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PERSPECTIVES

International Existing Building Code (IEBC): Demystifying Proper Application of the Code

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INTRODUCTION

When a damaged structure is being returned to service, confusion sometimes surrounds the question of which building codes to apply—the International Building Code (IBC), International Existing Building Code (IEBC), or the International Residential Code (IRC)? What can also be difficult is discerning how they were intended to be applied to correct damage, something that is commonly misunderstood by building department staff and design professionals alike. The misapplication of code is commonly explained away with assertions such as, "That is what the Building Department told me," or, "That is what the Design Professionals' drawings said," which is a disservice to all parties involved.

The purpose of this paper is to clear up the misunderstandings or misconceptions one may encounter when dealing with a damaged building. This paper is intended as a general overview, is not comprehensive in nature, and readers are encouraged to contact J.S. Held's Forensic Architecture & Engineering group regarding specific questions and situations.

THE CODES

This paper will focus on three of the most commonly refenced model codes as written and developed by the International Code Council (ICC):

- International Building Code (IBC)
- International Residential Code (IRC)
- International Existing Building Code (IEBC)

The IBC

This code is for all new work and not for detached or attached one- and two-family dwellings. The scope of the work ranges from an interior ADA brail sign to an entire building of unlimited area. The scoping for this document can be found in Chapter 1 of the IBC.

The IRC

This is an all-inclusive document intended only to apply to detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories in height with separate entries. The ICC's intent for this document is to provide a means for homeowners or contractors to repair, modify, extend, or build an entirely new residential structure without the need for a design professional.

The IEBC

This is a scoping document for existing buildings and not for detached or attached one- and two-family dwellings. The intent of the document is to encourage the continued use and rehabilitation of existing buildings, and it is formatted in a such a way as to focus on incremental upgrades depending on the intent of the work and the extent of such work. This document acknowledges that older building stock has the potential for unique and not easily modifiable characteristics. So, as it concerns older buildings, one is to define the scope of the work and see what is required by the IEBC using this document. From there, one would refer to the IBC or applicable I-code volume, comply with the requirements for that element, then refer again to the IEBC for the next item.

This may seem clear enough, but problems may arise when one considers the scoping passage from the 2015 IBC, below (Note that we will reference the 2015 editions of the I-codes throughout this paper).

> ***§101.2 Scope.*** *The provisions of this code shall apply to the construction, alteration, relocation, enlargement, replacement, repair, equipment, use and occupancy, location, maintenance, removal and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures.*

> ***Exception:*** *Detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories above grade plane in height with a separate means of egress, and their accessory structures not more than three stories above grade plane in height, shall comply with the International Residential Code*

Confusing? It sounds like a catch-all, and that is the intent of this phrase from the IBC; the exception states this code is not for detached or attached one- and two-family dwellings. One is to use the IRC in these cases. The same scoping passage from the IEBC reads like this:

> ***§ 101.2 Scope.*** *The provisions of the International Existing Building Code shall apply to the repair, alteration, change of occupancy, addition to and relocation of existing buildings*

Again, the intent of the IEBC is to be a scoping document to lay out a "road map" of code to address the work and what needs to be done to ensure the health, safety, and welfare of the occupants and general public as defined in **§ 101.3 Intent.**

Another important colloquial term used is the concept of "grandfathering," a term formally defined in the following passage:

> ***§ 101.4.2 Buildings previously occupied.*** *The legal occupancy of any building existing on the date of adoption of this code shall be permitted to continue without change, except as is specifically covered in this code, the International Fire Code, or the International Property Maintenance Code, or as is deemed necessary by the code official for the general safety and welfare of the occupants and the public.*

This statement acknowledges that existing, legally permitted and occupied structures can remain as they are with no need to modify them when new codes are adopted. However, there are two maintenance codes that apply to existing buildings:

- The International Fire Code (IFC) or the Authority Having Jurisdiction (AHJ) adopted fire code.
- International Property Maintenance Code (IPMC) or the AHJ adopted building / housing maintenance code.

The IFC is utilized by the fire department to prevent hazardous or life threatening conditions and is focused on building use, contents, fire protection, protection of first responders, and means of egress for occupants to safely evacuate a structure in a time of panic. The IPMC is used by the building department to ensure the health, safety, and welfare of the occupants and the general public. It also focuses on the continued maintenance of all general aspects of an existing structure to also promote health, safety, and welfare for the building occupants as well as the protection of the general public from nuisance and dilapidated structures / properties.

When doing work on existing buildings, one is strongly encouraged to see what codes the AHJ has adopted at either the state or local level, depending on the applicable governmental system in effect, in order to best determine what compliance methods are available for building related matters.

INTENT AND USE

Chapter 2 – Definitions

When using any of the above mentioned I-codes to repair an existing damaged structure, the scope and administration (Chapter 1) is the place to start as it concerns determining the scope, intent, and whether the application of other referenced codes is appropriate.

The definitions in Chapter 2 (italicized and bolded below and throughout the rest of this paper) are critical, as specific word usage applies to terms and concepts throughout the document. For instance, let's look at different types of work within an existing building that are defined in the IEBC:

> ***ADDITION.*** *An extension or increase in floor area or height of a building or structure.*
>
> ***ALTERATION.*** Any construction or renovation to an existing structure other than repair or addition.
>
> ***CHANGE OF OCCUPANCY.*** *A change in the use of the building or a portion of a building. A change of occupancy shall include any change of occupancy classification, any change from one group to another group within an occupancy classification or any change in use within a group for a specific occupancy classification.*
>
> ***REHABILITATION.*** *Any work, as described by the categories of work defined herein, undertaken in an existing building.*
>
> ***REPAIR.*** *The reconstruction or renewal of any part of an existing building for the purpose of its maintenance or to correct damage.*

Additional terms also worth noting:

> ***WORK AREA.*** *That portion or portions of a building consisting of all reconfigured spaces as indicated on the construction documents. Work area excludes other portions of the building where incidental work entailed by the intended work must be performed and portions of the building where work not initially intended by the owner is specifically required by this code.*
>
> ***EXISTING BUILDING.*** *A building erected prior to the date of adoption of the appropriate code, or one for which a legal building permit has been issued.*
>
> ***HISTORIC BUILDING.*** *Any building or structure that is one or more of the following:*
>
> *1. Listed, or certified as eligible for listing, by the State Historic Preservation Officer or the Keeper of the National Register of Historic Places, in the National Register of Historic Places.*
>
> *2. Designated as historic under an applicable state or local law.*
>
> *3. Certified as a contributing resource within a National Register, state designated or locally designated historic district.*

From the list of defined words, one is to compare the specifically defined word to the intent and the scope of work. So, if we are repairing an existing building that suffered fire damage the defined term, **Repair**, includes "*…to correct damage…*" as part of its definition. An important note regarding repairs is the assumption that the cause for the repair was not a willful act but an unforeseen event that has caused a level of damage that needs to be corrected in order to return the structure to service. Notice under the defined term there is no limit or threshold to the amount or level of damage, just the provision that the damage has happened and is to be corrected.

Also note that the defined term, **Alteration**, is often erroneously used to classify work on an existing structure to correct damage. Per the defined term, work related to repairs is excluded, and an alteration is "any construction or renovation to an existing structure other than repair or addition." A possible reason for the misunderstanding or improper application of this term can be found in section 503.1 of the IEBC, where it is stated:

> ***§ 503.1 Scope. Level 1 Alterations*** *include the removal and replacement of the coverings of existing materials, elements, equipment, or fixtures using new materials, elements, equipment or fixtures that serve the same purpose.*

Initially, upon reading the above section, one may believe that the terms **Repair** and **Level 1 Alteration** are interchangeable or duplicative, and that a repair does involve the removal and replacement of existing elements, systems, and/or coverings with new ones to serve the same purpose. However, all alterations are willful, elective acts where the building owner chooses to replace finishes, move walls, add or delete systems, etc., in an existing building. The authors of the IEBC understand that at these points, since there is elective work being done, it is a good time to require potential upgrades to the buildings (materials, structural, fire protection, egress, accessibility, mechanical, electrical, or plumbing systems) depending the extent of elective work.

Chapter 3 – Compliance Paths

The next stop is Chapter 3: Provisions for all Compliance Methods. As within the IEBC, we are provided five possible code compliance paths, listed from most restrictive and complicated to least:

1. Utilizing the IBC for all portions of work and work areas

2. Utilizing a previously adopted code under which the area in question was most recently built or modified; this requires the code official's approval.

3. Utilizing the IEBC performance compliance option (Chapter 14).
4. Utilizing the IEBC prescriptive compliance option (Chapter 4).

5. Utilizing the IEBC work area compliance option (Chapters 5 through 13).

Additionally, there are options for designated historic landmark structures, but note that an ordinary old building does not qualify for this option—the building has to be a specifically listed and designated structure on either the local, state, or national historic register. There are also different levels of designation, and one should contact the local or state preservation office for more details, as compliance is typically related to preserving the designation or historic tax credits utilized for redevelopment.

Further, in Chapter 3 the presence of existing materials is mentioned along with new and replacement materials. The existing occupancy and use of the building/spaces shall be done in accordance with IBC. Additional codes are referenced in **§ 302.2 Additional codes**, and where there are conflicts between the referenced code and the IEBC, the IEBC shall take precedence.

CODE CONSIDERATIONS

Due to the reissuance of the I-code family every three years and the AHJ's code adoption cycle, codes do change month-to-month or year-to-year. This is why it is critical to verify with the AHJ what codes are in effect at the time any initial damage occurs, while also being mindful of any future adoptions of changes. It is important to understand that specific code application (year/version), from a building department perspective, is typically based on when a permit is obtained. From an insurance coverage perspective, it is often based on the code in effect at the time of the loss. This determination can be clarified by review, on a case-by-case basis, with law and ordinance upgrades that may be included as part of the coverage.

Below is a summary of the typical scoping one would encounter in the IEBC when one is repairing an existing building in order to return it to service:

2015 IEBC Chapter 6 - Repair - Scope

- ***Conformance*** *– Work shall not make the building less compliant to the code than the building was prior to the loss, per section 601.2.*
- ***Hazardous Glazing*** *– Replacement of glazing in hazardous location shall comply with the requirements of the IBC, per section 602.3.*
- ***Fire Protection*** *– Repairs shall maintain the level provided prior to the loss, per section 603.1.*
- ***Means of Egress*** *– Repairs shall maintain the level provided prior to the loss, per section 604.1.*
- ***Accessibility*** *– Repairs shall maintain the level provided prior to the loss, per section 605.1.*
- ***Structural*** *– For less than substantial structural the elements shall be permitted to be restored to their pre-damage condition, per section 606.2.1.*

Definition - ***SUBSTANTIAL STRUCTURAL DAMAGE****. A condition where one or both of the following apply:*

1. *In any story, the vertical elements of the lateral force-resisting system have suffered damage such that the lateral load carrying capacity of the structure in any horizontal direction has been reduced by more than 33 percent from its pre-damage condition; or*
2. *The capacity of any vertical component carrying gravity load component, or any group of such components, that supports more than 30 percent of the total area of the structure's floor(s) and roof(s) has been reduced more than 20 percent from its pre-damage condition and the remaining capacity of such affected elements, with respect to all dead and live loads, is less than 75 percent of that required by this code for new buildings of similar structure, purpose and location.*

Note that in the 2018 version of the IEBC a third part of the defined condition is added:

> 3. *The capacity of any structural component carrying snow load, or any group of such components, that supports more than 30 percent of the roof area of similar construction has been reduced more than 20 percent from its pre-damage condition, and the remaining capacity with respect to dead, live and snow loads is less than 75 percent of that required by the International Building Code for new buildings of similar structure, purpose and location.*

Additionally, regardless of the extent of structural or nonstructural damage, dangerous conditions are to be eliminated. New structural members and connections used shall comply with the detailing provisions of the IBC for new buildings of similar purpose and location, per section 606.1.

- ***Electrical*** *– Existing electrical wiring and equipment undergoing repair shall be allowed to be replace with like material. The following additional sub-sections apply; § 607.1.1 Receptacles, § 607.1.2 Plug fuses, § 607.1.3 Non-grounding type receptacles, § 607.1.5 Grounding of appliances, per section 607.1*

- ***Mechanical*** *– Existing systems undergoing repair shall not make the building less conforming then prior to the repair, per section 608.1. And a mechanical draft system shall be permitted for appliances and fireplaces when the device is installed per the manufactures instructions and has audible warning devices if the equipment fails to operate, along with the installation of a smoke detector in the room with the appliance, per section 608.2.*

- ***Plumbing*** *– Materials prohibited in the International Plumbing Code shall not be used, per section 609.1*

  a. 609.2 Water Closet Replacement. The maximum water consumption flow rates and quantitates for all replaced water closets shall be 1.6 gallons per flushing cycle.

Additionally, per § 502.3 Related work, acknowledges the potential need to perform related work in other portions of the building where damage did not occur in order to complete the repair; as such, this work shall be classified as part of the repair.

Therefore, per the IEBC, when work is classified as a ***Repair*** to correct damage as a result of a loss either direct or indirect:

- Existing materials in use can remain, and new materials are permitted as allowed by the IBC or IEBC; furthermore, the use of hazardous materials is prohibited.
- The portions of the building being repaired must be constructed under the applicable code for new construction.
- The materials already in use, which are unaffected by the repair, can remain in place as-is.
- The structure will need to be repaired in compliance with the requirements of the current adopted building codes.
- All existing fire protection, means of egress, mechanical, and accessibility can remain as-is (their state prior to the loss).
- All materials used to make repairs to the existing plumbing system must comply with the IPC.
- The damage to the existing structural gravity load carrying system if less than substantial structural damage and can be repaired with similar members that are detailed in accordance with the IBC.
- All repairs to the existing electrical system must comply with Section 607 of the IEBC.
- The replacement of fire-damaged components must comply with the requirements of the IBC.
- The replacement of all directly fire-damaged wiring and components must comply with the requirements of the NEC.

CONCLUSION

With a repair there is no willful choice—a repair is performed to correct the damage resulting from an unplanned event in order to return the structure to service. Alterations, in contrast, are planned and/or elective in nature.

The IEBC is a scoping document/road map for the type of work occurring on existing buildings. The IBC, however, determines how new work for specifically directed elements should be done once one complies with the IBC requirements for those elements. Finally, the I-codes are linear documents and should be utilized accordingly, lest misinterpretations or misapplication of the code result in over-scoping of the code or application errors.

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MORE ABOUT J.S. HELD'S CONTRIBUTORS

Michael Rimoldi is a Senior Project Manager in J.S. Held's Forensic Architecture and Engineering Practice. In addition to applying and interpreting the building codes, Michael is a licensed building contractor who has worked on both residential and commercial projects of various scopes. He is an ASFPM Certified Floodplain Manager and a credited reviewer of several FEMA construction-related documents including the Coastal Construction Manual, the Local Officials Guide to Coastal Construction and Natural Hazards and Sustainability for Residential Buildings. He has appeared on several national media outlets discussing building codes and construction including CNN, Good Morning America, and The Weather Channel.

Mike can be reached at mrimoldi@jsheld.com or +1 813 676 1050.

Erik Fritzberg is a Professional Architect in J.S. Held's Forensic Architecture and Engineering Practice and a professional mitigation, construction, and building code expert specializing in application of code required upgrades as they apply to existing buildings. Erik also assists with all aspect of building shell and assembly design and specification. Erik's experience with numerous institutional, commercial, educational, industrial, and residential projects of various construction types and complexities, both new and existing, provides him with a broad range of expertise to assist owners and clients.

Erik can be reached at efritzberg@jsheld.com or +1 412 293 3756.

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