Flood Resistant Provisions of Connecticut's Newest Building Codes

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Risk Management & Resilience

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Overview

- 2018 Connecticut State Building Code Adoption
- National Flood Insurance Program (NFIP) and Building Codes
- Flood Provisions of the International Residential Code
- Flood Provisions of the International Building Code
- Resources

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Connecticut State Building Code

“The State Building Inspector, State Fire Marshal and the Codes and Standards Committee announced on December 29, 2016 intent to adopt the 2018 State Building and Fire Safety Codes based on the 2015 editions of the International Code Council (ICC) and National Fire Protection Association (NFPA) documents.”

– CT Department of Administrative Services

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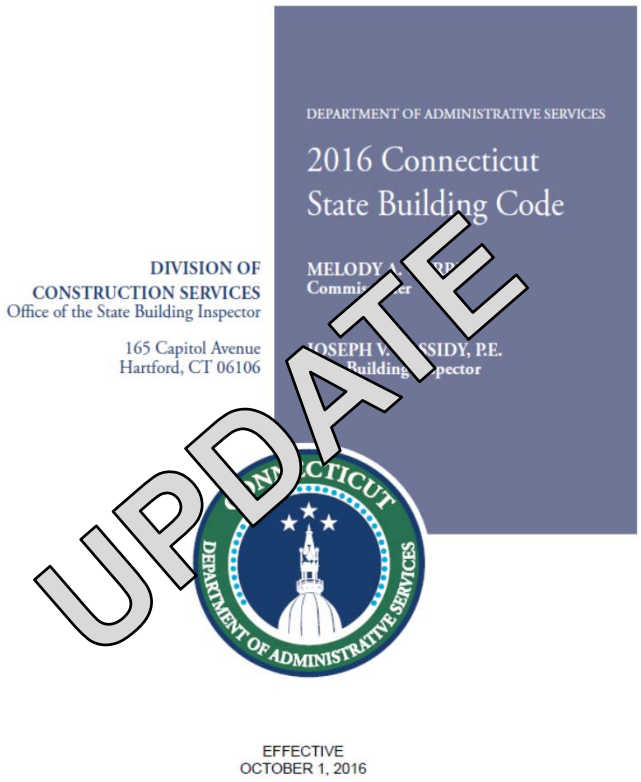
Proposed 2018 Connecticut State Building Code



- **2015 International Residential Code**
- **2015 International Building Code**
- 2015 International Existing Building Code
- 2015 International Energy Conservation Code
- 2015 International Mechanical Code
- 2015 International Plumbing Code
- 2015 International Fire Code
- 2015 NFPA 101 Life Safety Code
- 2017 NFPA 70 National Electrical Code
- 2009 ANSI A117.1 Accessible and Usable Buildings and Facilities.

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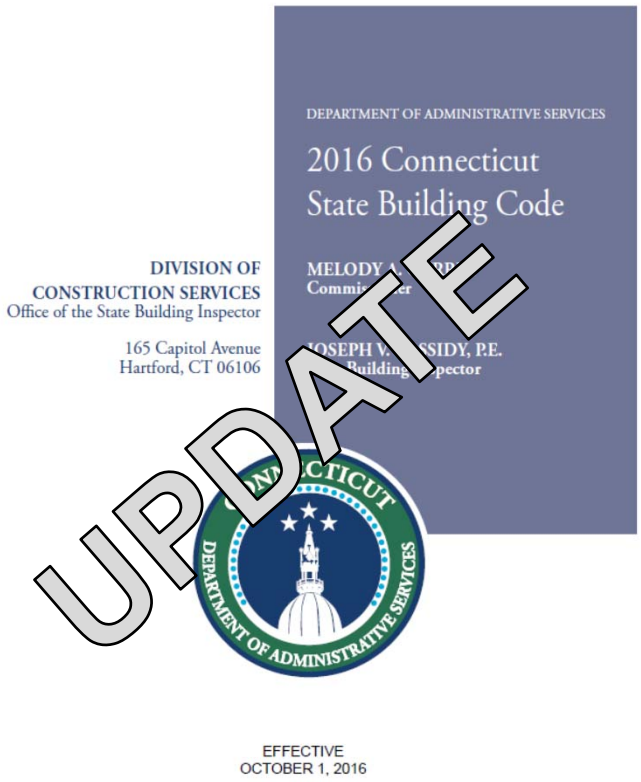
Proposed 2018 Connecticut State Building Code



Proposed amendments

- Likely administrative
- Should not weaken the I-Codes (did not in 2016)
- One public comment may impact one flood provision

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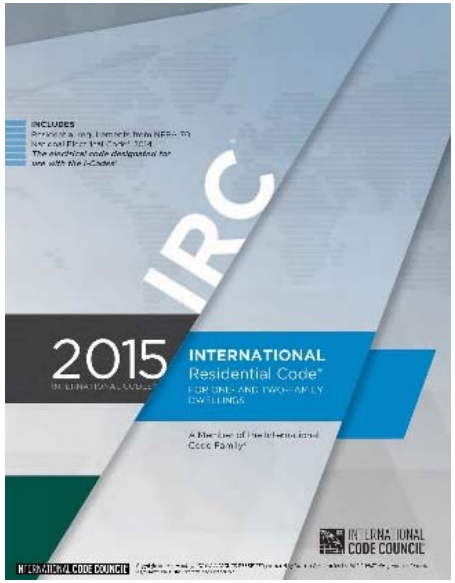
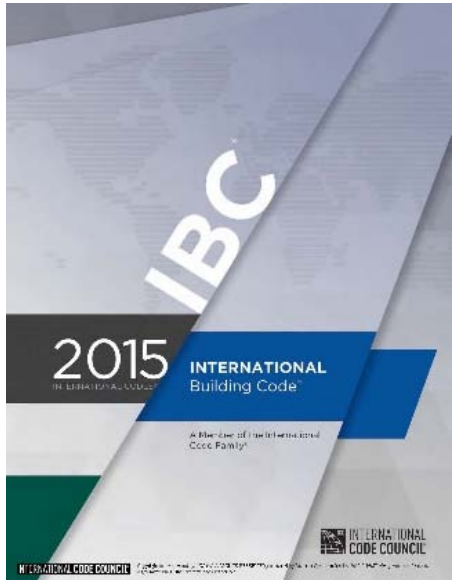
2015 International Codes and Referenced Standards



One- and two-family dwellings

Chapter 1. Administration

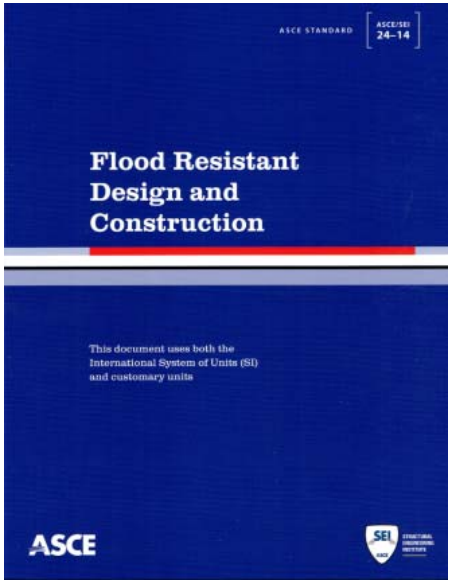
Section R322. Flood-Resistant Construction



All structures other than those covered by IRC

Chapter 1. Administration

Chapter 16. Structural Design Requirements



Required by IBC

Allowed by IRC in all flood zones, required in floodway

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“The 2009 and later I-Code flood provisions meet or exceed the National Flood Insurance Program requirements for buildings and structures.”

– Federal Emergency Management Agency

NFIP and Building Codes

- Common intent and purpose to protect public safety and reduce property damage
- NFIP regulations govern development in the floodplain
- Codes govern buildings and structures
- NFIP regulations largely unchanged since 1980s
- Building codes and standards updated on regular schedule using consensus process, experts, past experience
- Building codes can be more specific and include some higher standards

“ASFPM strongly believes the minimum NFIP floodplain regulations do not provide adequate long-term flood risk reduction for communities and that the benefits of flood risk reduction achieved by higher regulatory standards far outweighs the burden of administering them.”

– ASFPM Floodplain Regulations Committee

NFIP and Building Code

Building codes can be more specific and include some higher standards

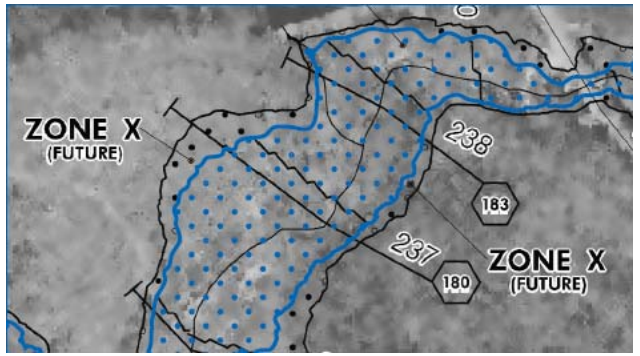
– Provide specific requirements for determining flood loads

– Detailed specifications, such as for pile foundations

– Allow for design flood greater than the base flood

– Stricter limitations on dry floodproofing

– Higher standards for critical facilities



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In the code amendment process, the state Building Inspector and the Codes and Standards Committee shall consider changes needed to increase the resilience of structures to flood and wind hazards… and shall consider resiliency standards endorsed or promulgated by the USDOE, FEMA, and other federal agencies."

– Governor Dannel Malloy, Executive Order 53

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Flood Provisions of International Residential Code Key Changes from 2012 to 2015

– Allow use of ASCE 24 as alternative in all flood zones
  - Previously only allowed in Coastal A Zone and Zone V

– Require 1 ft. freeboard in all flood zones
  - Previously only Coastal A Zone, and Zone V where LHSM is perpendicular to wave direction
  - Reduces exposure to flooding
  - Long-term savings exceed up-front costs
  - Reduces NFIP flood insurance premiums

Note: Annual premiums calculated using the *NFIP Flood Insurance Manual*, April 1, 2017, for a one-story single-family home with no basement and no enclosure. Premiums (including fees) are based on the maximum available building coverage of $250,000 and contents coverage of $100,000, with $2,000 deductibles for both building and contents coverages. Zone V building is assumed to be free of obstructions with a building replacement cost ratio of 0.75 or more.

Annual Flood Insurance Cost Based on Elevation Above BFE

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Flood Provisions of International Residential Code Key Changes from 2012 to 2015

- Coastal A Zone regulated like Zone V
  - Only if delineated, or designated by authority having jurisdiction
  - Exception: backfilled stem wall foundations allowed if designed to account for wave action, debris impact, erosion, and local scour
- Flood opening requirements
  - Separates requirement to include flood openings from requirement governing how openings are installed
    - To clarify that installation requirements apply to engineered openings
  - Net open area must account for louvers, blades, screens, faceplates, etc.
  - Require flood openings in breakaway walls
    - Prevents damage to walls during low level flooding

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Flood Provisions of International Residential Code Key Changes from 2012 to 2015

- Require exterior door at the top of access stairs enclosed by breakaway walls
  - Intended to prevent breach in building envelope
  - Minimize entry of wind-driven rain and waves
- New requirements for underground and above-ground tanks to be anchored or elevated

Source: FEMA, Hurricane Isaac

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Flood Provisions of the International Building Code
Key Changes from 2012 to 2015

– Defines Coastal A Zone and Limit of Moderate Wave Action

– Added requirement for emergency and standby power systems for Group I-2 Occupancies (hospitals, nursing homes)

- Comply with ASCE 24 where new or replacement essential electrical systems and generators are installed
- Direct result of Hurricane Sandy experience

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Flood Provisions of the International Building Code
Key Changes from 2012 to 2015
Through reference to updated ASCE 24-14

– Similar to changes to IRC
  - Regulate Coastal A Zone (if delineated/designated) like Zone V
  - Eliminate orientation of LHSM as factor in freeboard requirement
  - Flood openings
  - Exterior door at top of access stairs enclosed by breakaway walls

– Uses Flood Design Class instead of Occupancy/Risk Category

– Adds definitions for Mixed Use and Residential Portions of Mixed Use in commentary
  - Intended to clarify limitations on use of dry floodproofing measures

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Flood Provisions of the International Building Code
Key Changes from 2012 to 2015
Through reference to updated ASCE 24-14

– Increases required elevation of Flood Design Class 4 (Essential Facilities)
  - BFE + 2 ft, or DFE, or 500-year flood elevation, whichever is higher

– Requires means of escape and rescue above dry floodproofing elevation

– New Section on multi-story parking structures

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General and CT Code Resources

- CT Code Adoption Web page: http://portal.ct.gov/DAS/Office-of-State-Building-Inspector/Building-and-Fire-Code-Adoption-Process
- ICC Free eCode Viewer: https://codes.iccsafe.org/public/collections/I-Codes
- ICC Flood CodeMaster: http://shop.iccsafe.org/
- ICC Government Relations: http://www.iccsafe.org/about-icc/government-relations/map/connecticut/

TO BE ADDED TO EMAIL LIST FOR CONNECTICUT BUILDING CODE UPDATES:
send a request to **DAS.CodesStandards@ct.gov**.

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FEMA Flood Provisions Resources

- Flood Resistant Provisions of the 2015 International Codes
- Summary of Changes from the 2012 I-Codes
- NFIP 2015 I-Codes and ASCE 24 Checklist
- Highlights of ASCE 24-14, Flood Resistant Design and Construction
- Reducing Flood Losses through the International Codes: Coordinating Building Codes and Floodplain Management Regulations

https://www.fema.gov/building-code-resources

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Thank You

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