



MIKE CAUSEY
INSURANCE COMMISSIONER

BRIAN TAYLOR
STATE FIRE MARSHAL

February 29, 2024

Mr. Kevin P. Munson, P.E.
Residential Structures, P.C.
3410 N. Davidson Street.
Charlotte, NC 28205

RE: 2018 NCRC Section R301.1.3 Engineered design and ASCE 7-2010

Mr. Munson:

This letter is in response to your request dated and received September 25, 2023, for a formal interpretation from the Office of State Fire Marshal (“OSFM”). Requests are addressed below in the order in which they are posed.

Stated in relevant parts on 9/25/23:

“Verification of attached email regarding structural calculations:
When doing structural calculations for the Residential Code, the loads and wind speeds should come from the NC Residential Code, but load combinations and reductions based on combinations should come from ASCE 7, which is listed in Chapter 44.”

The request was clarified in the form of a question on 2/15/24 per the request of OSFM:

“We are asking if ASCE 7 load combinations can be used for the structural design of a building built under the residential code? We are not suggesting/implying that it is mandatory.”

Background and commentary:

Attachment A is comprised of the request for formal interpretation as well as all supporting information submitted with the request.

Code Analysis: Section R301 Design Criteria of the 2018 NC Residential Code (NCRC) specifies the minimum prescriptive design loads (dead, live, roof, flood, snow, wind and seismic) for buildings and structures built under the scope of this code. Engineered design in accordance with the 2018 North Carolina Building Code (NCBC) is permitted for buildings and structures, and parts thereof, included in the scope of the 2018 NCRC.

R301.1 Application. Buildings and structures, and parts thereof, shall be constructed to safely support all loads, including dead loads, live loads, roof loads, flood loads, snow loads, wind loads, and seismic loads as prescribed by this code. The construction of buildings and structures in accordance with the provisions of this code shall result in a system that provides a complete load path that meets the requirements for the transfer of loads from their point of origin through the load-resisting elements to the foundation. Buildings and structures constructed as prescribed by this code are deemed to comply with the requirements of this section.

OFFICE OF STATE FIRE MARSHAL

....

R301.1.3 Engineered Design. Where a building of otherwise conventional construction contains structural elements exceeding the limits of Section R301 or otherwise not conforming to this code, these elements shall be designed in accordance with accepted engineering practice. The extent of such design need only demonstrate compliance of nonconventional elements with other applicable provisions and shall be compatible with the performance of the conventional framed system. Engineered design in accordance with the *International Building Code* is permitted for buildings and structures, and parts thereof, included in the scope of this code.

....

R301.2 Climatic and Geographic Design Criteria. Buildings shall be constructed in accordance with the provisions of this code as limited by the provisions of this section. Additional criteria shall be established by the local *jurisdiction* and set forth in Table R301.2(1).

TABLE R301.2(1) CLIMATIC AND GEOGRAPHIC DESIGN CRITERIA

ROOF LOAD (psf)	WIND SPEED (mph)	SEISMIC DESIGN CATEGORY	SUBJECT TO DAMAGE FROM			WINTER DESIGN TEMP	ICE BARRIER UNDERLAYMENT REQUIRED	FLOOD HAZARDS ^b	AIR FREEZING INDEX	MEAN ANNUAL TEMP
			Weathering ^a	Frost line depth	Termite ^c					
20	Tables R301.2(4) & (5)	Table R301.2(7)	Moderate	12 inches	Moderate Heavy	Local	Local	Local	Local	Local

For SI: 1 pound per square foot = 0.0479 kPa, 1 mile per hour = 0.447 m/s.

a. Weathering may require a higher strength concrete or grade of masonry than necessary to satisfy the structural requirements of this code. The grade of masonry units shall be determined from ASTM C34, C55, C62, C73, C90, C129, C145, C216 or C652.

b. The jurisdiction shall fill in this part of the table with (a) the date of the jurisdiction's entry into the National Flood Insurance Program (date of adoptions of the first code or ordinance for management of flood hazard areas), (b) the date(s) of the currently effective FIRM and FBFM, or other flood hazard map adopted by the community, as may be amended.

c. Protection is required in all of North Carolina in accordance with Section R318.

....

Conclusions: Where ASCE 7-2010 and the 2018 NCBC is used for the structural design of buildings or structures that are within the scope of the 2018 NCRC, the structural design shall fully meet the requirements of ASCE 7 and the 2018 NCBC, including all dead loads, live loads, roof loads, flood loads, snow loads, wind loads, and seismic loads design criteria.

Sincerely,

A handwritten signature in black ink that reads "D.B. Rittlinger". The signature is fluid and cursive, with the initials "D.B." written prominently at the beginning.

David B. Rittlinger, PE, LEED AP
Division Chief – Codes & Interpretations
North Carolina Office of State Fire Marshal

cc: Bridget Herring, Chair – BCC
 Mark Matheny, Vice-Chair – BCC
 Rob Howard, Chair, Residential Super Committee - BCC
 Nathan Childs, Esq., NCDOJ, counsel for NC Building Code Council, nchilds@ncdoj.gov

ATTACHMENT A



APPENDIX E
APPEALS
NORTH CAROLINA
BUILDING CODE COUNCIL
1429 Rock Quarry Road, Suite 105
Raleigh, North Carolina 27610
(919) 647-0008
david.rittlinger@ncdoi.gov

APPEAL TO NCDOI/NCBCC Hearing Date ___/___/___

GS 153A-374, GS 160A-434 Formal Interpretation by NCDOI [checked]
Appeal of Local Decision to NCDOI ___
GS 143-140, GS 143-141 Appeal of Local Decision to NCBCC ___
Appeal of NCDOI Decision to NCBCC ___

APPELLANT KEVIN MANNION P.E. PHONE (704) 301-9521 x ___
REPRESENTING RESIDENTIAL STRUCTURES P.C.
ADDRESS 3410 N. DAVIDSON ST.
CITY CHARLOTTE STATE NC ZIP 28205
E-MAIL KEVIN@RESIDENTIALSTRUCTURES.PC.COM FAX () -

North Carolina State Building Code, Volume 2012/2013 NCRC - Section ___

REQUEST ONE: [checked] Formal Interpretation by NCDOI [] Appeal of Local Decision to NCBCC
[] Appeal of Local Decision to NCDOI [] Appeal of NCDOI Decision to NCBCC

Type or print. Include all background information as required by the referenced General Statutes and the attached policies. Attach additional supporting information.

VERIFICATION OF ATTACHED EMAIL REGARDING STRUCTURAL CALCULATIONS

When doing structural calculations for the Residential Code the loads and wind speeds should come from the NC Residential Code but load combinations and reductions based on the combinations should come from ASCE 7 which is listed in Chapter 44.

REASON: CLARIFICATION

APPEAL TO NCDOI/NCBCC

Signature [Signature]

DATE: 9/25/20

FORM 3/14/17

Kevin Munson

From: Murchison, Bill <bill.murchison@ncdoi.gov>
Sent: Thursday, October 22, 2020 5:11 PM
To: Kevin Munson
Cc: Rodgers, Jim; Yip, Pak; Martin, Carl
Subject: Structural Code Questions

Mr. Munson,

This is to confirm my comments from our phone conversation today.

Based on Section R101.1 when the NC Residential Code specifies the one of the International Codes that means the corresponding NC Code.

When doing structural calculations for the Residential Code the loads and wind speeds should come from the NC Residential Code but load combinations and reductions based on the combinations should come from ASCE 7 which is listed in Chapter 44.

If there are other questions please let me know.

Bill Murchison
Building Code Outreach Consultant
Engineering



N.C. Department of Insurance
Office of State Fire Marshal
919.647.0016 office
919.215.9226 cell

From: Kevin Munson <kevin@residentialstructurespc.com>
Sent: Thursday, October 22, 2020 [Assets that Bill Murchison has](#) 12:16 PM
To: Murchison, Bill <bill.murchison@ncdoi.gov>
Cc: Rodgers, Jim <jim.rodgers@ncdoi.gov>; Yip, Pak <pak.yip@ncdoi.gov>; Martin, Carl <Carl.Martin@ncdoi.gov>
nSubject: RE: [External] North Carolina Residential Code Question

CAUTION: External email. Do not click links or open attachments unless you verify. Send all suspicious email as an attachment to kevin@residentialstructurespc.com

Thanks Bill, I am specifically referring to section R301.1.1 of the NCRC. Also, regarding your response below I am referring to complying with the IBC. Your response below states "Complying with the International Residential Code is not the same as complying with the NC Residential Code" which of course is not the same as the NCRC has N.C. amendments. As a follow up please see additional questions below.

-In order to meet NCRC code requirements is it permissible to design a building/structure (included in the scope of the NCRC) utilizing an engineered design that complies with the International Building Code? If so I assume it is permissible to use the design loads and load combinations outlined in the IBC for determining the compilation of design loads. Provided the engineered design complies with the IBC, will this meet or exceed the requirements of the NCRC?

From: Rittlinger, David B <david.rittlinger@ncdoi.gov>
Sent: Thursday, February 15, 2024 12:37 PM
To: Kevin Munson <kevin@residentialstructurespc.com>
Cc: Seth Wheeler <seth@residentialstructurespc.com>
Subject: RE: [External] Code Interpretation 2012/2018 NCRC

Kevin,
Good afternoon.
Are you asking if ASCE 7 can be used for structural design of a building built under the residential code?
Or
Are you asking if it is mandatory to use ASCE 7 for load combinations and reductions?






Please clarify.
Thank you

<[image002.png](#)>
david.rittlinger@ncdoi.gov

Link to free view of 2018 NC Codes
<https://codes.iccsafe.org/codes/north-carolina>

Re: [External] Code Interpretation 2012/2018 NCRC

 Rittlinger, David B
To: Kevin Munson
Cc: Seth Wheeler

 Reply  Reply All  Forward  

Thu 2/15/2024 6:17 PM

Kevin,
Thank you for clarifying.
This helps me with the response
David Rittlinger
..... Sent from my iPhone

On Feb 15, 2024, at 1:06 PM, Kevin Munson <kevin@residentialstructurespc.com> wrote:

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We are asking if ASCE 7 load combinations can be used for the structural design of a building built under the residential code.

We are not suggesting/implying that it is mandatory.

Sincerely,

Kevin P. Munson, P.E.
Residential Structures, P.C.
Structural Engineering & Consulting

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<[image001.jpg](#)>