

CASE STUDY 1 – Architectural Narrative

Office Fit-Out

Project Description

Case Study 1 illustrates a Level 1 Alteration in a prior code office building. This high-rise building is comprised of 9-stories plus a cellar, with a gross floor area of 8,800 sf per floor and a total building area of 88,000 sf. The building was completed in 1971 under the 1968 NYC Building Code. Per the existing certificate of occupancy, its dominant occupancy is Group B (Group E under the 1968 code), its construction type is I-B (I-C under the 1968 code), and the building is fully sprinklered. The building has two exit stairs and two elevators. Its structural system is a steel frame supporting cast-in-place concrete floor slabs. As defined by the NYC Administrative Code, the building is considered a prior code building.

The case study's architectural scope includes the partial renovation of the 6th floor and full renovation of the 7th floor for a commercial office tenant. There is no change in use, occupancy, or egress. The occupant load will be maintained at 70 persons per floor, per the existing certificate of occupancy.

The project includes repairs to Stair B between the 6th and 7th floors. There will be no alterations to Stair A, nor the existing elevators. The scope of the project does not include any exterior wall work. It is assumed that the building owner has delivered the spaces as a "white box," so that no demolition or hazardous material abatement is required.

Scope of Work

The scope of work for this application includes the following:

- Construction of non-load bearing interior gypsum board on steel stud partitions.
- Installation of hollow metal doors, frames and hardware.
- Installation of floor and wall finishes.
- Installation of suspended ceilings and lighting fixtures, including patching and painting of exposed ceiling surfaces.
- Renovation of the 7th floor toilet rooms for accessibility compliance, including the replacement of plumbing fixtures, accessories, toilet partitions, new floor and wall finishes, and suspended ceiling with light fixtures, etc.
- Installation of new drinking fountain and bottle filling stations at the 6th and 7th floors.
- Construction of 6th and 7th floor pantries, with sinks.
- Repairs to Stair B, between the 6th and 7th floors. This includes the repair of treads, risers, handrails, guards, and wall finishes; and the installation of new exit doors and closers to Stair B at the 6th and 7th floors.

- Installation of new supplemental reinforcing beams to accommodate new floor live loads from mechanical equipment, safes and data center equipment. *See Structural Narrative.*
- Installation and/or modifications of sprinkler and fire alarm systems within the work area at the 6th and 7th floors. *See Fire Protection Narrative.*
- Installation and/or modifications of electrical systems within the work area at the 6th and 7th floors, *See MEP Narrative.*
- Installation of and modifications to plumbing work within work area at the 6th and 7th floors. *See MEP Narrative.*
- Installation of and modifications to central air-conditioning/ventilation system within the work area at the 6th and 7th floors. *See MEP Narrative.*

EBC Applicability

A code review of this project starts with a determination of the type of alteration, thus establishing the applicability of EBC provisions. As calculated in accordance with EBC Chapter 6 – Classification of Work, the work area is 3,461 sf on the 6th floor and 7,878 sf on the 7th floor; totaling 11,339 sf. This represents 12.89% of the building area. With a work area less than 50% of the building area, the project is classified as an Alteration Level 1. *See EBC Section 602.*

The work area on the 7th floor exceeds 50% of the area of that floor ($7,878/8,800 = 89.5\%$), triggering the applicability of Chapter 8 supplemental requirements. Those supplemental requirements apply throughout the floor, where the work area exceeds 50% of that floor area. For example, the shaft and floor opening enclosures, and stairway enclosures shall be made to comply throughout the floor.

EBC Section 803.10 requires an architectural condition assessment of the 7th floor work area because it exceeds 50% of that floor area. The assessment includes elements such as shafts, vertical openings and stair enclosures, fire walls and fire rated partitions including penetrations, protection of lot line windows, and fire escapes.

In addition to the determination of work area in Chapter 6, this Alteration Level 1 project is also governed by the applicable provisions of the following EBC chapters:

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

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

EBC Architectural Code Review

The code review for Case Study 1 includes the following sections. Notably, the supplemental requirements are applicable only to the 7th floor, where the work area exceeds 50% of that floor area.

- **Fire resistive elements.** (EBC Section 303.2).
 - The fire-resistance rating of existing building elements must not be reduced.
- **Interior environment.** (EBC Section 303.6).
 - The alteration must comply with BC Chapter 12.
- **New and replacement materials** (EBC Sections 302.4 and 801.3).
 - New or replaced materials used within the work area shall comply with the NYC Construction Codes.
- **Building Elements and Materials** (EBC Sections 303 and 803).
 - Existing shaft and vertical openings (EBC 803.2). All existing shafts and stairs are enclosed in 2-hour-rated walls and assemblies.
 - Supplemental requirements (EBC 803.2.2 and 803.2.3): all existing shafts and stairs throughout the floor are enclosed in 2-hour-rated walls and assemblies. *Note, Stair A is not part of the work area.*
 - Interior finishes (EBC 803.4). Interior finishes within the work area in occupied spaces, elevator lobby / corridor, and Stair B shall comply with BC Chapter 8.
 - Supplemental requirements (EBC 803.4.1): Interior finishes in exits and corridors serving the work area throughout the floor shall comply with BC Chapter 8.
 - Architectural condition assessment (EBC 803.10). Since the work area on the 7th floor exceeds 50% of the floor area, an Architectural Condition Assessment is required. *See assessment report.*
- **Existing buildings in fire districts** (EBC Sections 302.6 and 803.9).
 - Existing Construction Type IB complies with BC Chapters 5 & 6.
- **Fire Protection** (EBC Sections 304 and 804).
 - *See Fire Protection Narrative.*
- **Egress** (EBC Sections 305 and 805).
 - **Special provisions for prior code buildings** (EBC 305.5). Alterations to prior code buildings that require changes to the means of egress shall be permitted to comply with Sections 305.5.1 through 305.5.19. Work is limited to the repairs of treads and risers in kind at the 6th – 7th floor runs in Stair B; repairs to handrail and guardrail sections in Stair B at

the 6th – 7th floor runs; repairs to wall finishes within the stairway; and new door closers at the 6th and 7th floor stair doors.

- **Travel distance** (EBC 305.5.4): Travel distances shall comply with BC Chapter 10. The maximum travel distance is limited to 300 ft. per BC Table 1017.2. No change to travel distance is proposed.
- **Required number of exits or exit access doorways in prior code buildings** (EBC 805.4.1.1). No change. The required number of exits and exit access doorways are provided. Two exits at each floor provided.
- One exit door is provided from 6th floor work area for 35 occupants (3,461 SF / 100 = 35 occupants). Two exit doors are provided from the 7th floor work area for 82 occupants (8,800 – 600 SF exterior wall area = 8,200 SF / 100 = 82 occupants). However, the 7th floor is limited to 70 persons by the existing certificate of occupancy.
- **Door swing** (EBC 805.4.2). Exit access doors from tenant spaces swing in the direction of egress.
- **Supplemental requirements** (EBC 805.4.2.1): All exit doors at the 7th floor swing in the direction of egress.
- **Door closing** (EBC 805.4.3). Doors to Stair B at 6th and 7th floors shall be provided with self-closing mechanism as per EBC 805.4.3.
- **Supplemental requirements** (EBC 805.4.3.1): The building owner shall certify that all other fire doors, from the level of the work area to the level of exit discharge, are provided with self-closing mechanisms.
- **Corridor doors** (EBC 805.5.1). Doors to corridor / elevator lobby comply with BC 1010 and BC 1020. *(Note: Exception 1 to EBC 805.5.1 permits doors in sprinklered buildings to only resist smoke, be reasonably tightfitting and with no louvers; however, doors are rated per BC 1010 and BC 1020.)*
- **Supplemental requirements** (EBC 805.5.4): Requires all corridor doors at the 7th floor to comply with BC 1010 and BC 1020. Both doors comply.
- **Means of egress lighting** (EBC 805.7). Shall comply with BC Chapter 10. Artificial lighting in accordance with BC Chapter 10 is provided.
- **Supplemental requirements** (EBC 805.7.1). Requires the entire 7th floor to comply with EBC 805.7. The project team determined that no upgrade was required.
- **Exit signs** (EBC 805.8.1). Means-of-egress in work areas shall be provided with exit signs in accordance with the requirements of BC Chapter 10. The project team determined that no upgrade was required.
- **Supplemental requirements** (EBC 805.8.2). Requires entire 7th floor to comply with EBC 805.8.1. The project team determined that no upgrade was required.
- **Handrails** (EBC 805.9.1). Existing damaged handrails in Stair B at the runs between the 6th and 7th floors must be repaired to provide adequate attachment in accordance with

EBC 305.5.13 and EBC 805.9. Other handrails in Stairs A and B from the work area to the level of exit discharge are adequate in strength and attachment.

- Damaged handrail at the runs between the 6th and 7th floors in Stair B is repaired. Other existing handrails in Stairs A and B comply.
- **Guards** (EBC 805.11). The section of stair guardrail between the 6th and 7th floors in Stair B with inadequate support must be repaired in accordance with EBC 805.11.1. Other existing guards in Stairs A and B from the work area to the level of exit discharge comply.
- **Travel distance** (EBC 305.5.4): Travel distances shall be in compliance with BC Chapter 10. The maximum travel distance is 300 feet, per BC Table 1017.2. The project team determined that no upgrade was required.
- **Accessibility** (EBC Sections 306 and 806).
 - Requirements are based on the extent of alterations (EBC Section 306.1).
 - Accessible features and construction governed by BC Chapter 11 are provided to the portion of the building being altered or repaired, to the extent of the alteration.
 - Accessibility improvements are required along the route to the primary function area, including accessible toilets at the 7th floor and accessible pantries at both the 6th and 7th floors.
 - Alterations affecting an area containing a primary function (EBC 806.3). Where an alteration affects the accessibility to or contains an area of primary function, the route to the primary function area shall be accessible.
 - A primary function is a major activity for which the facility is intended and includes the office areas of the project.
 - The building's route to the area of primary function is accessible, provided by existing elevators.
 - The accessible route to the primary function area shall include toilet facilities and drinking fountains serving the area of primary function. Toilet facilities at the 7th floor are altered to be accessible. These facilities are accessible to occupants of both the 6th and 7th floors. Drinking fountains with bottle fillers are provide at the 6th and 7th floors.
 - The costs of providing the accessible route are not required to exceed 25% of the costs of the alterations affecting the area of primary function.
 - The estimated cost of this Level 1 Alteration is \$1,133,900. The cost of improvements along the path of travel to the primary functions = \$200,000 about 17.6% of the cost of alteration.
 - Path of travel prioritization (EBC 806.3.1).
 - The cost of improvements along the path of travel shall be prioritized in accordance with the following:
 - Accessible entrances.

- Accessible route to the altered area.
- Accessible toilet facilities.
- Accessible drinking fountains and bottle-filling stations.
- Accessible telephones.
- Additional items such as parking, storage and alarms.
- Since the existing building entrance and elevators were made accessible under previous projects, the project team proposes to improve the accessible route to the 6th and 7th office floors with:
 - Renovated, accessible toilet facilities on the 7th floor.
 - Accessible drinking fountains / bottle-filling stations at the 6th & 7th floors.
 - Alarms at the 6th & 7th floors.
- **Structural** (EBC Sections 307, 807, Ch. 7).
 - *See Structural Narrative.*
- **Electrical** (EBC Sections 308 and 808).
 - *See MEP Narrative.*
- **Mechanical** (EBC Sections 309 and 809).
 - *See MEP Narrative.*
- **Plumbing** (EBC Sections 310 and 810).
 - *See MEP Narrative.*
- **Fuel Gas** (EBC Sections 311 and 811)
 - Not applicable, no fuel gas work.
- **Elevators and Conveying Systems** (EBC Sections 312 and 812).
 - Not applicable, no elevator and conveying system work.
- **Energy Conservation** (EBC Sections 313 and 813).
 - **Minimum requirements** (EBC 813.1). Level 1 alterations are permitted without requiring the entire building to comply with the energy requirements of the NYC Energy Conservation Code. Case Study 1 shall conform to the energy requirements of ECC Chapter C5, Existing Buildings.
- **Interior Environment** (EBC Section 814)

- Not applicable.
- **Additional Safeguards During Construction or Demolition for Existing Buildings and Occupied Buildings (EBC Chapter 15).**
 - **Occupant protection** (EBC 1502.1). 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. Such protective means shall be indicated on an occupant protection plan.
 - **Common areas** (EBC 1502.2). Common areas that are open to the public shall be left clean and free from hazards at the end of the workday.
 - **Occupant Protection Plan** (EBC 1504). An Occupant Protection Plan in accordance with this section shall be prepared and provided.
 - **Maintenance of means of egress** (EBC 1505.1). Means of egress shall be maintained at all times during construction or demolition operations in occupied buildings.
 - **Sprinkler systems during alteration or demolition** (EBC 1506.1). Existing sprinkler systems in buildings undergoing alteration or demolition shall comply with the requirements of BC Section 3303.7.4 and EBC Section 1506.2. *See Fire Protection Narrative.*
 - **Sprinkler protection during construction in fully sprinklered buildings** (EBC 1506.2). Where alterations are proposed to a floor on which the sprinkler system is to be temporarily disconnected in the work area, Temporary Core Sprinkler Protection (TCSP) shall be provided in accordance with EBC 1506.2.1 through 1506.2.5 and the NYC Fire Code. *See Fire Protection Narrative.*