

THE CODE CORNER

Existing Buildings

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If you thought designing a new building to comply with the building code was a difficult task, try applying the building code to an existing building. In many cases, it is impossible, either financially or physically, to bring an existing building into full compliance with the current, adopted building code.

In the past, building codes have included provisions to address the unique situations presented by altering, repairing, or adding to existing structures. However, the content of these provisions was very minimal. For example, the 1997 *Uniform Building Code* had only 2 pages devoted to existing structures. When the *International Building Code* was published for the first time in 2000, the chapter on existing structures expanded significantly to 14 pages.

By the time the International Code Council was ready to publish their second edition (2003) of the International Codes, the family of codes grew by one to include the *International Existing Building Code*, or IEBC. This new member of the International Codes took a dramatic leap by adding 67 pages of provisions, with an additional 214 pages of appendices and resource materials--a one-stop-shop for existing building code compliance. The IBC still has a chapter on existing structures (Chapter 34), but all of its content is based on selected provisions in the IEBC.

Application

The question of whether to use the IEBC or not on a project is actually left to the designer. In Section 101.2 of the 2003 IBC, there is an exception that states the IEBC is permitted to be used by buildings undergoing repair, alterations, and additions. The newest edition of the IBC (2006) does not have this exception. However, the intent stated in the 2006 IEBC underscores the option of applying either code for existing buildings:

101.3 Intent. The intent of this code is to provide flexibility to permit the use of alternative approaches to achieve compliance with minimum requirements to safeguard the public health, safety and welfare insofar as they are affected by the repair, alteration, change of occupancy, addition and relocation of existing buildings.

Obviously, building officials would like to see buildings comply with the current building code, such as the IBC, but older buildings, especially historic buildings, have unique conditions that make it literally impossible to fully comply with the building code. Therefore, this built-in flexibility provides the designer with a few options to achieve a safe project.

IEBC Format

The IEBC has a unique format which is unlike the normal building code. Instead of chapters that provide provisions for various areas of building regulation, the chapter structure in the IEBC is based primarily on the classification of proposed changes to the existing building, which are outlined in Chapter 3. The classification types include repairs, alteration, change of occupancy, additions, historic buildings, and relocated buildings.

Each classification type is assigned its own chapter, with the exception of alterations, which has three chapters based on the level of alteration work. Within each chapter, the sections follow a consistent structure that typically address specific areas on fire and life safety, accessibility, materials, structural design, and building systems (mechanical, electrical, and plumbing).

Classification of Work

To utilize the IEBC properly, you should start in Chapter 3, entitled "Classification of Work." The use of the building is classified in accordance with Chapter 3 of the IBC, which will assist the designer in identifying the occupancy group or groups. In the next step, the designer determines which of the six sections of the IEBC will

apply to the building under consideration. Under some conditions, more than one classification may apply. The six sections include the following:

1) Repairs - By definition, a “repair” according to the IEBC, is the “restoration to good or sound condition of any part of an existing building for the purpose of its maintenance.” Essentially, if the work only “fixes” what was previously there, then it is classified as “repair” work. However, new materials must comply with the requirements for new construction, including safety glazing where required and materials that do not contain hazardous components (i.e. lead and asbestos). Structural damage, whether minor or substantial, will also be required to comply with the provisions for new construction.

2) Alterations - As previously mentioned there are three chapters applicable to alteration work. Each one applies to a degree of alteration work with Level 1 alterations involving new construction that is the least intrusive on existing construction and Level 3 being the most intrusive.

- A Level 1 alteration is similar to a repair except that newer materials, elements, equipment or fixtures are installed that provide the same purpose of the previous items.
- A Level 2 alteration includes the reconfiguration of space, the addition or elimination of doors or windows, extension of any system, or the installation of any equipment. Level 2 alterations must comply with the requirements for Level 1 alterations, as well.
- A Level 3 alteration is where the work area exceeds 50% of the total building area. The work area, by IEBC definition, includes all reconfigured spaces. Additionally, Level 3 alterations must comply with the requirements for Levels 1 and 2.

3) Change of Occupancy - This section will apply when the new occupancy of an existing building is different from the previously approved occupancy. For example, if a former grocery store (Group M Mercantile) is converted into an office complex (Group B Business), then the requirements of this section would apply. It is important to note that in some situations the building will need to comply fully with the IBC if one of the special uses or occupancies listed applies to the project. These include, in part, covered malls, atriums, motor vehicle and aircraft occupancies, and stages and platforms.

4) Additions - This is fairly self-explanatory, but if the building is increased either in area, number of stories, or in height, then it’s considered an addition.

5) Historic Buildings - This section includes buildings that are listed in either a state or national register of historic places, designated by local or state agencies as historic, certified as a contributing resource within a historic district, or are determined to be eligible for any type of official historic designation.

6) Relocated Buildings - Another self-explanatory classification. If a building is moved from one site to another, regardless of distance, it must comply with this section, which generally pertains to the structural needs of the building. If the building is modified either by repair, alteration, addition, or change of use, then the applicable requirements in those sections will apply to the building in addition to the requirements in this chapter.

Compliance Alternatives

Another option available to the designer is IEBC Chapter 12, “Compliance Alternatives,” which is also available in IBC Chapter 34 for those projects not utilizing the IEBC. The provisions for compliance alternatives allow a building to be evaluated on 19 areas pertaining to three categories: fire safety, means of egress, and general safety. Each area is assigned a value based on the characteristics of the existing building. The values are determined either by calculation, from one of the several tables, or by a combination of both. In order to properly apply this section, a thorough analysis of the building will be necessary. This may include a review of original construction drawings (if available) and a physical inspection of the building.

The values are then applied to one or more of the three categories. The values within each category are totaled, and if the sum, or score, is equal to or greater than the calculated, mandatory value for each category, then the

building passes. However, if the value falls short of the mandatory value, then improvements to the building will need to be made in order to improve the score.

According to the language in the IEBC, this chapter should only be applicable to buildings that were built before a certain date. It is up to the local jurisdiction adopting the IEBC to determine what the cut-off date is, but the ICC recommends the date used should coincide with the date building codes were introduced to the jurisdiction. Additionally, the use of this chapter excludes H and I occupancies; they must either comply with the other chapters of the IEBC or comply with the IBC.

Appendices and Resources

The IEBC includes two appendices and one resource. The first appendix, Appendix A, is subdivided into 4 smaller appendices which can be adopted individually. Appendix A is for the seismic retrofit of unreinforced masonry buildings, reinforced masonry buildings, wood-frame residential buildings, and concrete and masonry infill buildings.

Appendix B covers supplementary accessibility requirements for historic buildings and facilities, fixed transportation facilities and stations, and dwelling and sleeping units. The application of this appendix is dependent upon specific adoption by the local jurisdiction, as well.

Resource A in the IEBC is a copy of the National Institutes of Building Sciences (NIBS) *Guideline on Fire Ratings of Archaic Materials and Assemblies*, first published in 1980. Since it is not a document that can be specifically adopted by the jurisdiction, it therefore holds the status of a resource. Since many materials used in older buildings either no longer exist or have been replaced by improved products, their fire-resistance capabilities are no longer made available by the manufacturers or testing labs. This resource provides designers with the means of determining fire-resistance ratings of existing construction when evaluating a building for compliance with current code requirements.

Bottom Line: Do Not Reduce Safety

Existing buildings provide unique challenges that typically are not encountered in new construction. Older buildings, even if constructed in full compliance with the building code adopted at the time of construction, are often lacking modern life safety features that have improved over time as building codes change through the code development process. It would be unreasonable to have building owners modify their buildings each time the building code is changed, so existing buildings are exempt under standard “grandfather” clauses.

However, once an owner decides to modify a building, then the current building code becomes very much applicable. But to the relief of many owners, full compliance with the building code is not necessary, so understanding what is required and what is not will minimize the impact on the owner’s budget. The bottom line to code regulation for existing buildings is to not make them less safe than their current condition.

To comment on this article, suggest other topics, or submit a question regarding codes, contact the author at ron@specsandcodes.com.

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