
THE VMC GROUP

IBC SEISMIC AND WIND LOAD COMPLIANCE FOR NON-STRUCTURAL COMPONENTS

Requirements for
Occupancy Category IV, IBC 2003, 2006 & 2009

Chip Morrow
Director of Sales
The VMC Group

BACKGROUND

WHY ARE WE HERE?

- To acquaint you with the seismic/wind load “on line” requirements of the International Building Code (IBC)
- To teach you how to help minimize your exposure to risk and liability

CUSTOMERS

OEM CERTIFICATIONS

Scott Springfield

THE VMC GROUP

Aeroflex International Isolators | Amber/Booth | Korfund Dynamics | Vibration Mountings & Controls

BACKGROUND

WHAT IS THE IBC CODE?

- International Building Code (IBC) is a publication developed by the International Code Council (ICC)
- ICC was assembled to develop a single set of national model construction codes
- IBC publications are funded and supported by NEHRP (National Science Foundation, National Institute and Standards of Technology, FEMA and USGS)
- Code specifically addresses design and installation of building systems with emphasis on performance
- Until now, only anchorage of a unit to the structure was considered – equipment performance was never considered
- For the first time, critical equipment is now considered a component of the structure
- All states have adopted one version of the code

BACKGROUND

WHAT IS THE IBC CODE?

- The IBC is the first of 14 volumes of the code group known as the International Codes
- It is the ***Structural Handbook*** for the building
- The American Society of Civil Engineer's handbook, ASCE 7-05 is the IBC's companion reference standard for design of buildings as well as *architectural, mechanical, electrical and plumbing components*
- The information and application of seismic & wind loads as they apply to these components do not appear in any of the other 13 International Code volumes
- Chapters 16 & 17 of the IBC Code define the design, testing and inspection requirements for all components that must demonstrate "on line" capability

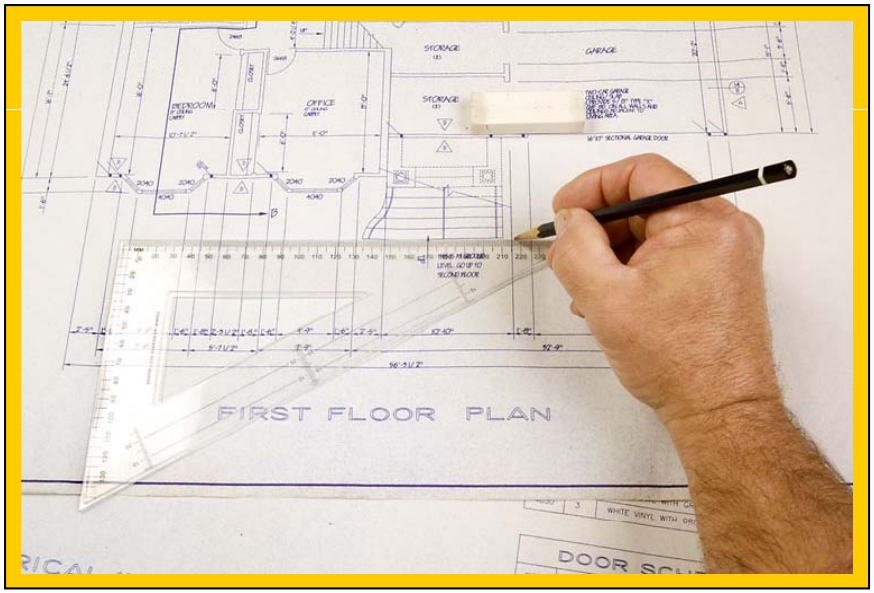
CODE
IMPLICATIONS

ROLES AND RESPONSIBILITIES

- The role of the architect, structural engineer, equipment specifying engineer, equipment dealer and installing contractor

ROLES AND RESPONSIBILITIES

- The architect

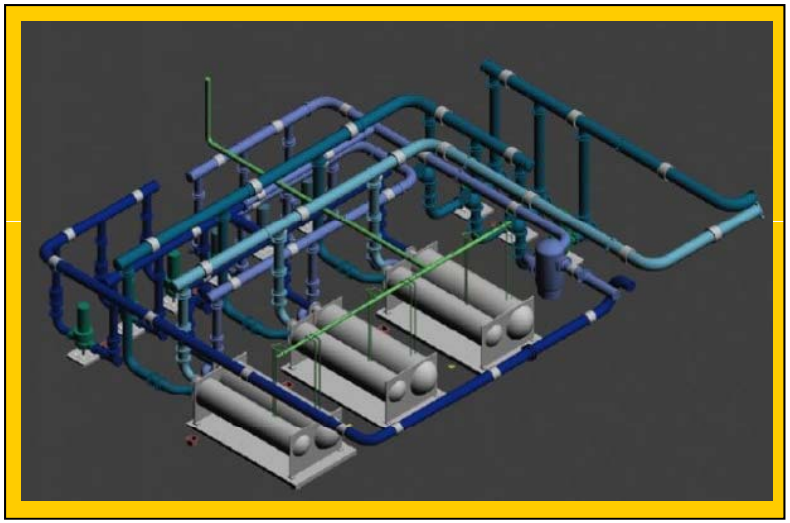


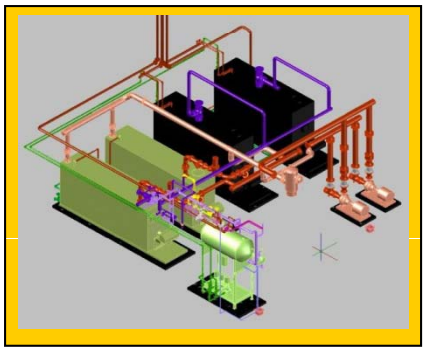
ROLES AND RESPONSIBILITIES

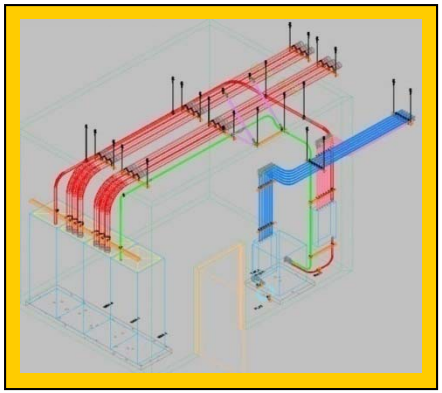
- The structural engineer

ROLES AND RESPONSIBILITIES

- The equipment specifying engineer







ROLES AND RESPONSIBILITIES

- The equipment dealer/supplier

ROLES AND RESPONSIBILITIES

- The installing contractor

ROLES AND RESPONSIBILITIES

- The Special Inspector

CODE IMPLICATIONS

ESSENTIAL FACILITIES

CHAPTER 16

STRUCTURAL DESIGN

SECTION 1601 GENERAL

1601.1 Scope. The provisions of this chapter shall govern the structural design of buildings, structures and portions thereof regulated by this code.

SECTION 1602 DEFINITIONS AND NOTATIONS

1602.1 Definitions. The following words and terms shall, for the purposes of this chapter, have the meanings shown herein.

ALLOWABLE STRESS DESIGN. A method of proportioning structural members, such that elastically computed stresses produced in the members by nominal loads do not exceed specified allowable stresses (also called "working stress design").

BALCONY, EXTERIOR. An exterior floor projecting from and supported by a structure without additional independent supports.

DEAD LOADS. The weight of materials of construction incorporated into the building, including but not limited to walls, floors, roofs, ceilings, stairways, built-in partitions, finishes, cladding and other similarly incorporated architectural and structural items, and the weight of fixed service equipment, such as cranes, plumbing stacks and risers, electrical feeders, heating, ventilating and air-conditioning systems and fire sprinkler systems.

DECK. An exterior floor supported on at least two opposing sides by an adjacent structure, and/or posts, piers or other independent supports.

DESIGN STRENGTH. The product of the nominal strength and a resistance factor (or strength reduction factor).

DIAPHRAGM. A horizontal or sloped system acting to transmit lateral forces to the vertical-resisting elements. When the term "diaphragm" is used, it shall include horizontal bracing systems.

Diaphragm, blocked. In light-frame construction, a diaphragm in which all sheathing edges not occurring on a framing member are supported on and fastened to blocking.

Diaphragm boundary. In light-frame construction, a location where shear is transferred into or out of the diaphragm sheathing. Transfer is either to a boundary element or to another force-resisting element.

Diaphragm chord. A diaphragm boundary element perpendicular to the applied load that is assumed to take axial stresses due to the diaphragm moment.

Diaphragm flexible. A diaphragm is flexible for the purpose of distribution of story shear and torsional moment where so indicated in Section 12.3.1 of ASCE 7, as modified in Section 1613.6.1.

Diaphragm, rigid. A diaphragm is rigid for the purpose of distribution of story shear and torsional moment when the lateral deformation of the diaphragm is less than or equal to two times the average story drift.

DURATION OF LOAD. The period of continuous application of a given load, or the aggregate of periods of intermittent applications of the same load.

ESSENTIAL FACILITIES. Buildings and other structures that are intended to remain operational in the event of extreme environmental loading from flood, wind, snow or earthquakes.

FABRIC PARTITIONS. A partition consisting of a finished surface made of fabric, without a continuous rigid backing, that is directly attached to a framing system in which the vertical framing members are spaced greater than 4 feet (1219 mm) on center.

LIVE LOADS. Those loads produced by the use and occupancy of the building or other structure and do not include construction or environmental loads such as wind load, snow load, rain load, earthquake load, flood load or dead load.

LIVE LOADS (ROOF). Those loads produced (1) during maintenance by workers, equipment and materials; and (2) during the life of the structure by movable objects such as planters and by people.

LOAD AND RESISTANCE FACTOR DESIGN (LRFD). A method of proportioning structural members and their connections using load and resistance factors such that no applicable limit state is reached when the structure is subjected to appropriate load combinations. The term "LRFD" is used in the design of steel and wood structures.

LOAD EFFECTS. Forces and deformations produced in structural members by the applied loads.

LOAD FACTOR. A factor that accounts for deviations of the actual load from the nominal load, for uncertainties in the analysis that transforms the load into a load effect, and for the probability that more than one extreme load will occur simultaneously.

LOADS. Forces or other actions that result from the weight of building materials, occupants and their possessions, environ-

ESSENTIAL FACILITIES. Buildings and other structures that are intended to remain operational in the event of extreme environmental loading from flood, wind, snow or earthquakes.

CODE
IMPLICATIONS

OCCUPANCY CATEGORY IV BUILDINGS

- At a *minimum*, IBC Certification and installation details are required for the following ***essential facilities***:
  - Hospitals and other healthcare facilities
  - Fire, rescue and police stations
  - Designated earthquake, hurricane or other emergency shelters
  - 911, communication, data, switching, operation – centers
  - Most power-generating stations and other public utility facilities
  - Structures containing highly toxic materials
  - Buildings and structures having critical national defense functions
  - Most water treatment facilities
  - Aviation control towers, air traffic control centers, emergency aircraft hangers and some terminal buildings

CODE
IMPLICATIONS

OCCUPANCY CATEGORY IV BUILDINGS

- If the building is intended to remain operational after extreme environmental load then the critical equipment supporting the operation of the building must remain operational
- For wind -- equipment needs to be designed in accordance with ASCE 7 Chapter 6, MWFRS
- For seismic – equipment needs to be designed in accordance with ASCE 7 Chapter 13

1.3.5 Counteracting Structural Actions. All structural members and systems, and all components and cladding in a building or other structure, shall be designed to resist forces due to earthquake and wind, with consideration of overturning, sliding, and uplift, and continuous load paths shall be provided for transmitting these forces to the foundation. Where sliding is used to isolate the elements, the effects of friction between sliding elements shall be included as a force. Where all or a portion of the resistance to these forces is provided by dead load, the dead load shall be taken as the minimum dead load likely to be in place during the event causing the considered forces. Consideration shall be given to the effects of vertical and horizontal deflections resulting from such forces.

SEISMIC

CODE
IMPLICATIONS

COMPONENT IMPORTANCE FACTOR

13.1.3 Component Importance Factor *ASCE 7-05*

Section 13.1.3- Component Importance Factor.

All components shall be assigned a component importance factor as indicated in this section. The component importance factor, I_p, shall be taken as 1.5 if any of the following conditions apply:

1. The component is required to function for life-safety purposes after an earthquake, including fire protection sprinkler systems.
2. The component contains hazardous materials.
3. The component is in or attached to an Occupancy Category IV structure and it is needed for continued operation of the facility or its failure could impair the continued operation of the facility.

All other components shall be assigned a component importance factor, Ip, equal to 1.0.

IBC CODE

OEM RESPONSIBILITY

DESIGNATED SEISMIC SYSTEMS: The seismic force-resisting system and those architectural, electrical, and mechanical systems or their components that require design in accordance with Chapter 13 and for which the component importance factor, I_p, is greater than 1.0.

IBC CODE

OEM RESPONSIBILITY

1708.5 Seismic qualification of mechanical and electrical equipment. The registered design professional in responsible charge shall state the applicable seismic qualification requirements for designated seismic systems on the construction documents. Each manufacturer of designated seismic system components shall test or analyze the component and its mounting system or anchorage and submit a certificate of compliance for review and acceptance by the registered design professional in responsible charge of the design of the designated seismic system and for approval by the building official. Qualification shall be by an actual test on a shake table, by three-dimensional shock tests, by an analytical method using dynamic characteristics and forces, by the use of experience data (i.e., historical data demonstrating acceptable seismic performance) or by a more rigorous analysis providing for equivalent safety.

CODE
IMPLICATIONS

INTERRELATIONSHIP CLAUSE

13.2.3 Consequential Damage, ASCE 7-05

Consequential Damage- The functional and physical interrelationship of components, their supports, and their effect on each other shall be considered so that the failure of an essential or nonessential architectural, mechanical, or electrical component shall not cause the failure of an essential architectural, mechanical, or electrical component.

RESPONSIBILITY

- The IBC clearly provides that it is the responsibility of:
  - Equipment manufacturers
  - Suppliers
  - Installers
  - Design Team Managers
  - Engineers

to insure that their component remains “on line and functional” *after the emergency has occurred!*

CODE REQUIREMENTS

RESPONSIBILITY

TABLE 1604.5
OCCUPANCY CATEGORY OF BUILDINGS AND OTHER STRUCTURES

OCCUPANCY CATEGORY	NATURE OF OCCUPANCY
I	Buildings and other structures that represent a low hazard to human life in the event of failure, including but not limited to: • Agricultural facilities. • Certain temporary facilities. • Minor storage facilities.
II	Buildings and other structures except those listed in Occupancy Categories I, III and IV
III	Buildings and other structures that represent a substantial hazard to human life in the event of failure, including but not limited to: • Covered structures whose primary occupancy is public assembly with an occupant load greater than 300. • Buildings and other structures with elementary school, secondary school or day care facilities with an occupant load greater than 250. • Buildings and other structures with an occupant load greater than 500 for colleges or adult education facilities. • Health care facilities with an occupant load of 50 or more resident patients, but not having surgery or emergency treatment facilities. • Jails and detention facilities. • Any other occupancy with an occupant load greater than 5,000. • Power-generating stations, water treatment for potable water, waste water treatment facilities and other public utility facilities not included in Occupancy Category IV. • Buildings and other structures not included in Occupancy Category IV containing sufficient quantities of toxic or explosive substances to be dangerous to the public if released.
IV	Buildings and other structures designated as essential facilities, including but not limited to: • Hospitals and other health care facilities having surgery or emergency treatment facilities. • Fire, rescue and police stations and emergency vehicle garages. • Designated earthquake, hurricane or other emergency shelters. • Designated emergency preparedness, communication, and operation centers and other facilities required for emergency response. • Power-generating stations and other public utility facilities required as emergency backup facilities for Occupancy Category IV structures. • Structures containing highly toxic materials as defined by Section 307 where the quantity of the material exceeds the maximum allowable quantities of Table 307.1.(2). • Aviation control towers, air traffic control centers and emergency aircraft hangars. • Buildings and other structures having critical national defense functions. • Water treatment facilities required to maintain water pressure for fire suppression.

CODE
REQUIREMENTS

RESPONSIBILITY FOR SEISMIC

Listed on the project's **structural drawings (S1)**, under ***design loads,*** the following parameters are "red flags" that a project will have seismic requirements:

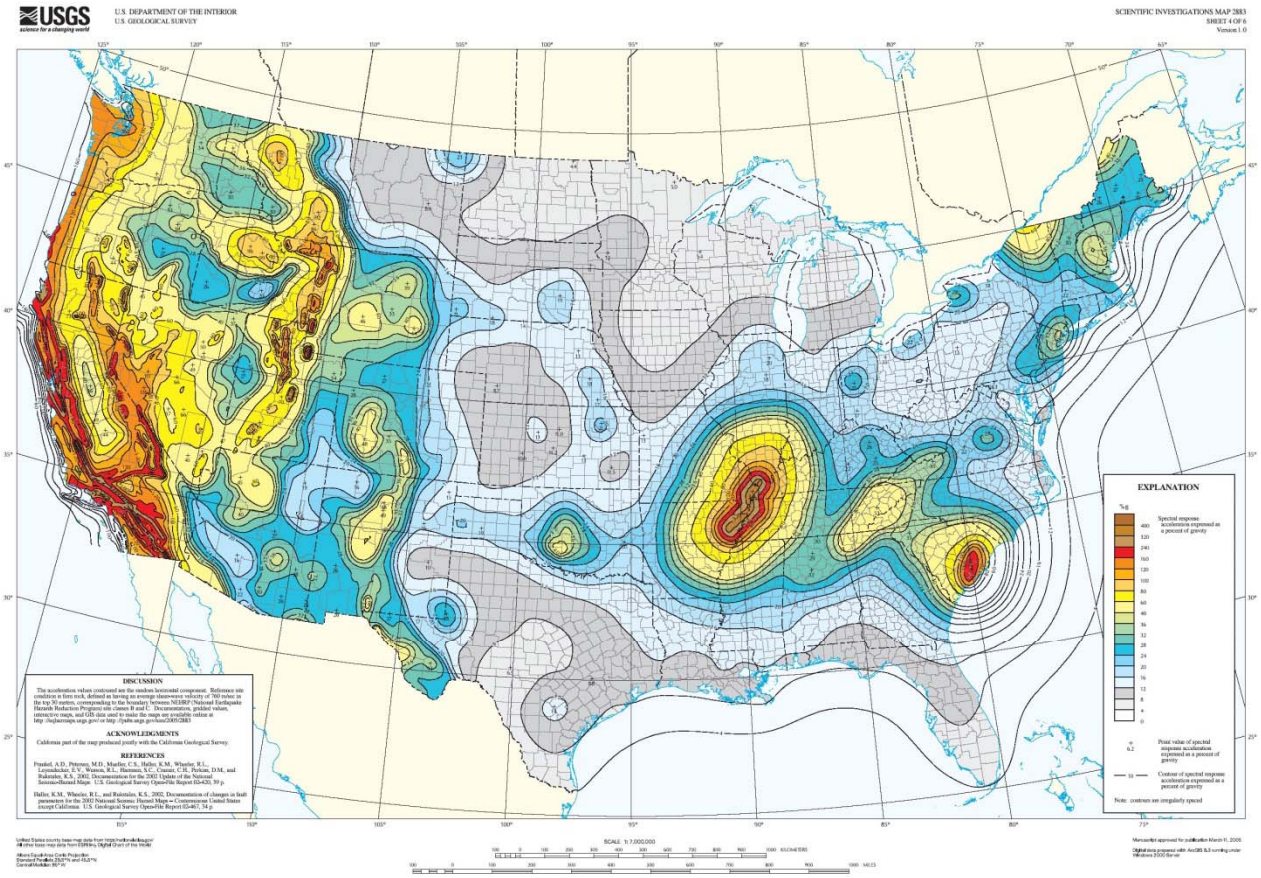
- An S_{DS} of .167 or greater
- Seismic Design Category of C, D, E or F

The S_{DS} value is needed for calculating the anchoring of equipment to the structure when Ip = 1.5 for SDC C, D, E or F and when Ip = 1.0 for SDC D, E or F.

When Ip = 1.5, equipment requires certification to the S_{DS} level listed ***and*** anchorage.

CODE
REQUIREMENTS

SHORT PERIOD SPECTRAL RESPONSE



Horizontal Spectral Response Acceleration for 0.2-Second Period (5 Percent of Critical Damping)
With 2 Percent Probability of Exceedance in 50 Years

SEISMIC-HAZARD MAPS FOR THE CONTERMINOUS UNITED STATES

By

Arthur D. Frankel, Mark D. Petersen, Charles S. Mueller, Kathleen M. Haller, Russell L. Wheeler, E.V. Leyendecker, Robert L. Wesson, Stephen C. Harmsen, Chris H. Cramer, David M. Perkins, and Kenneth S. Rukstales

2005

CODE
REQUIREMENTS

RESPONSIBILITY

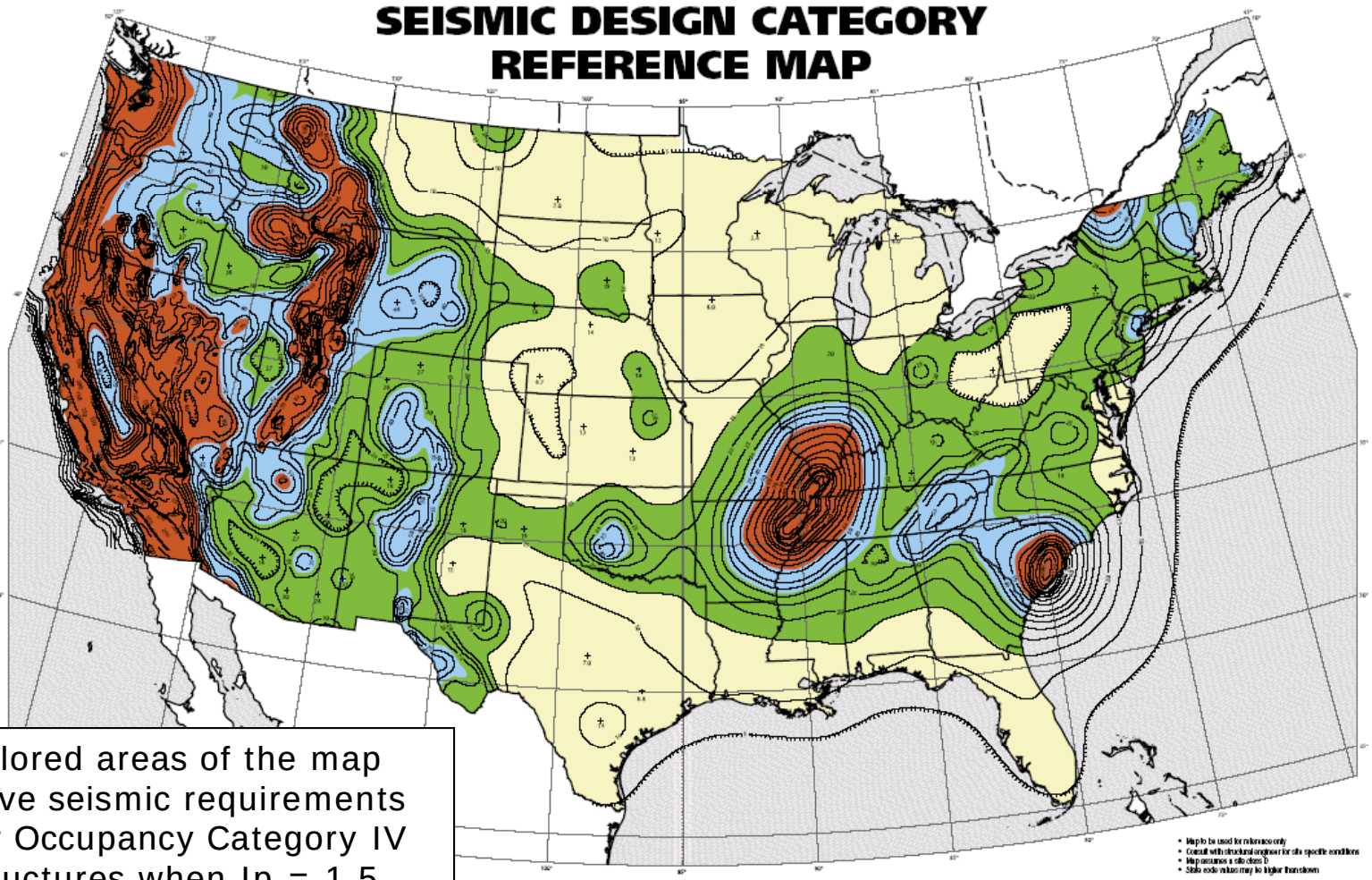
TABLE 1613.5.6(1)
SEISMIC DESIGN CATEGORY BASED ON SHORT-PERIOD RESPONSE ACCELERATIONS

VALUE OF S_{DS}	OCCUPANCY CATEGORY		
	I or II	III	IV
$S_{DS} < 0.167g$	A	A	A
$0.167g \le S_{DS} < 0.33g$	B	B	C
$0.33g \le S_{DS} < 0.50g$	C	C	D
$0.50g \le S_{DS}$	D	D	D

Equipment with an Ip = 1.5 located in buildings given a Seismic Design Category C, D or F (not listed in chart), require certification and proper seismic installation.

CODE REQUIREMENTS

WHEN DO I NEED SEISMIC?



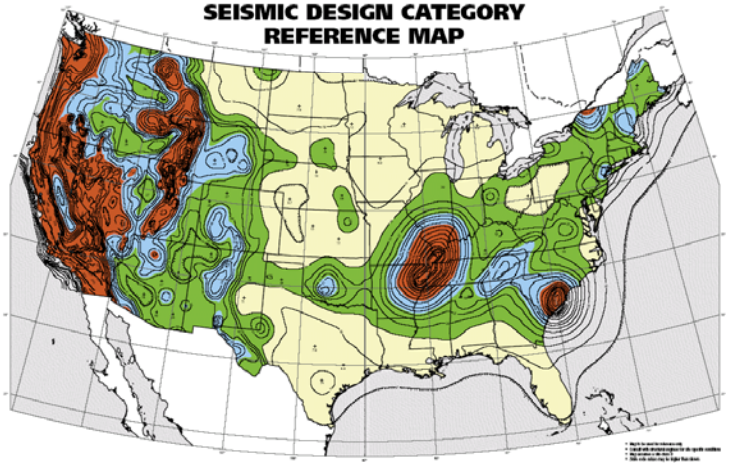
Colored areas of the map have seismic requirements for Occupancy Category IV structures when Ip = 1.5.

CODE
REQUIREMENTS

WHEN DO I NEED SEISMIC?

Seismic Design Category Based on Short-Period Response Accelerations

Value of S_{DS}	Occupancy Category		
	I or II	III	IV
$S_{DS} < 0.167g$	A	A	A
$0.167g \le S_{DS} < 0.33g$	B	B	C
$0.33g \le S_{DS} < 0.50g$	C	C	D
$0.50g \le S_{DS}$	D	D	D



CODE
IMPLICATIONS

COMPONENT IMPORTANCE FACTOR

13.1.3 Component Importance Factor *ASCE 7-05*

Section 13.1.3- Component Importance Factor.

All components shall be assigned a component importance factor as indicated in this section. The component importance factor, I_p, shall be taken as 1.5 if any of the following conditions apply:

1. The component is required to function for life-safety purposes after an earthquake, including fire protection sprinkler systems.
2. The component contains hazardous materials.
3. The component is in or attached to an Occupancy Category IV structure and it is needed for continued operation of the facility or its failure could impair the continued operation of the facility.

All other components shall be assigned a component importance factor, Ip, equal to 1.0.

CODE REQUIREMENTS

RESPONSIBILITY FOR SEISMIC – THE SPEC

C. Manufacturer Seismic Qualification Certification: Submit certification that fire pumps and drivers and fire-pump controllers, pressure-maintenance pumps, accessories, and specialties will withstand seismic forces defined in Division 21Section "Vibration and Seismic Controls for Fire-Suppression Piping and Equipment." Include the following:

A. This Section includes diesel-drive, [split-case,] [end-suction] centrifugal fire pumps and the following:

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.

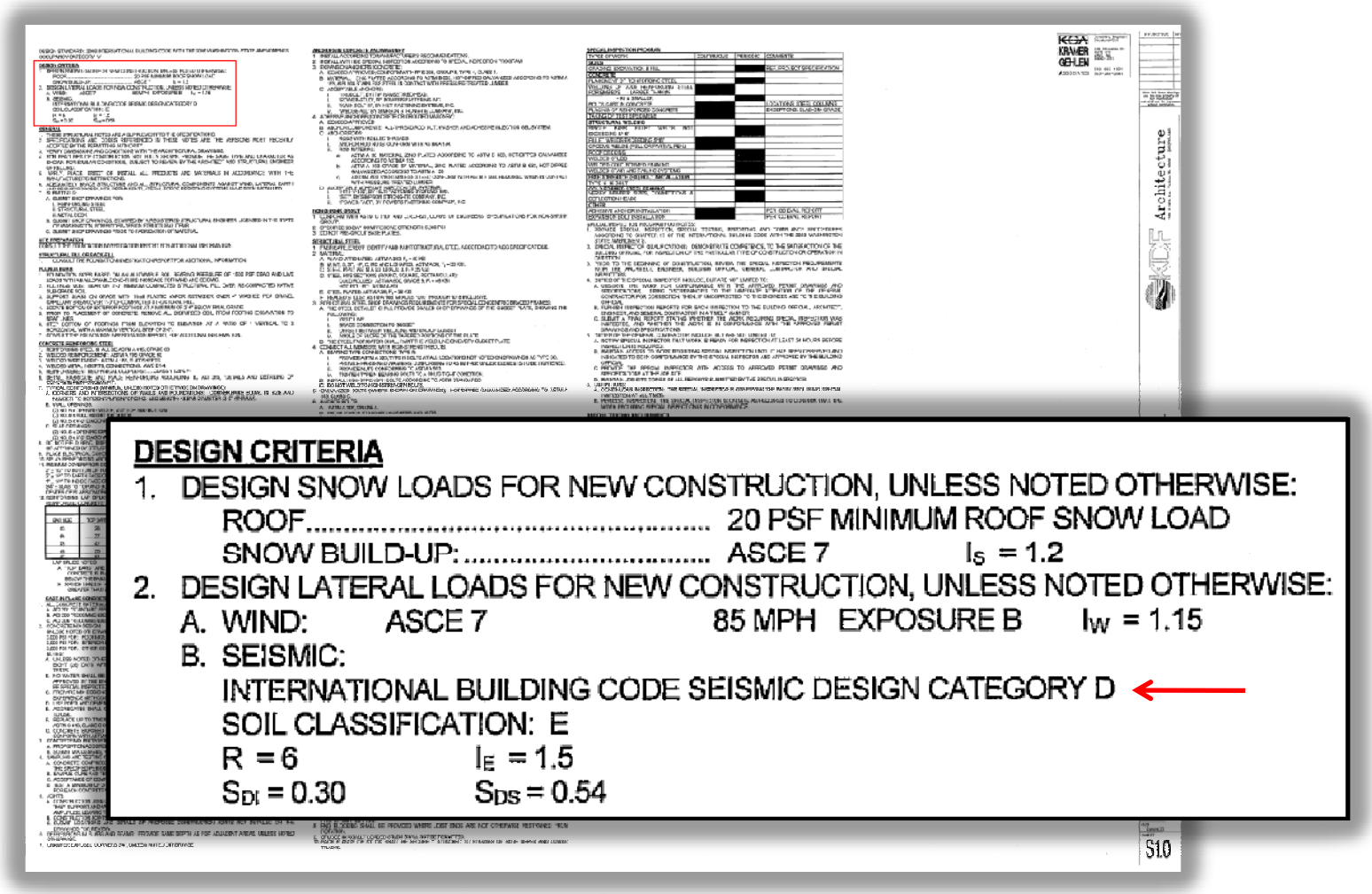
   a. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified."
   b. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."

1. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
2. Wiring Diagrams: Power, signal, and control wiring.

D. Product Certificates: For each type of fire pump and fire-pump controller, signed by product manufacturer.

CODE REQUIREMENTS

RESPONSIBILITY FOR SEISMIC



DESIGN CRITERIA

1. DESIGN SNOW LOADS FOR NEW CONSTRUCTION, UNLESS NOTED OTHERWISE:
   ROOF..... 20 PSF MINIMUM ROOF SNOW LOAD
   SNOW BUILD-UP:..... ASCE 7 I_S = 1.2
2. DESIGN LATERAL LOADS FOR NEW CONSTRUCTION, UNLESS NOTED OTHERWISE:
   A. WIND: ASCE 7 85 MPH EXPOSURE B I_W = 1.15
   B. SEISMIC:
   INTERNATIONAL BUILDING CODE SEISMIC DESIGN CATEGORY D ←
   SOIL CLASSIFICATION: E
   R = 6 I_E = 1.5
   S_{DI} = 0.30 S_{DS} = 0.54

CODE
REQUIREMENTS

RESPONSIBILITY FOR SEISMIC

Sample Seismic Conditions Specification Wording

For the purposes of seismic design, the following are the design parameters required for the project:

Seismic Design Category: (A, B, C, D, E, F)
Occupancy Category: (I, II, III, IV)
Short Period Response Acceleration (S_{DS}): (SE's notes)

The following components are considered designated seismic systems and are given a Component Importance Factor (Ip) of 1.5 per 13.1.3 of ASCE 7-05: [Insert Component Type Here]

As a designated seismic system, each manufacturer must shake test the component and its mounting system or anchorage and submit a certificate of compliance for review and acceptance by the registered design professional in charge of the system and for approval by the building official. Testing must be in accordance with ICC-ES AC 156.

The certification must be in compliance with 1708.5 of the IBC Code and must conform to the standards as referenced in Chapter 13 of ASCE 7-05. The equipment shall be properly labeled and clearly identify the manufacturer's identification, the equipment model or designation, information describing the component's performance characteristics and the name of the approved agency.

Certificates of compliance and labels shall include any limitations to the application of the equipment and clearly state the level of certification achieved. For seismic certification, the certification "g-level" should be denoted on the label and certificate of compliance by listing the S_{DS} to which the equipment is capable of withstanding and any limitations to the overall height in the building for where the equipment can be installed.

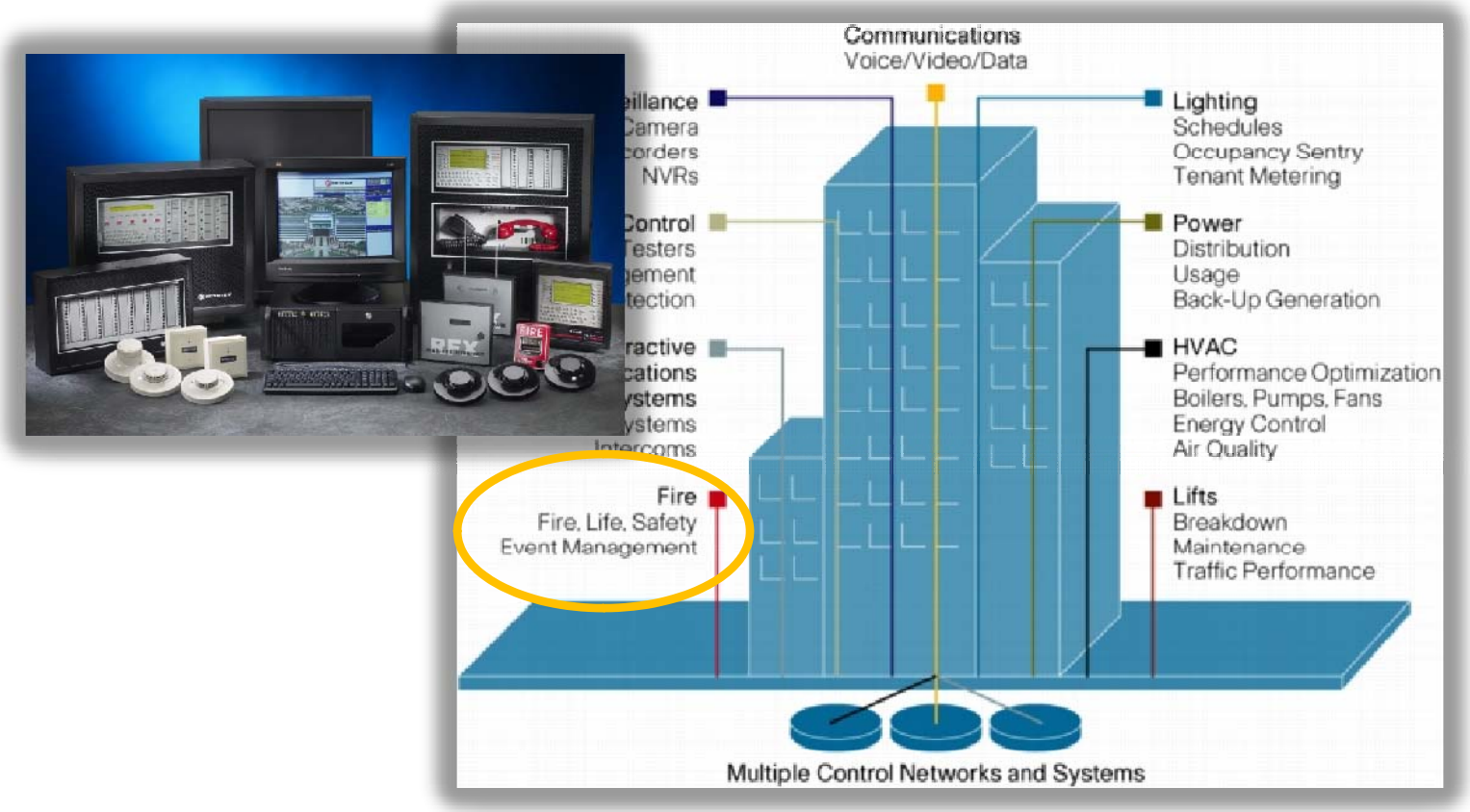
CODE
REQUIREMENTS

REQUIREMENTS FOR EQUIPMENT

For those components with an $I_p = 1.5$

- Special seismic certification for the equipment is required
- Labeling of equipment is required
- Proper seismic installation is required
- Special Inspections may be required

LIFE-SAFETY SYSTEMS



Life Safety Ip 1.5

Graphic Source: Cisco

REQUIREMENTS

ON LINE AND FUNCTIONAL

How does a manufacturer prove “On Line and Functional?”

- IBC Chapter 17, under Structural Tests and Special Inspections defines the “how”

By an:

- Approved Agency
- Special Inspector
- Certificate of Compliance
- Inspection Certificate
- Labeling of equipment

C OF C

ON LINE AND FUNCTIONAL

THE VMC GROUP
The Power of Together™

CERTIFICATE OF COMPLIANCE

NOTIFIER® by Honeywell

SEISMIC CERTIFICATION OF NON-STRUCTURAL ELECTRICAL COMPONENTS AND SYSTEMS

Notifier by Honeywell has CERTIFIED[1] the listed Fire Alarm System Products for seismic application. The basis of qualification was by shake testing and analysis, in accordance with the following building codes[2].

IBC 2000, IBC 2003, IBC 2006, IBC 2009, CBC 2007

Honeywell Brand	Model	Cabinet Style
Notifier	NFS2-3030 Intelligent Fire Alarm Control Panel with Voice	CAB-D4, CAB-C4 CAB-B4, CAB-A4
Notifier	NFS2-640 Intelligent Fire Alarm Control Panel with Voice	CAB-D4, CAB-C4 CAB-B4, CAB-A4
Notifier	NFS-320 Intelligent Single Loop Fire Alarm Control Panel	NFS-320
Notifier	XP Series Transponder Module	BB-XP
Notifier	FirstVision Interactive Firefighters Display	FIRSTVISION-ENC
Notifier	ACPS-610 Addressable Charger Power Supply	CAB-PS1
Notifier	BB-200 Back-Up Battery Box	BB-200
Notifier	BB-100 Back-Up Battery Box	BB-100
Notifier	NFS-LBB Back-Up Battery Box	BB-55
Notifier	BB-26 Back-Up Battery Box	BB-26
Notifier	BB-25 Auxiliary Equipment Box	BB-25
Notifier	BB-17 Back-Up Battery Box	BB-17
Notifier	FireVoice-25/50ZS (NFV-25/50ZS) Control Panel	05240
Notifier	FireVoice-25/50 (NFV-25/50) Control Panel	05240
Notifier	FireVoice-25/50DAZS (NFV-25/50DAZS) Control Panel	05240
Notifier	FireVoice-25/50DA (NFV-25/50DA) Control Panel	05240
Notifier	FireVoice-25/50ZST (NFV-25/50ZST) Control Panel	05240
Notifier	FireWarden-100-2 (NFW2-100) Addressable Fire Alarm Control Panel	05258
Notifier	FireWarden-50 (NFW-50) Addressable Fire Alarm Control Panel	05258
Notifier	RP-2002 Agent Releasing Panel	05258
Notifier	RP-2001 Pre-Action/Deluge Panel	05258
Notifier	SFP-10UD Fire Alarm Control Panel	05258
Notifier	SFP-5UD Fire Alarm Control Panel	05258
Notifier	FCPS-24FS8 Power Supply Panel	05209
Notifier	FCPS-24FS6 Power Supply Panel	05209
Notifier	SFP-2404 Fire Alarm Control Panel	05209
Notifier	SFP-2402 Fire Alarm Control Panel	05209
Notifier	ROME-8 Relay Panel	05209

A complete list of certified models, options, and installation methods are detailed in report number VMA-45894-01 as issued by The VMC Group.

All listed options MUST be installed per the manufacturer supplied seismic installation instructions. This certification includes the unit, as factory supplied, and installed directly to a wall using the fastening or anchoring method defined in the unit manufacturer's seismic installation instructions. This certification excludes all non-factory supplied accessories and the integrity of the wall or other supporting structure to which the unit is being attached.

The above referenced equipment is APPROVED for seismic application when properly installed[3] and used as intended. Lookup the actual, project specific, Design Spectral Response Acceleration at Short Periods, S_{DS}, value in the table below as it pertains to the applicable building code and compare to the allowed value shown. Below grade, grade, and roof-level installations are permitted by this certification, limited by the S_{DS} values in the table.

The basis of this certification was through successful tri-axis shake testing at internationally recognized Trentec Test Laboratory, under the witness of the Certified Seismic Qualification Agency, The VMC Group. Seismic shake table testing was conducted in accordance with ICC-ES AC-156 to envelope a required response spectrum (RRS) defined by a maximum flexible region acceleration (A_{FLEX}) of 3.09g and a zero period acceleration (A_{RIG}) of 2.32g.

This certification covers all applications that fall below the limitations in the tables below.

CBC 2007
S_{DS} <= 1.93
I_p <= 1.5
z/h <= 1.0 (roof)

IBC 2009 / 2006
S_{DS} <= 1.93
I_p <= 1.5
z/h <= 1.0 (roof)

IBC 2003 / 2000
S_{DS} <= 2.02
I_p <= 1.5
z/h <= 1.0 (roof)

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CERTIFICATE OF COMPLIANCE

NOTIFIER® by Honeywell

SEISMIC CERTIFICATION OF NON-STRUCTURAL ELECTRICAL COMPONENTS AND SYSTEMS

Notes and Comments:

1. All equipment listed herein successfully passed the seismic acceptance criteria for shake testing non-structural components and systems as set forth in the ICC AC-156 (2007). The test response spectrum (TRS) enveloped the design response spectrum (DRS) for all units tested. The units cited in this certification were representative samples of a contingent of models and all remained captive and structurally sound after the seismic shake simulation. The units also remained functionally operational after the simulation testing as functional testing was completed by the equipment manufacturer before and after the seismic simulations. Although a seismic qualified unit inherently contains some wind resisting capacity, that capacity is undetermined and is excluded from this certification. Snow/Ice loads have been neglected and thus limit the unit to be installed indoors.

2. The following building codes are addressed under this certification:

   IBC 2009 – referencing ASCE 7-05 and ICC AC-156
   CBC 2007 – referencing ASCE 7-05 and ICC AC-156
   IBC 2006 – referencing ASCE 7-05 and ICC AC-156
   IBC 2003 – referencing ASCE 7-02 and ICC AC-156
   IBC 2000 – referencing ASCE 7-98 and ICC AC-156

3. Refer to the manufacturer supplied installation details for special mounting considerations when installed for seismic application. Structural walls, structural floors, and concrete housekeeping pads must be designed and approved by the building Structural Engineer of Record to withstand the seismic loads imparted by the equipment listed herein. The installing contractor is responsible for observing the installation requirements provided by the unit manufacturer's seismic installation details and the proper installation of all anchors and/or mounting hardware, including coordinating any special inspections required.

4. The Seismic Design Acceleration used for anchor analysis, F_P/W_P, is defined per the building code (or respective design standard) for the section titled Seismic Design Requirements for Non-structural (architectural, mechanical, and electrical) Components. The LRFD calculation and seismic design level is shown below.

   CBC 2007 same as IBC 2006
   IBC 2009 / 2006 $F_P/W_P = 0.4 \times (S_{DS}=1.93) \times (I_P=1.5) \times (a_P/R_P=0.42) \times (1+2\,(z/h=1.0))$ = 1.46g
   IBC 2003 / 2000 $F_P/W_P = 0.4 \times (S_{DS}=2.02) \times (I_P=1.5) \times (a_P/R_P=0.40) \times (1+2\,(z/h=1.0))$ = 1.46g

   When the site soil properties or final equipment installation location are not known, the soil site coefficient, F_A, defaults to the Soil Site Class D coefficient. Soil Classes A, B, C, D, E, Seismic Use groups I, II, III, IV, and Seismic Design Categories A, B, C, D, E, and F are all covered under this certification, limited by the S_{DS} values on page 1, respective to the applicable building code, Importance factor, and z/h ratio. A seismic importance factor, I_P=1.5, applies to this certification to include essential facility requirements and life safety applications for post event functionality.

John P. Giuliano, PE
President, The VMC Group

Certification Issued By:	The VMC Group
Document Control Number:	VMA-45894-01A
Original Issue Date:	04 / 19 / 10
Revision Level:	0
Revision Date:	---
Expiration Date:	---

Paul A. Keurian
Director, Engineering Services
Honeywell Fire Systems

LABELLING

ON LINE AND FUNCTIONAL

NOTIFIER®
by Honeywell

Seismic Certification per Applicable Building Codes:
IBC 2000, IBC 2003, IBC 2006, IBC 2009, CBC 2007
Tested and Analyzed in Accordance With: ASCE 7-98, ASCE 7-02, ASCE 7-05, ASCE 7-10, ICC-ES AC-156
FIRE ALARM CONTROL PANEL

- Approved to Design Spectral Response Acceleration, Sds, not to exceed 1.93g for installation at or below roof level of the building (0.0 < z/h < = 1.0)
- Approved to a Design Spectral Response Acceleration, Sds, not to exceed 2.27g for installation at or below grade level of the building (z/h < = 0.0)
- Approved for life safety applications, Ip < = 1.5
- Reference Certificate of Compliance VMA - 45894-01 by the VMC Group

THE VMC GROUP

To comply with Seismic Approvals, SEISKIT-320/B26 KIT, must be installed. Refer to 53850.

53899:A • ECN 10-512

LABELLING

ON LINE AND FUNCTIONAL

OSP-0072-10	Honeywell, Notifier	Fire Alarm Control Panel	Several	1.93	1	December 31, 2013

http://www.oshpd.ca.gov/fdd/Pre-Approval/special_seismic_cert_pre-approval.html

IBC CODE

OEM RESPONSIBILITY

1708.5 Seismic qualification of mechanical and electrical equipment. The registered design professional in responsible charge shall state the applicable seismic qualification requirements for designated seismic systems on the construction documents. Each manufacturer of designated seismic system components shall test or analyze the component and its mounting system or anchorage and submit a certificate of compliance for review and acceptance by the registered design professional in responsible charge of the design of the designated seismic system and for approval by the building official. Qualification shall be by an actual test on a shake table, by three-dimensional shock tests, by an analytical method using dynamic characteristics and forces, by the use of experience data (i.e., historical data demonstrating acceptable seismic performance) or by a more rigorous analysis providing for equivalent safety.

IBC CODE

SPECIAL INSPECTION REQUIREMENTS

SECTION 1704
SPECIAL INSPECTIONS

1704.1 General. Where application is made for construction as described in this section, the owner or the registered design professional in responsible charge acting as the owner's agent shall employ one or more special inspectors to provide inspections during construction on the types of work listed under Section 1704. The special inspector shall be a qualified person who shall demonstrate competence, to the satisfaction of the building official, for inspection of the particular type of construction or operation requiring special inspection. These inspections are in addition to the inspections specified in Section 109.

SPECIAL INSPECTION REQUIREMENTS

1707.9 Designated seismic system verifications. The special inspector shall examine designated seismic systems requiring seismic qualification in accordance with Section 1708.5 and verify that the label, anchorage or mounting conforms to the certificate of compliance.

REQUIREMENTS

CONTRACTOR RESPONSIBILITY

SECTION 1706
CONTRACTOR RESPONSIBILITY

1706.1 Contractor responsibility. Each contractor responsible for the construction of a main wind- or seismic-force-resisting system, designated seismic system or a wind- or seismic-resisting component listed in the statement of special inspections shall submit a written statement of responsibility to the building official and the owner prior to the commencement of work on the system or component. The contractor's statement of responsibility shall contain the following:

1. Acknowledgment of awareness of the special requirements contained in the statement of special inspections;
2. Acknowledgment that control will be exercised to obtain conformance with the construction documents approved by the building official;
3. Procedures for exercising control within the contractor's organization, the method and frequency of reporting and the distribution of the reports; and
4. Identification and qualifications of the person(s) exercising such control and their position(s) in the organization.

A recording of today's webinar will be posted on www.magni-fire.com

Please complete the post webinar survey when you exit the meeting.

Contact Dan Corbett if you have any questions.


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