



And

The City of



...Partnering for the future, Today!

- The purpose of various Building Codes are to provide minimum standards to safeguard life, health, property, and public welfare by regulating and controlling the design, construction, quality of materials, use and occupancy, location and maintenance of all buildings, structures and certain equipment.
- Design Professionals, Inspectors and Tradespersons are licensed to protect the public

Purpose of Building Codes



- The first major model-code group
- Founded in 1915
- Located in Country Club Hills, Illinois
- Codes were adopted predominantly in the north central and northeastern states

Building Officials and Code Administration (BOCA)

- Formed in 1922
- Located in Whittier, CA
- First edition of the Uniform Building Code published in 1927
- Adopted by states west of the Mississippi River



International Conference of Building Officials (ICBO)



- Headquartered in Birmingham, Alabama
- Founded in 1940
- Published the Southern Building Code
- Widely accepted in the southeast

Southern Building Code Conference



- Uniform system of codes was necessary
- Representatives from each of the code organizations formed the ICC in 1994
- First edition of the International Building Code published in 2000

International Code Council (ICC)



And with all of this
we still have this?



Keys to a SMOOTH Commercial Permit Approval Process:

- Arrange for a presubmission meeting with the review team as soon as plans are of sufficient completeness to understand the project.
- Include Correct Project info, proper address/location, contact info
- Properly seal all technical submission with both the design professional's and the firm's seal.
- PLEASE provide project specific technical submissions without cut and paste errors from previous projects. (North Carolina Building Code references or 2006 IBC etc.)
- Provide a Copy of the Geotechnical Report
- Provide a Copy of a Complete Statement of Special Inspections
- Make sure that the Geotechnical report and the plans are consistent! (i.e. footing , foundation design, seismic site class etc.)
- Make sure that the Schedule of Special Inspections includes all required inspections.
- Be familiar with the IBC Plan review checklist!!!



NEW SECTION 1507.2.8.1
ROOF COVERING
UNDERLAYMENT IN HIGH
WIND AREAS

New provisions for the installation of roof covering underlayment have been added for geographical locations where winds are equal to or greater than 120 mph.

NEW SECTION 1507.16 ROOF GARDENS AND LANDSCAPED ROOFS

The IBC now provides a reference to the new IFC provisions for roof gardens and landscaped roofs as a means of managing the potential hazards that combustible materials on the roof could create.





NEW SECTION 1507.17
PHOTOVOLTAIC SYSTEMS

PHOTOVOLTAIC SYTEM REQUIREMENTS

- Labeled to identify fire classification in accordance with 1505.1
- Listed and labeled in accordance with UL 1703
- Installed per manufacture's installation instructions
- Wind resistance: Photovoltaic systems shall be tested in accordance with ASTM D3161
- The structural frame and roof construction supporting the load imposed upon the roof by the photovoltaic panels/modules shall comply with the requirements of Table 601.

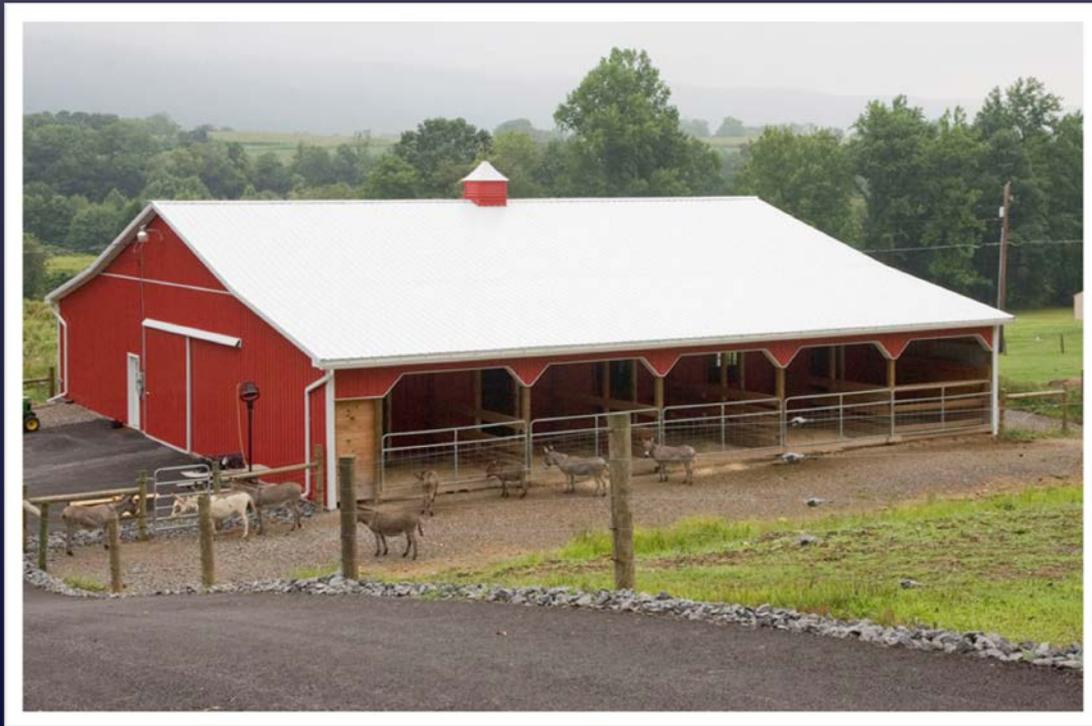
SECTION 1604.5 RISK CATEGORIES

- This section was referred to as “Occupancy Categories” which was termed as misleading as it implies something about the buildings occupants, not the risks associated with structural failure.
- As you will see some of the structure have little or no occupant load, yet failure would pose a substantial risk to the public.
- For the most part the categories are the same. But the name has been changed to “Risk Categories”.

RISK CATEGORY 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.



RISK CATEGORY II

Buildings and other structures except those listed in Risk Categories I, III and IV



RISK CATEGORY III

Buildings and other structures that represent a substantial hazard to human life in the event of failure, including but not limited to:

- Public assembly with an occupant load greater than 300;
 - Elementary school, secondary school or day care facilities with an occupant load greater than 250;
 - Adult education facilities, such as colleges and universities, with an occupant load greater than 500;
 - Group I-2 (Hospitals etc.) occupancies with an occupant load of 50 or more resident care recipients but not having surgery or emergency treatment facilities;
 - Group I-3 occupancies (Detention);
 - Any other occupancy with an occupant load greater than 5,000
- • Power-generating stations, water treatment facilities for potable water, waste water treatment facilities and other public utility facilities not included in Risk Category IV.
 - Buildings and other structures not included in Risk Category IV containing quantities of toxic or explosive materials that:
 - Exceed maximum allowable quantities per control area as given in Table 307.1(1) or 307.1(2) or per outdoor control area in accordance with the *International Fire Code*; and
 - Are sufficient to pose a threat to the public if released.

RISK CATEGORY III



RISK CATEGORY IV

Buildings and other structures designated as essential facilities, including but not limited to:

- Group I-2 occupancies having surgery or emergency treatment facilities.
- Fire, rescue, ambulance and police stations and emergency vehicle garages.
- Designated earthquake, hurricane or other emergency shelters.
- Designated emergency preparedness, communications and operations centers and other facilities required for emergency response.
- Power-generating stations and other public utility facilities required as emergency backup facilities for Risk Category IV structures.
- Buildings and other structures containing quantities of highly toxic materials that:
 - Exceed maximum allowable quantities per control area as given in Table 307.1(2) or per outdoor control area in accordance with the *International Fire Code*; and are sufficient to pose a threat to the public if released.
- Aviation control towers, air traffic control centers and emergency aircraft hangars.
- Buildings and other structures having critical national defense functions.
- Water storage facilities and pump structures required to maintain water pressure for fire suppression.

RISK CATEGORY IV



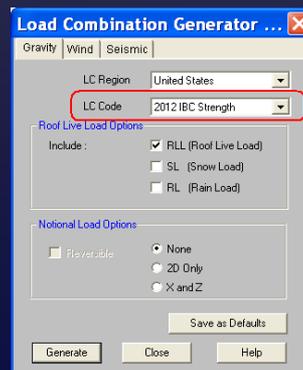
Above) This new and modern structure on E. White Street is the fire station of Rock Hill, said to be one of the most complete in the state. At the rear is located the police department of the city.



Section 1605.2 & 1605.3

Load combinations using strength design or load and resistance factor design & using allowable stress design.

- Please review Section 1605.
- In 1605.2, The IBC Load Combinations have been coordinated with the strength design load combinations of Section 2.3 of ASCE 7 and the loads due to fluids, F , and lateral earth pressures, ground water pressures, or the pressures of bulk materials, H .
- In 1605.3, The IBC Allowable Stress Design Load (ASD) Combinations have been coordinated with the ASD load combinations of Section 2.4 of ASCE 7.10.
- The equations in 1605 have been modified to reflect this.



1607.6 Helipads & 1607.7 Heavy vehicle loads

The Terminology and live load design requirements for helicopter landing areas have been updated and coordinated with ASCE 7-10.



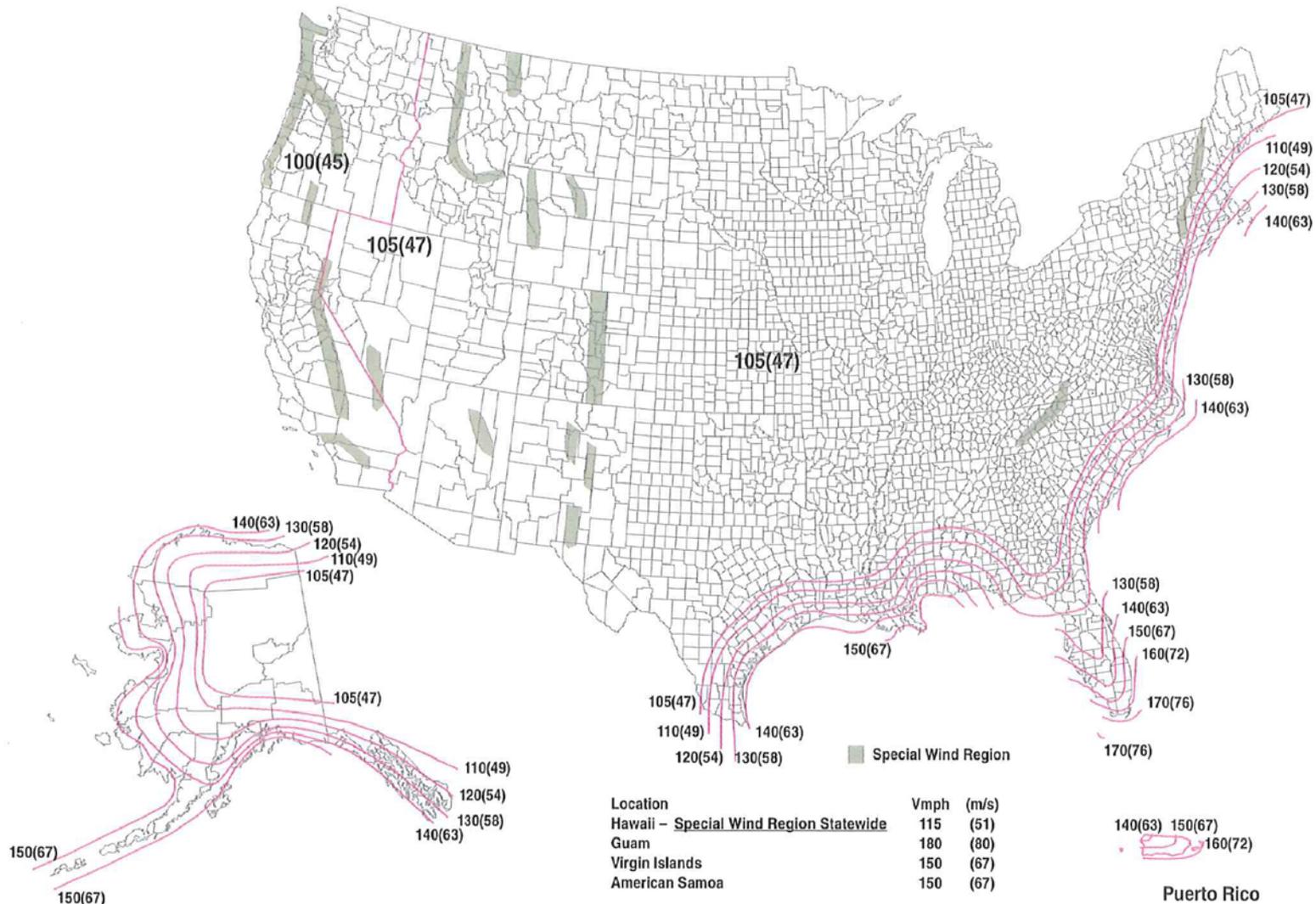
The design requirements for structures that support heavy vehicle loads in excess of 10,000 pounds (GVW) have been updated



1609 Wind Loads

- The wind design requirements of Section 1609 have been updated and coordinated with the latest wind load provisions in ASCE/SEI 7 (ASCE 7-10) and the wind load maps in the IBC are now based on “Ultimate Design Wind Speeds” which produce a strength level wind load similar to seismic load effects.
- Figures 1609 A through C now assign ultimate design wind speeds based on Risk Category as well as geography



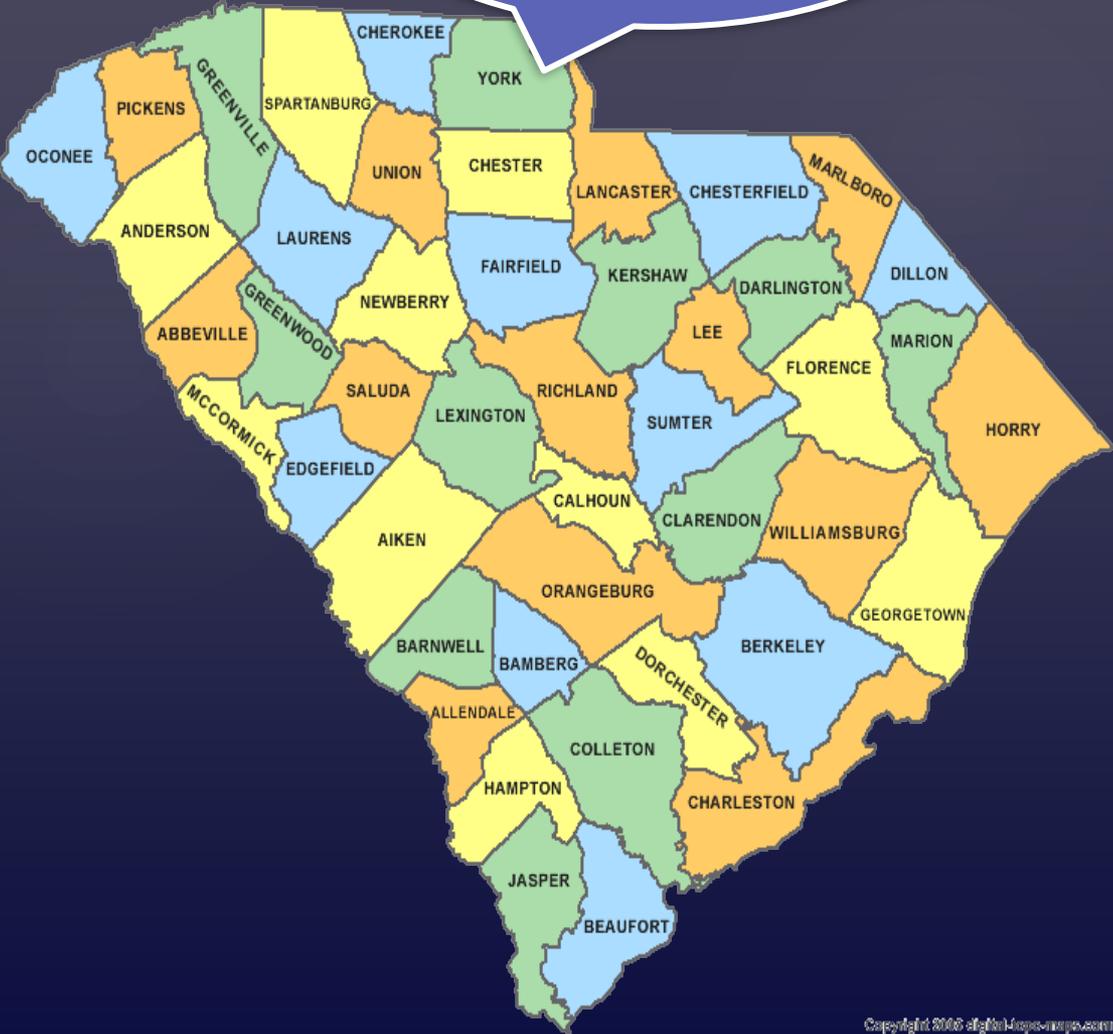


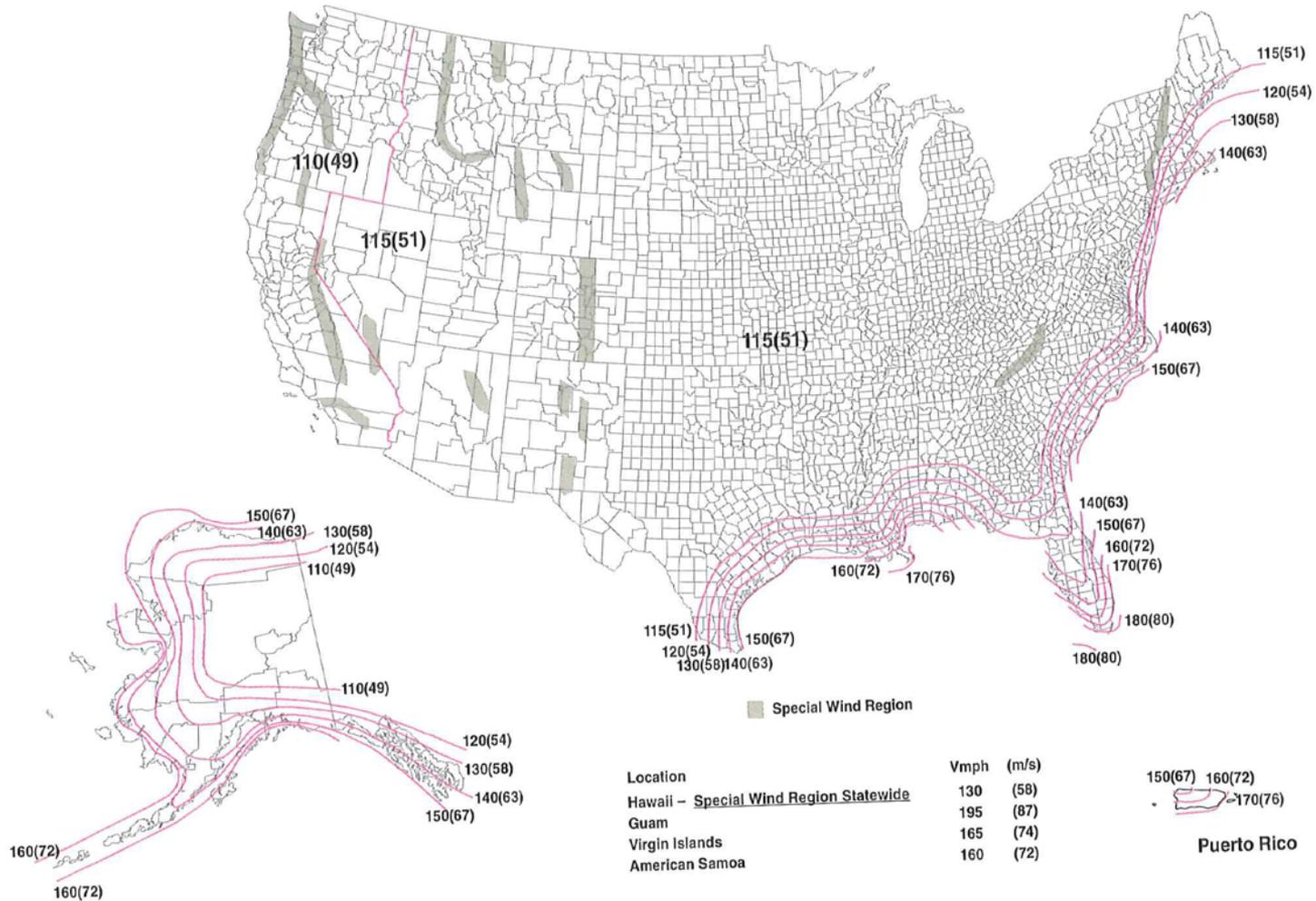
Notes:

1. Values are nominal design 3-second gust wind speeds in miles per hour (m/s) at 33 ft (10m) above ground for Exposure C category.
2. Linear interpolation between contours is permitted.
3. Islands and coastal areas outside the last contour shall use the last wind speed contour of the coastal area.
4. Mountainous terrain, gorges, ocean promontories, and special wind regions shall be examined for unusual wind conditions.
5. Wind speeds correspond to approximately a 15% probability of exceedance in 50 years (Annual Exceedance Probability = 0.00333, MRI = 300 years).

Figure 1609C Ultimate Design Wind Speeds, V_{ult} , For Risk Category I Buildings and Other Structures

Risk Category I
IBC Figure 1609 C
105 MPH





Notes:

1. Values are nominal design 3-second gust wind speeds in miles per hour (m/s) at 33 ft (10m) above ground for Exposure C category.
2. Linear interpolation between contours is permitted.
3. Islands and coastal areas outside the last contour shall use the last wind speed contour of the coastal area.
4. Mountainous terrain, gorges, ocean promontories, and special wind regions shall be examined for unusual wind conditions.
5. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (Annual Exceedance Probability = 0.00143, MRI = 700 years).

Figure 1609A Ultimate Design Wind Speeds, V_{ult} , For Risk Category II Buildings and Other Structures

RISK CATEGORY III & IV



Where:

V_{asd} = nominal design wind speed applicable to methods specified in Exceptions 1 through 5 of Section 1609.1.1

V_{ult} = ultimate design wind speeds determined from Figures 1609A, 1609B, or 1609C

TABLE 1609.3.1 Equivalent Basic Wind Speeds^{a,b,c}

V_{3S}	85	90	100	105	110	120	125	130	140	145	150	160	170
V_{fm}	71	76	85	90	95	104	109	114	123	128	133	142	152

For SI: 1 mile per hour = 0.44 m/s.

a. Linear interpolation is permitted.

b. V_{3S} is the 3-second gust wind speed (mph).

c. V_{fm} is the fastest mile wind speed (mph).

TABLE 1609.3.1 Wind Speed Conversions^{a,b,c}

V_{ul}	100	110	120	130	140	150	160	170	180	190	200
V_{asd}	78	85	93	101	108	116	124	132	139	147	155

a. Linear interpolation is permitted

b. V_{asd} = nominal design wind speed applicable to methods specified in Exceptions 1 through 5 of Section 1609.1.1

c. V_{ult} = ultimate design wind speeds determined from Figures 1609A, 1609B, or 1609C

EXCEPTIONS TO 1609.1.1 DETERMINATION OF WIND LOAD

- 1) Subject to the limitations of section 1609.1.1 the provisions of ICC 600 shall be permitted for applicable Group R-2 and R-3 buildings.
- 2) Subject to the limitations of Section 1609.1.1.1 residential structures using the provisions of AF&PA WFCM.
- 3) Subject to the limitations of Section 1609.1.1.1 residential structures using the provisions of AISI S230.
- 4) Designs using NAAMM FP 1001
- 5) Designs using TIA-222 for antenna supporting structures and antennas.
- 6) Wind tunnel tests in accordance with Chapter 31 of ASCE 7.



SECTION 1608.3 & 1611.2

PONDING INSTABILITY

- Susceptible bays of roofs shall be evaluated for ponding instability in accordance with Section 7.11 of ASCE 7. **(for consideration of progressive deflection)**
- **SUSCEPTIBLE BAY.** A roof or portion thereof with:
 - 1. A slope less than $\frac{1}{4}$ -inch per foot (0.0208 rad);
or
 - 2. On which water is impounded upon it, in whole or in part, and the secondary drainage system is functional but the primary drainage system is blocked.

A roof surface with a slope of $\frac{1}{4}$ -inch per foot (0.0208 rad) or greater towards points of free drainage is not a susceptible bay.



SECTION 1613.3.1

Mapped acceleration parameters(Seismic).

The IBC Seismic Ground Motion Maps have been updated to reflect the 2008 maps developed by the United States Geological Survey (USGS) National Seismic Mapping Project and the technical changes adopted for the 2009 *NEHRP Recommended Provisions for New Buildings and Other Structures* (FEMA P750)

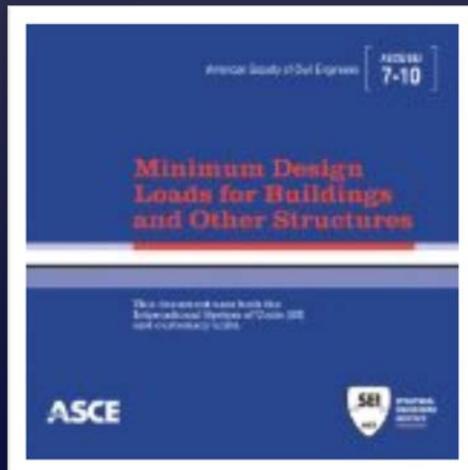


Section 1613.4 Alternatives to ASCE 7

Many of the alternatives to ASCE 7-05 were deleted because they were incorporated into ASCE 7-10

Section 1614 Atmospheric Ice Loads

This is a new section and definition added to provide consistency with ASCE 7-10



Section Deleted in 2009 IBC	Corresponding Section in ASCE 7-10
1613.6.1 Assumption of flexible diaphragm	12.3.1.1 Flexible Diaphragm Condition
1613.6.3 Automatic sprinkler systems	13.6.8.2 Fire Protection Sprinkler Piping Systems
1613.6.4 Autoclaved aerated concrete (AAC) masonry shear wall design coefficients and system limitations	Table 12.2-1 Design Coefficients and Factors for Seismic Force-Resisting Systems - Items 13 and 14
1613.6.5 Seismic controls for elevators	13.6.10 Elevator and Escalator Design Requirements
1613.6.6 Steel plate shear wall height limits	Section 12.2.5.4 Increased Structural Height Limit for Steel Eccentrically Braced Frames, Steel Concentrically Braced Frames, Steel Buckling-restrained Braced Frames, Steel Special Plate Shear Walls and Special Reinforced Concrete Shear Walls
1613.6.7 Minimum distance for building separation	12.12.3 Structural Separation
1613.6.8 HVAC Ductwork with $I_p = 1.5$	13.6.7 Ductwork
1613.7 ASCE 7, Section 11.7.5 Anchorage of walls	1.4.5 Anchorage of Structural Walls (SDC A) 12.11 Structural Walls and Their Anchorage

Section 1704.3

Statement of Special Inspections

The provisions requiring specific items to have special inspections and what information to be included in the statement have been clarified and coordinated, with previous conflicts resolved. To resolve these issues many deletions, revisions and a reorganization were undertaken to clarify the intent and improve proper application and administration.

STATEMENT OF SPECIAL INSPECTIONS

Identification of the Design Professional in Responsible Charge

Project: _____
Project Location: _____
Project Owner: _____
Address: _____
Phone: _____ Fax: _____ Email: _____

SC Registered Design Professional in Responsible Charge:

Name: _____
Firm (optional): _____
Address: _____
SC License No.: _____ Phone: _____ Fax: _____
Email: _____

Architect:

Firm (optional): _____
Address: _____
SC License No.: _____ Phone: _____ Fax: _____
Email: _____

Structural Engineer:

Firm (optional): _____
Address: _____
SC License No.: _____ Phone: _____ Fax: _____
Email: _____

This *Identification of the Design Professional in Responsible Charge* is submitted as a condition for permit issuance in accordance with the Special Inspection and Structural Testing requirements of the International Building Code. To be included with this form is a "Statement of Special Inspections" applicable to the project as well as a listing of the Special Inspector(s) and their qualifications (see reverse side of this form) and the identity of other approved agencies that are to be retained for conducting these inspections.

The Special Inspector shall keep records of all inspections and shall furnish inspection reports to the Design Professional in Responsible Charge and the Building Official as outlined in the South Carolina Department of Labor, Licensing and Regulation [Special Inspections Manual](#).

A *Final Report of Special Inspections* documenting completion of all required Special Inspections, testing and correction of any discrepancies noted in the inspections shall be submitted prior to issuance of a Certificate of Occupancy.

Design Professional in Responsible Charge:

Type or Print Name _____

Signature _____

Date _____

Individual Seal

Firm Seal (if applicable)

SECTION 1705.2 SPECIAL INSPECTION OF STEEL CONSTRUCTION



The 2010 Edition of AISC 360-10 (Specs for Structural Steel Buildings) contains quality assurance and inspection requirements for these buildings. The City of Rock Hill's Schedule of Special Inspections outlines these inspections.

SECTION 1705.2

SPECIAL INSPECTION OF STEEL CONSTRUCTION

SCHEDULE OF SPECIAL INSPECTION SERVICES				
PROJECT				
MATERIAL / ACTIVITY	SERVICE	APPLICABLE TO THIS PROJECT		
		Y/N	EXTENT	AGENT* DATE COMPLETED
1704.2.5 Inspection of Fabricators				
Verify fabrication/quality control procedures	In-plant review (3)		Periodic	
1705.1.1 Special Cases (work unusual in nature, including but not limited to alternative materials and systems, unusual design applications, materials and systems with special manufacturer's requirements)	Submittal review, shop (3) and/or field inspection			
1705.2 Steel Construction				
1. Fabricator and erector documents (Verify reports and certificates as listed in AISC 360, chapter N, paragraph 3.2 for compliance with construction documents)	Submittal Review		Each submittal	
2. Material verification of structural steel	Shop (3) and field inspection		Periodic	
3. Embedments (Verify diameter, grade, type, length, embedment. See 1705.3 for anchors)	Field inspection		Periodic	
4. Verify member locations, braces, stiffeners, and application of joint details at each connection comply with construction documents	Field inspection		Periodic	
5. Structural steel welding:				
a. Inspection tasks Prior to Welding (Observe, or perform for each welded joint or member, the QA tasks listed in AISC 360, Table N5.4-1)	Shop (3) and field inspection		Observe or Perform as noted (4)	
b. Inspection tasks During Welding (Observe, or perform for each welded joint or member, the QA tasks listed in AISC 360, Table N5.4-2)	Shop (3) and field inspection		Observe (4)	
c. Inspection tasks After Welding (Observe, or perform for each welded joint or member, the QA tasks listed in AISC 360, Table N5.4-3)	Shop (3) and field inspection		Observe or Perform as noted (4)	
d. Nondestructive testing (NDT) of welded joints: <i>see Commentary</i>				
1) Complete penetration groove welds 5/16" or greater in <i>risk category III</i> or <i>IV</i>	Shop (3) or field ultrasonic testing - 100%		Periodic	
2) Complete penetration groove welds 5/16" or greater in <i>risk category II</i>	Shop (3) or field ultrasonic testing - 10% of welds minimum		Periodic	
3) Thermally cut surfaces of access holes when material $t > 2"$	Shop (3) or field magnetic Partical or Penetrant testing		Periodic	
4) Welded joints subject to fatigue when required by AISC 360, Appendix 3, Table A-3.1	Shop (3) or field radiographic or Ultrasonic testing		Periodic	
5) Fabricator's NDT reports when fabricator performs NDT	Verify reports		Each submittal (5)	
6. Structural steel bolting:	Shop (3) and field inspection			
a. Inspection tasks Prior to Bolting (Observe, or perform tasks for each bolted connection, in accordance with QA tasks listed in AISC 360, Table N5.6-1)			Observe or Perform as noted (4)	

b. Inspection tasks During Bolting (Observe the QA tasks listed in AISC 360, Table N5.6-2)			Observe (4)		
1) Pre-tensioned and slip-critical joints					
a) Turn-of-nut with matching markings			Periodic		
b) Direct tension indicator			Periodic		
c) Twist-off type tension control bolt			Periodic		
d) Turn-of-nut without matching markings			Continuous		
e) Calibrated wrench			Continuous		
2) Snug-tight joints			Periodic		
c. Inspection tasks After Bolting (Perform tasks for each bolted connection in accordance with QA tasks listed in AISC 360, Table N5.6-3)			Perform (4)		
7. Inspection of steel elements of composite construction prior to concrete placement in accordance with QA tasks listed in AISC 360, Table N6.1	Shop (3) and field inspection and testing		Observe or Perform as noted (4)		

NEW SECTION 1705.16 SPECIAL INSPECTION OF FIRE-RESISTANT PENETRATION AND JOINT SYSTEMS

Where penetration firestop systems and fire-resistant joint systems are used in high rise buildings and those building assigned to Risk Categories III and IV, they must be inspected by an approved agency as part of the special inspection process.



SECTION 1803.5.12 GEOTECHNICAL REPORTS FOR FOUNDATION AND RETAINING WALLS

The requirement for Geotechnical Reports to address earthquake loads for foundation and retaining walls in seismic design categories D, E, F has been modified so it only applies to those walls that support more than 6 feet of backfill.



CHAPTER 19

CONCRETE CONSTRUCTION

The provisions relating to concrete construction were deleted from Chapter 19 because they are contained in the 2011 edition of ACI 318 (*Building Code Requirements for Structural Concrete and Commentary*)



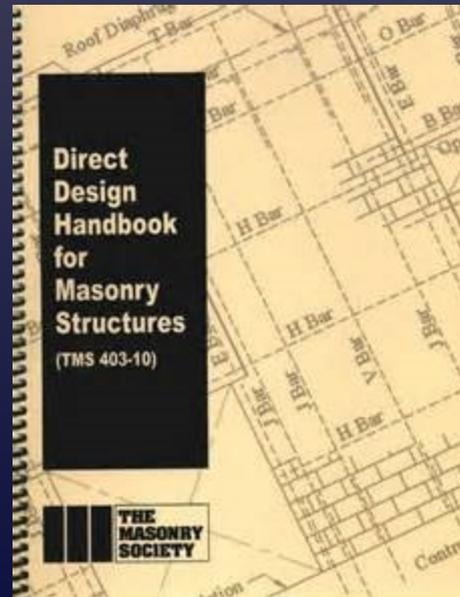
NEW SECTION 1905.1.3 SEISMIC DETAILING OF WALL PIERS

ACI 318 Section 21.4 provides seismic requirements for precast structural walls. Section 1905.1.3 amends ACI 318 Section 21.4 by adding seismic detailing requirements for walls in Seismic Design Categories, D, E and F.



NEW REFERENCE STANDARD TMS-403-10 DESIGN METHODS FOR MASONRY STRUCTURES

Provides a direct design method for simple, single-story, concrete masonry bearing-wall structures.



Thank you!!!!!!

Mike Nugent, C.B.O.
Building Official
Planning & Development
City of Rock Hill
P.O. Box 11706
155 Johnston Street (29731-1706)
Rock Hill, South Carolina 29731-1706
o: 803-329-5598

Mike.Nugent@cityofrockhill.com



ROCK HILL
SOUTH CAROLINA

Always on.