PART II

General

CHAPTER

4

Compliance Alternatives

Before providing an overview of the three compliance methods in the *International Existing Building Code* (IEBC), there are some general considerations as to when the IEBC is to be used and how it is applied. The IEBC is to be used only for buildings, or portions thereof, that have been previously occupied or used for their intended purpose. The reason for this is to avoid using the code for spaces that have not yet been occupied and should therefore be constructed in accordance with the *International Building Code* (IBC). Depending on the compliance option chosen, the requirements of the IEBC may be less restrictive than would be required by the IBC for new construction. **[Ref. 101.4]**

INTRODUCTION

A fundamental premise of the IEBC is that the building has been properly maintained and is in compliance with the *International Fire Code* (IFC) and the *International Property Maintenance Code* (IPMC). Both codes contain requirements for existing buildings that are used as a baseline from which the requirements of the IEBC are established. In other words, in order for the IEBC to be used, the building must be a legally existing building. If a building is not in compliance with the IFC or IPMC, the corrections needed to comply with those codes can be made without using the IEBC. **[Ref. 101.4.2 & 101.7]**

There were two fundamental concepts considered when New Jersey developed its version of a rehabilitation code. It was specifically discussed that an existing violation of the state fire code should not hold up a permit being issued under the rehabilitation code. The violation should be a separate citation and the corrective action should be separate from the work desired to be done by the owner. Clearly it may be economical to correct the fire code violation during the rehabilitation project and the fire code official could establish a compliance date consistent with the rehabilitation project, but they should be two separate enforcement activities. Second, if a fire code violation is discovered during the course of a rehabilitation project, again the fire code official may cite the owner for the violation but the enforcement is intended to be a separate action.

Structural considerations are treated in more detail in the IEBC because most jurisdictions do not have a code that addresses existing structural conditions like the IFC does for fire safety issues. Therefore, the IEBC does require more structural upgrades for various rehabilitation projects as compared to fire safety issues. For example, if one looks at Alterations—Level 1, there are no specific requirements for fire protection and means of egress other than maintaining current levels. However, there are additional provisions that address various structural items, including reroofing. **[Ref. 706]**

In addition to the compliance options about to be discussed, the owner and design professional have the option of complying with the IEBC in its entirety or the building code in existence at the time the building, or portion thereof, was originally built. Historically the rehabilitation codes that led to the development of the IEBC permitted the use of the building code in effect at the time of the project. This happened quite frequently in the early stages of the rehabilitation codes due in part to the fact that design professionals were more familiar and comfortable with the current building code.

You Should Know

When a shell building is built, the tenant fit-outs for spaces for which an occupancy permit has not yet been issued must be designed and constructed in accordance with the IBC. **[Ref. 101.4.1]** ●

You Should Know

If a building is cited for a means of egress deficiency based on a requirement in the IFC, the owner should correct the deficiency to comply with the IFC without applying the requirements of the IEBC. **[Ref. 101.7]** ●

You Should Know

In addition to the compliance options identified in the IEBC or the IBC, the building code in effect at the time the building was constructed may be used. **[Ref. 301.3, Ex]** ●

While permitted, using the building code in effect at the time of construction can be problematic with respect to determining what code was in effect. The documentation needed to determine the effective code may not be available from the building owner or the code official. While this approach sounds as if it may significantly reduce the requirements, note that the building must still comply with the current editions of the IFC and IPMC. As such, if the owner chose not to do anything, the building would be considered acceptable by the code officials. Any new work would not be permitted to make the building less compliant.

You Should Know

Appendix M in the IFC contains provisions for retroactive fire sprinkler protection for existing high-rise buildings and will apply if this appendix is specifically adopted in the adopting ordinance of the jurisdiction. ●

An example of how this might apply would be a rehabilitation project in an existing high-rise building. Let's assume that the building is not protected throughout with an approved fire sprinkler system and the building code in effect at the time the building was built provided both compartmentation and sprinkler options. If the owner did not want to install fire sprinklers in the building, as might be required by the Work Area Compliance Method, the building code in effect at the time of construction could be used. However, if the IFC as adopted by the jurisdiction requires sprinkler protection in existing high-rise buildings, by a separate action the sprinkler requirement should be enforced. If the adopted fire code of the jurisdiction does not require existing high-rise buildings to be equipped with fire sprinklers, then fire sprinkler protection may still be required at the discretion of the code official based upon the code in effect at the time. Under the IEBC, sprinkler protection may be required in the area where the rehabilitation work is to be performed, depending on the level of alteration and availability of municipal water supply at the high-rise building site.

One exception to using the building code in effect at the time of construction is the continued use of materials that are not permitted by the current building code. While like materials are permitted to be used for certain categories of work, the code does not permit an unsafe condition be created. For example, if ordinary glazing is used in a hazardous location in which safety glazing is required by the current building code, but is not required by the building code used at the time the building was constructed, any new glazing installed would be required to comply with the requirements in the building code in effect at the time the glazing is replaced. **[Ref. 302.3 & 302.4]**

The other exception to using the building code in effect at the time of construction is occupancy classifications and use of the space.

The building code in effect at the time of the rehabilitation project is to be used to determine occupancy and use classification. As the occupancy classifications have changed in newer editions of the IBC, and can certainly differ from the occupancy classifications of the legacy codes, this may impact the applicable code requirements.

One further option in the IEBC applies only to historic buildings. In addition to the various compliance options already discussed, the IEBC contains a specific chapter (Chapter 12) that applies to historic buildings. Chapter 12 permits some additional compliance options recognizing the need to maintain the historical aspects of the building as identified in the report required by Section 1201.2. While the project predates the current rehabilitation codes, this approach was utilized during a change of occupancy project associated with the courthouse in Colonial Williamsburg (Figure 4-1). The project included a change of occupancy to Group A-3 with an occupant load slightly more than 50 people along with some construction. Specific consideration and compensatory features were used to allow the building to have a single means of egress and to allow the doors to swing inward.

FIGURE 4-1 Colonial Williamsburg courthouse.

PROVISIONS FOR ALL COMPLIANCE METHODS

IEBC Chapter 3 contains provisions that apply to all compliance methods. This organization of topics in Chapter 3 is effective because it prevents repeating the same provisions in multiple chapters. An important point in this chapter is that once a compliance option for a project has been selected, that option will have to be used in its

You Should Know

Dangerous buildings are defined as any building, structure or portion thereof that meets any of the conditions described below:

1. The building or structure has collapsed, has partially collapsed, has moved off its foundation, or lacks the necessary support of the ground.
2. There exists a significant risk of collapse, detachment or dislodgement of any portion, member, appurtenance or ornamentation of the building or structure under service loads. **[Ref. 202]** ●

entirety. This means that of the three main compliance paths of Prescriptive, Work Area and Performance, the owner or designer will not be able to pick and choose various provisions from these paths and combine them to create their own option. Each of these compliance options works as a complete system and is not intended to be mixed with other paths. **[Ref. 301.3]**

Seven other important topics addressed in IEBC Chapter 3 are as follows:

General Provisions: This section covers referencing to other I-Codes, dangerous buildings, health care facilities and the use of existing materials. In cases where dangerous conditions exist, the code official always has the authority to demand remedy to eliminate the danger. The term "dangerous" is defined in Chapter 2. The IEBC in general allows continuing the use of existing materials or replacing existing materials with like materials unless an unsafe situation may be created. **[Ref. 302]**

Storm Shelters: The IEBC does not trigger storm shelters to be constructed within an existing building as part of a change of occupancy or alterations project. They are only required as part of a new addition to E occupancies. However, provisions have been included within the IEBC if storm shelters are voluntarily constructed within an existing building, and such storm shelters would need to comply with ICC 500. **[Ref. 303.1]**

Where an addition having an occupant load of 50 or more people is made to an existing education occupancy (Group E) located in an area where the shelter design wind speed for tornados is 250 mph or greater, the addition must have a storm shelter constructed in accordance with ICC 500, *Standard on the Design and Construction of Storm Shelters*®. However, there is an exception to the storm shelter requirement if the facility is a day care facility or is accessory to a place of religious worship. The storm shelter must be sized for either the aggregate occupant load of classrooms, vocational rooms and offices, or the occupant load of indoor assembly space, whichever is greater. Where existing storm shelters are already present on the property (Figure 4-2), the new storm shelter can be reduced in capacity when permitted by the local code official. However, there is an exception that if the addition itself is not capable of sheltering all occupants on the property, then the storm shelter only needs to be sized for the occupant load of the addition itself. **[Ref. 303.2.1]**

You Should Know

The IEBC includes the requirement for storm shelters to be consistent with the requirements of the IBC for new construction of educational facilities. ●

FIGURE 4-2 Storm shelter. *(Photo courtesy of Brian Stansberry)*

Structural Provisions: The evaluation of building structural conditions where there are additions or alterations is addressed regardless of the compliance option chosen. Gravity loads, snow drift loads on adjacent buildings, as a result of an addition or alteration and seismic evaluation of existing buildings, are generally independent of compliance options and are matters that must be addressed in general, hence these provisions are located in Chapter 3. Where specific projects trigger compliance with full seismic forces, reference is made to ASCE 7 and the ASCE 41 Tier 3 procedure identified in Table 304.3.1 (Table 4-1). Where reduced seismic forces are allowed, the conditions that must be complied with are identified, including the use of 75 percent of IBC-prescribed forces, using either IEBC Appendix A or ASCE 41 and Table 304.3.2 (Table 4-2). **[Ref. 304]**

TABLE 4-1 Performance Objectives for Use in ASCE 41 for Compliance with Full Seismic Forces

RISK CATEGORY (Based on IBC Table 1604.5)	STRUCTURAL PERFORMANCE LEVEL FOR USE WITH BSE-1N EARTHQUAKE HAZARD LEVEL	STRUCTURAL PERFORMANCE LEVEL FOR USE WITH BSE-2N EARTHQUAKE HAZARD LEVEL
I	Life Safety (S-3)	Collapse Prevention (S-5)
II	Life Safety (S-3)	Collapse Prevention (S-5)
III	Damage Control (S-2)	Limited Safety (S-4)
IV	Immediate Occupancy (S-1)	Life Safety (S-3)

[Ref. Table 304.3.1]

TABLE 4-2 Performance Objectives for Use in ASCE 41 for Compliance with Reduced Seismic Forces

RISK CATEGORY (Based on IBC Table 1604.5)	STRUCTURAL PERFORMANCE LEVEL FOR USE WITH BSE-1E EARTHQUAKE HAZARD LEVEL	STRUCTURAL PERFORMANCE LEVEL FOR USE WITH BSE-2E EARTHQUAKE HAZARD LEVEL
I	Life Safety (S-3). See Note a	Collapse Prevention (S-5)
II	Life Safety (S-3). See Note a	Collapse Prevention (S-5)
III	Damage Control (S-2). See Note a	Limited Safety (S-4). See Note b
IV	Immediate Occupancy (S-1)	Life Safety (S-3). See Note c
[Ref. Table 304.3.2]		

a. For Risk Categories I, II and III, the Tier 1 and Tier 2 procedures need not be considered for the BSE-1E earthquake hazard level.

b. For Risk Category III, the Tier 1 screening checklists shall be based on the Collapse Prevention, except that checklist statements using the Quick Check provisions shall be based on *MS*-factors that are the average of the values for Collapse Prevention and Life Safety.

c. For Risk Category IV, the Tier 1 screening checklists shall be based on Collapse Prevention, except that checklist statements using the Quick Check provisions shall be based on *MS*-factors for Life Safety.

Accessibility: The provisions for disabled access in various chapters and compliance options have been reorganized and placed in Section 305. Because the accessibility provisions are the same regardless of the type of alteration project, this reorganization simplifies the code and facilitates better application. In certain cases a situation might be created wherein applying the accessibility provisions of the IEBC might be considered beyond the level of access new buildings are required to provide. It is not the intent of the IEBC to require an existing building to provide more accessibility than is required of new buildings. At the same time, alteration or addition projects are not intended to reduce the current level of accessibility in the existing building. Technical infeasibility is also very important in existing buildings and exceptions for compliance with full accessibility are made available for cases where building structural elements might be impacted. The case of additions is straightforward: addition is new building and must comply with accessibility requirements for new buildings. If an addition is an area of primary function, then the route to the primary function area in the existing building must be accessible. When an alteration affects an area of primary function, an accessible route to an area of primary function must be created. The exception to this requirement is when an alteration is minor in nature (such as work on windows, hardware, electrical outlets or dealing with mechanical, electrical and fire protection systems) or when exceptions to full accessibility are allowed; for example, where excessive cost is a concern or an alteration is undertaken solely to improve accessibility. **[Ref. 306.3, 306.5, 306.7]**

For a change of occupancy, the code identifies specific levels of accessibility, such as accessible entrances, accessible means of egress,

signage, parking and other elements, while requiring the maximum possible compliance. [Ref. 306.4]

Compliance levels in alterations are also addressed for specific elements of buildings such as entrances, elevators, stairways, ramps, toilet rooms and other elements and areas. [Ref. 306.7.16]

Entrances: Where a project includes alterations to an entrance, that entrance must be made accessible if the building has no other accessible entrance, and it does not have to be made accessible if there is another accessible entrance. If the altered entrance is related to an area of primary function, it must be made accessible.

Elevators: Altered elements of existing buildings are required to comply with accessibility standards ASME A17.1 and ICC A117.1.

Stairways and Escalators: Where two levels of a building are connected with a new stairway or escalator, an accessible route must be provided between these two levels.

Ramps: Ramps must comply with maximum slope requirements of the IBC; however, if space limitations do not allow compliance, then steeper slopes can be used in accordance with Table 305.8.5 (Table 4-3).

TABLE 4-3 Ramps

SLOPE	MAXIMUM RISE
Steeper than 1:10 but not steeper than 1:8	3 inches
Steeper than 1:12 but not steeper than 1:10	6 inches
[Ref. Table 305.8.5]	

Toilet Rooms: Where existing toilet rooms are required to be made accessible, but it is technically infeasible to do so, an accessible family or assisted-use toilet is permitted, located on the same floor and in the same area as the existing toilet rooms.

Historic Buildings: Historic buildings are covered in Chapter 12; however, certain limited provisions are also included in Chapter 3. [Ref. 306.7.16]

Smoke Alarms: Individual sleeping units and individual dwelling units in any Level 2 Alterations work areas in residential (Group R) or large residential care/assisted living facilities (Group I-1) must be provided with smoke alarms per the IFC. Interconnection of smoke alarms in the living units is still required, but other smoke alarms outside of the work areas can continue to operate as they previously did and do not require interconnection. [Ref. 307.1]

FIGURE 4-3 Combined smoke and CO detector in room.

FIGURE 4-4 Grenfell Tower Fire, North Kensington, West London.

Carbon Monoxide Detection: Carbon monoxide (CO) is a colorless, tasteless and odorless gas that is produced as part of fuel combustion. In small concentrations, CO can cause headaches, confusion and dizziness. In higher concentrations, CO can cause loss of consciousness and potential death. Concentrations greater than 100 parts per million are dangerous to living creatures. Carbon monoxide alarms must be installed in Level 2 Alterations work areas in institutional health care, residential and educational facilities where required by the IFC for existing Group I-1, I-2, R occupancies and classrooms of E occupancies (Figure 4-3). It should be noted that the IFC has retroactive provisions, specifically Section 1103.9, and if the jurisdiction enforces those provisions, the entire occupancy is to be provided with CO alarms if no such system is present, not just the work areas. **[Ref. 308.1]**

Additions and Replacements of Exterior Wall Coverings and Exterior Wall Envelopes: Materials used for the construction of exterior walls, specifically exterior cladding and insulating materials, have contributed to the rapid spread of fire particularly in high-rise buildings (Figure 4-4). When an exterior wall covering or exterior wall envelope is added or replaced as part of an alteration, addition, repair, relocation of structures or changes of occupancy, regardless of which specific compliance method has been chosen, the materials and methods being used are required to comply with Chapters 14 and 26, respectively, of the *International Building Code* (IBC). Further, these requirements are triggered when the exterior wall covering, or exterior wall envelope, being replaced or added involves two or more contiguous stories and exceeds more than 15 percent of the total wall area on any one side of the building. **[Ref. 309]**

COMPLIANCE ALTERNATIVES

In addition to the provisions discussed previously, the code provides three main options for dealing with alterations of existing buildings. Each of these options will be explained in greater detail later in the book. The three options presented in Section 301 are as follows:

OPTION 1: Work for alteration, repair, change of occupancy, addition or relocation of all existing buildings shall be done in accordance with the Prescriptive Compliance Method given in Chapter 5.