

International Building Code

Seismic Compliance for Healthcare and Critical Facilities

ClimateCraft continues to lead the industry in providing customers with equipment that satisfies the statutory requirements for compliance with the earthquake provisions of the International Building Code. By undergoing the rigorous and independent analysis required for custom air handling equipment, many of its numerous configurations have received certification of compliance and are operating in healthcare and other critical facilities nationwide. In addition, having received Special Seismic Certification Pre-Approval (OSP) from the California Office of Statewide Health Planning and Development (OSHPD), it can now satisfy the special requirements for healthcare facilities in that state.

What Is The International Building Code?

The International Building Code (IBC) is one of 14 International Codes developed by the International Code Council (ICC) as part of a unified set of U.S. model codes. The IBC is the building structural code. Because it is the structural code, it historically is not a document reviewed by the MEP professional, however, the ICC has changed this dynamic by including key requirements for mechanical and electrical equipment within the IBC. Individual states may also have additional compliance requirements that must be considered, such as those of the California Office of Statewide Health Planning and Development, a state agency that approves all healthcare construction in the state.

What is the Status of Code Adoption?

Since its initial publication in 2000, the IBC has been adopted in some form by all 50 states, the District of Columbia, the U.S. Department of Defense and other governing agencies. Even though it is a statutory requirement in all 50 states, understanding within the building and building design communities of its impacts on mechanical and electrical systems is generally inconsistent, often due to insufficient communication from the state regulatory agencies. This lack of understanding can pose unwelcome liability issues and even place building occupancy at risk. A working knowledge of the IBC and federal, state and local regulations related to it is now mandatory.

What Is Meant By Compliance?

A key requirement outlined in the IBC is resistance to seismic forces for both structural and critical non-structural building components, such as HVAC systems. Within the IBC, Section 1621, "Architectural, Mechanical and Electrical Seismic Design Requirements" and Chapter 17, "Structural Tests and Special Inspections" present the specific design criteria. These chapters, in conjunction with the American Society of Civil Engineers Standard 7 (ASCE 7), are used for determining compliance, severity, test and certification requirements, inspections, etc. for use by the design professional of record. In the code, the responsibility for identifying critical non-structural components, such as a custom air handler, that must stay on line and functional after a seismic event, has been given to the design professional of record. Once a

component has been identified as critical and non-exempt, the component must be independently certified and labeled as able to withstand a site specific Seismic Design Force, stated in terms of a G force requirement, and to stay online and functional. In the case of California healthcare construction, the component must also be approved by the Office of Statewide Health Planning & Development (OSHPD).

When Must A Custom Air Handler Be Certified As Compliant?

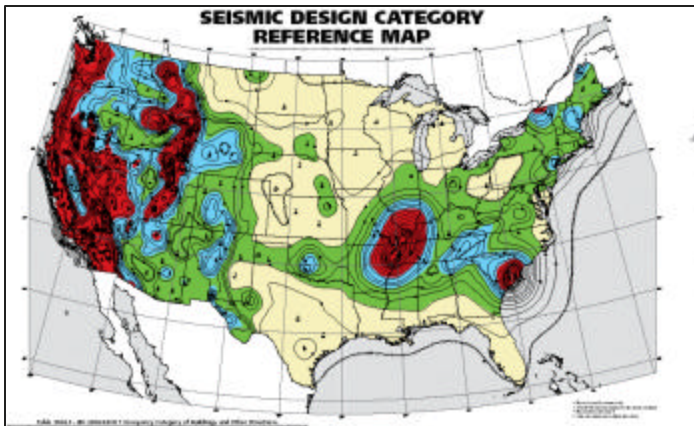
The IBC outlines basic steps for the design professional to follow in determining the requirements for certified seismic compliance. These include determining general site conditions, the building's Occupancy Category and the component's Component Importance Factor. These are then used to determine the building's Seismic Design Category and the equipment's requirement for compliance.

- **General Site Conditions**– A calculation combining the site's seismic potential, as determined by the USGS, and the site's soil conditions. This information is available in the structural engineer's notes for the building, typically page S1.
- **Occupancy Category**– A function of the building's use. For example, a key category is structures designated as essential facilities, such as emergency shelters and hospitals with emergency treatment facilities.
- **Component Importance Factor**– A function of the component's importance in regard to maintaining life safety or allowing the facility to fulfill its intended function.
- **Seismic Design Category**– A determination based on the building's site conditions and its occupancy category. It is used in conjunction with the component's importance factor in determination if the component is exempt from compliance requirements.
- **Compliance**– If the component has been found not to be exempt, it must have a suitable Certificate of Compliance and unit label provided by an independent third party certifying it as compliant to the calculated Seismic force the component must be able to resist.
- **Seismic Force**– Calculated value based on site conditions, equipment mounting method, location in building, etc.

What is the Impact on Healthcare?

The most common facility category facing seismic design requirements is hospitals, especially those providing surgery or emergency treatment. Critical equipment in such facilities located in the areas identified on the map (page 2) as blue, green or red are subject to IBC seismic compliance requirements.

The VMC Group, a prominent certified national seismic qualification agent, combined the compliance factors described previously into the following map that provides building professionals a quick reference guide in identifying regional areas where seismic design requirements comes into play.



How is Compliance Identified?

It is critical that the building professional not only be aware of the requirements of the IBC, but also to be aware of sources of compliant equipment at time of document preparation. Waiting until after bid documents are prepared, or relying on assurances of anticipated compliance by equipment ship date, can cause serious delays in the construction schedule and possibly even costlier delays in building occupancy. In order to be confident that their project will go ahead as planned, architects, engineers, and owners must know at the very start of the design process that their project will comply.

- **Certificate of Compliance**— A document issued by the equipment manufacturer that outlines the scope of compliance in terms of product capability, seismic severity and installation, and shows the name of the Seismic Qualification Agency. This should be required as part of supplier prequalification for any project.
- **Listing by an ICC Accredited Listing Agent**— An ICC accredited agent has successfully completed a rigorous qualification process that goes beyond evaluating just the technical aspects of compliance but also into evaluating a manufacturer's quality and process controls. Proof of listing by an ICC Accredited Listing Agent should be considered as part of supplier prequalification.
- **Special local, state or federal requirements**— Understanding of additional local approval requirements is critical. For example, the State of California places special emphasis on seismic capabilities and all healthcare construction must be approved by the California Office of Statewide Health Planning and Development (OSHPD). Once approved, OSHPD issues the manufacturer a Special Seismic Certification Pre-Approval (OSP) and posts the pertinent information on their website.

Does the IBC Also Affect Renovation?

The only correct answer is "It can." It is the responsibility of the engineer of record to determine from the project's structural drawings if the structure is required to be updated to current Code standards. If the answer is yes, critical non-structural elements, such as an air handling system, will also have to comply with the code.



"Air handlers are a major non-structural element, providing safety and other essential functions"

Where Can I Turn for Compliant Equipment?

ClimateCraft can provide owners of healthcare, and other critical use facilities with custom air handling equipment certified compliant to the seismic requirements of the IBC, today. Following completion of rigorous structural analysis and shake table test regimens, ClimateCraft has received a Certificate of Compliance from The VMC Group, a certified Seismic Qualification Agent, with their listing by Seismic Source, an International Code Council (ICC) Accredited Listing Agent and an OSHPD Special Seismic Certification Pre Approval for California healthcare projects. These approvals give the design professional confidence from the very beginning of the design process that the specified equipment will be available with the required compliance documents, and give state approval authorities, such as California's OSHPD, the assurance that submitted equipment complies with state statutes.



Further Information

For help in determining your seismic compliance requirements, or for more information on ClimateCraft compliant products contact your local ClimateCraft sales representative. For representative contact information, please visit www.ClimateCraft.com