each 36").
- EBC 305.5.2 – Accessible means of egress. Accessible means of egress are not required in prior code buildings where the level of alterations does not trigger full building compliance with the accessibility provisions of the BC.
 - Complies. Proposed addition does not trigger full building compliance with accessibility, as the increase in floor surface area does not exceed 110%, in accordance with Section 1106.2. Therefore, accessible means of egress are not required.
- EBC 305.5.3 – Remoteness. Alterations that result in the same or a lesser hazard occupancy category as described in EBC Section 1005 may maintain the existing remoteness of exits.
 - Complies. Remoteness of Stairs A & B serving occupancy Group B is in compliance with BC Chapter 10. Occupancy Groups M and B are both classified as hazard category 3 per EBC Table 1005.2.
- EBC 305.5.4 – Travel distance. The maximum travel distance measured from the most remote point within a story along the natural and unobstructed path of egress travel to an exterior exit door at the level of exit discharge, an entrance to an interior exit stairway, interior exit ramp, exit passageway, horizontal exit, exterior exit stairway, or exterior exit ramp shall not exceed the limits specified in BC Chapter 10.
 - Complies. Travel distance in the addition complies with BC Chapter 10.
 - Group B maximum travel distance: 200 ft. in unsprinklered buildings per BC Table 1017.2. Although the cellar is sprinklered and the 4th & 5th floors will be

sprinklered, the entire building is considered “unsprinklered” because the 1st, 2nd and 3rd floors are not sprinklered.

- Proposed maximum travel distance on 4th & 5th floors: 179 ft.
- EBC 305.5.11 – Stairs. New or relocated stairs shall comply with BC Chapter 10 unless otherwise provided for in this code. Alteration or vertical extension of existing stairs shall comply with Section 305.5.11.1.
 - Applies to the extension of Stairs A and B to the addition floors.
- EBC 305.5.11.1 – Stair width. The width of existing stairs shall be measured as the clear width between walls, grilles, guards, or newel posts. Stair stringers may project into the required width not more than 2 inches on each side of the stair. Alterations to existing stairs shall maintain a minimum width of 44 inches.
 - Complies. Existing Stairs A and B are 44 inches wide and extensions of the stairs to the 4th & 5th floors and roof of the addition maintain a width of 44 inches.
- EBC 305.5.11.2 – Riser height and tread depth. Riser height and tread depth for new stairs and vertical extension of existing stairs shall comply with BC Chapter 10. Alteration or replacement within the same shaft made to existing stairs where the existing space and construction does not allow a reduction in pitch or slope shall be permitted to maintain the existing riser height and tread depth and shall comply with Table 305.5.11.2. Riser height and tread depth shall be constant from story to story.
 - Due to the size of the existing stair shafts, treads (11") and risers (7") in accordance with BC Chapter 10 cannot be achieved. Riser height of 7.5" and tread depth of 10" are provided at Stair A & B extensions to the 4th & 5th floors to match the riser and tread dimensions of the existing stair runs. Riser height and tread depth are constant from story to story between the existing building and the addition to maintain safe exit travel for occupants.
 - **Note:** *DOB interpretation / clarification of Section 305.5.11.2 is required to confirm that max. riser height and min. tread depth for prior code buildings is permitted for Stairs A and B extensions.*
- EBC Table 305.5.11.2 – Max. Riser Height and Min. Tread Depth in Prior Code Buildings. Max. riser height: 7-3/4"; min. tread depth: 9-1/2" + nosing; $2R + 1T > 24"$ and $< 25-1/2"$.
 - Complies. Riser height: 7.5". Tread depth: 10". Calculation: $2 \times 7.5" + 1 \times 10" = 25"$.
- EBC 305.5.13 – Handrails. Where handrails are altered or added, they shall comply with BC Chapter 10.
 - Complies. Handrails at Stair A and B extensions and within existing Stair A and B stair runs comply with BC Chapters 10 & 16.

- EBC 305.5.14 – Guards. Where the alteration or repair of a building involves the addition or replacement of guards, such guards shall comply with BC Chapters 10 and 16.
 - Complies. Guards at Stair A & B extensions and within existing Stair A and B stair runs comply with BC Chapters 10 & 16.
- BC 1010.1.9.11 – Stairway doors. Interior stairway means of egress doors shall be openable from both sides without the use of a key or special knowledge or effort.
 - Stairway doors are locked on stair side, subject to BC 1010.1.9.11, Exception 2 and BC 403.5.3. See below.
- BC 1010.1.9.11 – Exception 2. This section shall not apply to doors arranged in accordance with Section 403.5.3.
 - The Owner requests a separation of the Group M and B occupancies for security reasons. A CCD1 will be requested to permit the locking of stairway doors on the stair side in Stairs A and B in accordance with the provisions of BC 403.5.3, as detailed below.
- BC 403.5.3 – Stairway door operation. A door locked from the stair side may be permitted provided that such door is equipped with an automatic fail-safe system for opening in the event of the activation of any automatic fire detection system, or when any elevator recall is activated, or when any signal is received from the fire command center. Such door shall be deemed as openable from the stair side. Stair reentry signs shall be posted throughout the stairway indicating that reentry is provided only during fire emergencies.
 - Stairs A and B doors are equipped with an automatic fail-safe system for opening in the event of the activation of any automatic fire detection system, or when any elevator recall is activated, or when any signal is received from the fire command center. Stair reentry signs shall be posted throughout the stairway indicating that reentry is provided only during fire emergencies.
- BC 403.5.3.1 – Stairway communication system. A two-way voice communications system connected to an approved constantly attended station shall be provided at not less than every fifth floor in each stairway where the doors to the stairway are locked in accordance with Section 403.5.3.
 - A two-way voice communications system is provided in Stairs A and B.
- **Accessibility**
 - EBC 306.1 Compliance. Alterations, including minor alterations, repairs excluding ordinary repairs, and alterations affecting an area containing a primary function, changes of use or occupancy, additions and relocation of existing buildings, shall comply with BC Chapter 11 and this code.
 - Complies. Addition is designed to be accessible in accordance with BC Chapter 11.

- EBC 1106.1 – Minimum requirements. Accessibility provisions of BC Chapter 11 for new construction shall apply to additions. An addition that affects the accessibility to, or contains an area of, primary function shall also comply with the requirements of Sections 806 and 906, as applicable.
 - Complies. Addition is designed to be accessible in accordance with BC Chapter 11.
 - **Note:** *Portions of the existing building being altered, including the 1st floor new lobby, are addressed under the Alteration, Level 1 section of this narrative.*
- EBC 1106.2 – Additions requiring accessibility throughout a building. Where an addition, including any alteration made to the building, increases the existing floor surface area of the existing building by more than 110%, the entire building shall be made to comply with BC Chapter 11 as if it were new construction hereafter erected.
 - Not applicable, work does not increase the floor surface area by more than 110%.
- **Energy Conservation**
 - EBC 1107.1 – Minimum requirements. Additions to existing buildings shall conform to the energy requirements of the NYC Energy Conservation Code as they relate to new construction.
 - Complies. Addition is designed to comply with NYC Energy Conservation Code.
- **Other Building Systems**
 - EBC 1108 – see MEP Narrative.

II. **EXISTING BUILDING – ALTERATION LEVEL 1**

- **General**
 - General. Where the work area on any floor exceeds 50% of that floor area, the supplemental requirements of Chapter 8 apply.
 - The work area does not exceed 50% of the area of the cellar, 1st and 2nd floors. The work area does exceed 50% of the 3rd floor area, so that supplemental requirements apply to the 3rd floor.
 - EBC 302.4 New and replacement materials, assemblies and details. Except as otherwise required or permitted by this code, materials, assemblies, and details permitted by the NYC Construction Codes shall be used.
 - Exception: For partial and restorative repairs, where such repairs are necessitated by deteriorating façade or roof conditions and are required by the NYC Construction Codes, like materials, assemblies and details are permitted if no unsafe condition is created...

- Complies. Partial existing building façade repairs incorporate like materials, assemblies and details as permitted by the Exception to Section 302.4.
- EBC 302.6 – Existing buildings in fire districts. Alterations, additions, changes of use or occupancy and relocations of existing buildings inside the fire district, as described in BC Appendix D, shall be subject to BC Chapter 6 and Sections 302.6.1 and 302.6.2.
 - Complies. Existing Construction Type IB complies. See Addition analysis above.
- EBC 801.3 – New and replacement materials, assemblies and details. Materials, assemblies and details for all new work shall comply with Section 302.4.
 - Complies. Materials, assemblies and details used within the work area comply with the NYC Construction Codes.
- EBC 302.4 – New and replacement materials, assemblies and details. Except as otherwise required or permitted by this code, materials, assemblies, and details permitted by the NYC Construction Codes shall be used...
 - Complies. Materials, assemblies and details used within the work area comply with the NYC Construction Codes.
- EBC 302.7.2 Calculation of increase in floor surface area. To determine the percentage by which the floor surface area is increased, the following formula shall be used:
 - $I = (FSA_P - FSA_R) / FSA_R \times 100$
 - Complies. Increase in floor surface area does not exceed 100%. See analysis in Addition section above.
- **Building Elements and Materials**
 - EBC 303.2 Fire resistive elements. The fire-resistance ratings of existing building elements and materials shall not be reduced.
 - Complies. The fire-resistance rating of existing building elements is maintained.
 - EBC 303.6 Interior environment. Alterations, additions, conversions and changes of use or occupancy shall comply with BC Chapter 12 and this code.
 - Complies. The alteration complies with BC Chapter 12.
 - EBC 801.3 New and replacement materials, assemblies and details. Materials, assemblies and details for all new work shall comply with Section 302.4.
 - Complies. Materials, assemblies and details used within the work area comply with the NYC Construction Codes.
 - EBC 803.2 - Shafts and vertical openings. Existing shafts and vertical openings shall comply with the provisions of BC Chapter 7 except as stated in Sections 803.2.1 through 803.2.3 for prior code buildings.

- Provisions for prior code buildings apply. Existing shafts within the work area are limited to plumbing risers and the boiler flue and are enclosed in 2-hr fire rated construction.
- EBC 803.2.1 – Existing shafts and vertical openings in prior code buildings. Existing shafts and vertical openings that are lawfully enclosed in accordance with a prior code shall not be reduced in fire-resistance rating.
 - Complies. Existing and new shafts and vertical openings within the work area are enclosed with 2 hr. fire-rated construction and rating is not reduced.
- EBC 803.2.2 – Supplemental shaft and floor opening enclosure requirements. Where the work area on any floor exceeds 50% of that floor area, the enclosure requirements of Section 803.2 shall apply to vertical openings other than stairways throughout the floor.
 - Complies. Supplemental requirements apply to 3rd floor. All vertical openings comply with the enclosure requirements of Section 803.2.
- EBC 803.2.3 – Supplemental stairway enclosure requirements in prior code buildings. Where the work area on any floor exceeds 50% of that floor area, stairways that are part of the means of egress serving the work area shall, at a minimum, be enclosed with 1-hour fire rated construction on the highest work area floor and all floors below.
 - Complies. Supplemental requirements apply to 3rd floor. Stairs A, B and C have 2-hour rated enclosures at the 3rd floor and all floors below.
- EBC 803.4 – Interior finish. The interior finish of walls and ceilings in exits and corridors in the work area shall comply with the NYC BC Chapter 8.
 - Complies. Interior finishes in Stairs A and B and new elevator lobby on 1st floor are in accordance with BC Table 803.11 Class “A” finishes for unsprinklered buildings.
- EBC 803.4.1 – Supplemental interior finish requirements. Where the work area on any floor exceeds 50% of the floor area, Section 803.4 shall also apply to the interior finish in exits and corridors serving the work area throughout the floor.
 - Complies. Supplemental requirements apply to 3rd floor. Interior finishes in Stairs A, B and C serving the work area throughout the floor are in accordance with BC Table 803.11 Class “A” finishes.
- EBC 803.9 – Existing buildings in fire districts. Alterations made to existing buildings shall comply with Section 302.6 and Sections 803.9.1 through 803.9.3.
 - Complies. See Addition portion of this narrative for compliance with Section 302.6 and below for compliance with Section 803.9.1 and 803.9.2. Section 803.9.3 is not applicable.
- EBC 803.9.1 – Construction type. Every existing building, room, or space hereafter altered shall be of a construction type as indicated in BC Chapter 6 including the

required fire resistance rating of bearing walls, floors, roofs and their supporting structural members.

- Complies. Existing and proposed Construction Type IB complies.
- EBC 803.9.2 – Roof covering. Roof covering in the fire district shall conform to the requirements of Class A or B roof coverings as defined in BC Section 1505.
 - Complies. Roof coverings at the addition (4th floor setback roof and main roof) are Class A.
- EBC 803.10 – Architectural condition assessment. Where a building is being altered and the work area exceeds 50% of the floor area, the registered design professional of record shall visually assess the condition of fire-resistant building elements and assemblies within the work area, and egress elements serving the work area on that same story.
 - Complies. Supplemental requirements apply to 3rd floor, where the work area exceeds 50% of the floor area. See Architectural condition assessment report.
- **Fire Protection**
 - EBC 804 – see fire protection narrative.
- **Means of Egress**
 - EBC 805.1 – Scope. The requirements of this section shall be limited to work areas that include exits or corridors shared by more than 1 tenant within the work area in which Level 1 alterations are being performed.
 - Work area does not include exits or corridors shared by more than one tenant.
- **Accessibility**
 - EBC 306.1 – Compliance. Alterations, including minor alterations, repairs excluding ordinary repairs, and alterations affecting an area containing a primary function, changes of use or occupancy, additions and relocation of existing buildings, shall comply with BC Chapter 11 and this code.
 - See Section 806 analysis below.
 - EBC 306.1.2 – Alterations affecting an area containing a primary function. Alterations affecting an area containing a primary function shall comply with Section 806.3.
 - Complies. See Section 806.3 analysis below.
 - EBC 806.2 – Compliance. A facility that is altered shall comply with the applicable provisions in Sections 806.2.1 through 806.2.14 of this code and Chapter 11 of the NYC BC to the extent of the alteration.
 - Complies. See Sections 806.2.1 and 806.2.12 below.

- EBC 806.2.1 – Entrances and accessible routes. Where an alteration includes alterations to an entrance or a route that would be required to be accessible by this code, such entrance and route shall be made accessible in accordance with BC Chapter 11.
 - Complies. New office lobby on 1st floor is accessible and provides an accessible route to the office floors of the addition.
- EBC 806.2.12 – Thresholds. The maximum height of thresholds at doorways shall be in accordance with ICC A117.1.
 - Complies. Thresholds at new office lobby entrance doors are in accordance with ICC A117.1.
- EBC 806.3 – Alterations affecting an area containing a primary function. Where an alteration affects the accessibility to or contains an area of primary function, the route to the primary function area, including entrances, shall be accessible in accordance with this section and Section 806.3.1 – Path of travel prioritization.
 - Complies. The route to the area of primary function from the office entrance and lobby via the new elevators to the office floors is accessible.
- **Structural**
 - EBC 807 – see structural narrative.
- **Electrical**
 - EBC 808 – see electrical narrative.
- **Mechanical**
 - EBC 809 – see mechanical narrative.
- **Plumbing**
 - EBC 810 – see plumbing narrative.
- **Fuel Gas Systems**
 - EBC 811 – see fuel gas systems narrative.
- **Elevators and Conveying Systems**
 - EBC 812.1 – General. Alterations made to existing elevators and conveying systems shall comply with Chapter 30 and ASME A17.1 as modified by Appendix K of the NYC BC, as applicable, and this section.
 - New elevators within work area comply with BC Chapter 30 & ASME 17.1 as modified by BC Appendix K.

- Work related to existing elevators for this application is limited to elevator overruns and machine room modifications due to rebuilding the existing bulkheads.

- **Energy Conservation**

- EBC 813.1 – Minimum requirements. Level 1 alterations are permitted without requiring the entire building to comply with the energy requirements of the NYC Energy Conservation Code. Level 1 alterations shall conform to the energy requirements of ECC Chapters R5 or C5, Existing Buildings.
- Complies. See energy code analysis.

- **Chapter 15 – Additional Safeguards During Construction or Demolition for Existing Buildings and Occupied Buildings**

- EBC 1502.1 – Occupant protection required. When construction or demolition activity occurs in an occupied building... protective means shall be installed and maintained as necessary to provide reasonable protection for the occupants against hazard and nuisance.
 - Not applicable. Building will be vacant during demolition and construction.
- EBC 1504.1 – Occupant protection plan - Where required. Alteration, construction, or partial demolition work performed in a building that will be occupied during the work... shall be conducted in accordance with an occupant protection plan.
 - Not applicable. Building will be vacant during demolition and construction.
- EBC 1505.1 – Maintenance of means of egress. Means of egress shall be maintained at all times during construction or demolition operations in occupied buildings.
 - Not applicable. Building will be vacant during demolition and construction. Means of egress are maintained for workers.
- EBC 1506.1 - Sprinkler systems during alteration or demolition. Existing sprinkler systems in buildings undergoing an alteration or demolition shall comply with the requirements of BC Section 3303.7.4 and EBC Section 1506.2.
 - Complies. See Fire Protection code analysis.

- **Notes and Comments**

1. Work area determination.

- a. EBC Section 601.2.3.1, Exception 2 states that where the space being reconfigured constitutes 10% or less of the total area of a room or floor that the reconfigured space is a part of, the work area shall be limited to the space being reconfigured. Calculations on the drawings show that each work area is less than 10% of the room in which it is located, except for the 3rd floor, where the work area is the entire floor.
- b. The removal of the existing roof slab qualifies the entire existing 3rd floor as work area. The work in the existing building is classified as an Alteration Level 1, because the total work area is less than 50% of the total building floor area. However, since the work area at the 3rd floor exceeds 50% of the area of that floor, the 3rd floor is subject to the supplemental requirements of Chapter 8.
- c. As part of the structural scope of work the interior columns in the existing building are being reinforced. To allow for the removal of the existing column enclosures and fireproofing and installation of fireproofing and new column enclosures, a 2 ft. x 2 ft. (4 SF) work area is provided at each column.
- d. The removal of the existing roof slab and construction of the new 4th floor roof slab 2 ft. above the level of the existing roof slab requires modifications to the existing Stair A & B, elevator and elevator machine room bulkheads to raise their level to the new 4th floor level. The modifications to Stairs A & B and the elevator hoistway count as work area at the 3rd floor.
- e. Modifications to the exteriors of the existing bulkheads does not count as work area per EBC Section 601.2.3.2 – Exterior work (Building envelope). This section states that “alteration of the exterior walls and roof shall not be considered as work area in determining Level 1 and Level 2 alterations.”

2. Floor surface area determination.

- a. The area of the removed existing roof slab does not count as floor surface area to remain (FSAR).
- b. The new 4th floor and setback roof slab replacing the existing roof slab counts as floor surface area proposed (FSAP).

3. Riser height and tread depth for Stairs A and B extensions.

- a. EBC Section 305.5.11.2 – Riser height and tread depth states:
- b. Riser height and tread depth for new stairs and vertical extension of existing stairs shall comply with Chapter 10 of the NYC Building Code. Alteration or replacement within the same shaft made to existing stairs where the existing space and construction does not allow a reduction in pitch or slope shall be permitted to maintain the existing riser height and tread depth and shall comply with Table 305.5.11.2. Riser height and tread depth shall be constant from story to story.

- c. Due to the size of the existing stair shafts, treads (11") and risers (7") in accordance with BC Chapter 10 cannot be achieved at the Stair A & B extensions to the 4th & 5th floors.
 - d. Riser height of 7.5" and tread depth of 10" are provided at the Stair A & B extensions match the riser and tread dimensions of the existing stair runs. Riser height and tread depth are constant from story to story between the existing building and the addition to maintain safe exit travel for occupants.
 - e. Interpretation: DOB interpretation / clarification of Section 305.5.11.2 is required to confirm that maximum riser height and minimum tread depth for prior code buildings is permitted for the Stair A & B extensions to the addition.
4. Stairway door operation.
- a. The Owner requests a separation of the Group M and B occupancies for security reasons, so that occupants of one occupancy cannot enter the other occupancy.
 - b. BC 1010.1.9.11 – Stairway doors states that interior stairway means of egress doors shall be openable from both sides without the use of a key or special knowledge or effort. Exception 2 states that this section shall not apply to doors arranged in accordance with BC Section 403.5.3.
 - c. Per BC Section 403.5.3, Stairs A and B doors are equipped with an automatic fail-safe system for opening in the event of the activation of any automatic fire detection system, or when any elevator recall is activated, or when any signal is received from the fire command center. Stair reentry signs shall be posted throughout the stairway indicating that reentry is provided only during fire emergencies.
 - d. Per BC Section 403.5.3.1, a two-way voice communications system connected to an approved constantly attended station is provided at not less than every fifth floor in Stair A & B.
 - e. Interpretation: A CCD1 will be requested to permit the locking of stairway doors on the stair side in Stairs A and B in accordance with the provisions of BC 403.5.3, although this building is **not** classified as a high rise.