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ENGINEERING NEWSLETTER

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Contents

New Web Interpretations Posted

The following interpretations have been posted since the last Engineering Newsletter edition. The link directly to the interpretations webpage is http://www.ncdoi.com/OSFM/Engineering_and_Codes/Default.aspx?field1=Code_Interpretations&user=Code_Enforcement_Resources

2012 Building Code
Section 603.1 Combustible Wall Furring in Type I and II Construction

2012 Residential Code
Section 311.2 Exterior Egress Door Dimensions

New On-Line Link for Ordering N.C. Codes

If you want to order North Carolina Codes, you no longer need to go to the ICC Website and enter discounts, etc. Now, you can go to http://www.ncdoi.com/OSFM/Engineering_and_Codes/Default.aspx?field1=Codes_-_Code_Book_Sales&user=State_Building_Codes and click on "Purchase State Building Codes On-Line" in the middle of the page. That will take you to a page where the price you are given in the check-out already includes the discounts.

Of course, you can still walk in to our office at 322 Chapanoke Rd. in Raleigh and purchase your codes.

User-Friendly Version of the 1936 Code On-Line

The version of the 1936 North Carolina Building code posted on the Engineering and Codes website has been re-formatted to be more easily read and printed. You can find it at: http://www.ncdoi.com/OSFM/Engineering_and_Codes/Documents/State_Building_Codes/PastCodes/1936/1936%20NCBC.pdf

Heads Up!

This series of articles is intended to give a "Heads Up!" or reminder to building officials of code requirements or NC laws that the Engineering Division believes may often be over-looked or misunderstood by local building department personnel based on calls and emails to staff related to the requirement.

The Roles of the Code Officials and the State Board of Examiners of Plumbing, Heating, and Fire Sprinkler Contractors (*hereafter Board*) and Verification of Calculations for HVAC Systems- Manual J, Manual S, Manual D

This article is a reiteration of the roles of a Code Official and the Board with regards to verification of calculations of an HVAC system installed primarily in dwellings, but it is applicable in general for residential or commercial. The intent is to encourage Code Officials to understand the rules, and use as a resource, the State Board of Examiners of

Plumbing, Heating, and Fire Sprinkler Contractors in regards to load calculations and the performance of HVAC systems before and after installation.

Code Official's Role:

Requires "….For one and two-family dwellings and townhouses, heating and cooling equipment shall be sized in accordance with ACCA Manual S based on building loads calculated in accordance with ACCA Manual J, or other approved heating and cooling calculation methodologies." NCMC Section 312.1.

Similarly, Section 603.2 of the NCMC requires "…Ducts installed within a single dwelling unit shall be sized in accordance with ACCA Manual D or other approved methods…"

The three sets of calculations most commonly used for residential construction are ACCA Manual J, ACCA Manual S, and ACCA Manual D. Several reoccurring questions have come up concerning these calculations, and this article is restating the expectations of a Code Official's review of these calculations. The primary question asked is: "Is the permitting Agency required to take, review, and retain the calculations performed by the contractor for Manual J, Manual S, and Manual D?"

In short, the Code requires these calculations be performed, and be available, but no peer review is required.

Refer to Section 107.1 of the NC Administrative code for minimum inspections. As is the case for a review of plans from a design professional, a quick check certainly can be performed by experienced code officials, but a line-item by line-item review of the design professional's load calculations is usually not warranted or expected.

Likewise, it is within the permitting Agency's authority to require drawings and specifications and additional data as required in order to determine the compliance with the applicable Codes, refer to Section 106.2.1 and 106.2.2 of the NC Administrative Code. Some agencies require these calculations before a permit is issued, some before final inspection, and others not at all. Several agencies have a policy of scanning the Manual J, Manual S, and Manual D in, and keeping it with the other design documents. This also is effective, as it demonstrates that the calculations were performed, and does not slow turnaround time for a permit.

Please note that care is needed to be taken by the inspector if the licensee is directed to change the installation of equipment after performing a review in accordance with Manual J, D & S. Our observation has been that if a complaint is filed with the State Board of Examiners of Plumbing, Heating & Fire Sprinklers, the inspector will be asked for the basis of the modification. If an inspector mandated a design to the contractor, understand that the inspector could be held liable should a system performance problem surface.

The Role of State Board of Examiners of Plumbing, Heating, and Fire Sprinkler Contractors

In addition to the Mechanical Code, a licensee of the Plumbing, Heating, and Fire Sprinkler Contractor Board (Board) is subject to the rules set forth By **G.S. 87-21**, and in particular **21 NC Administrative Code 50.0505** which addresses General Supervision and

Standard of Competence. This Board is charged with the examination, regulation, investigation, and discipline of licensees (http://nclicensing.org/). As such, in cases where an in-depth investigation of performance is required, this Board should be the primary contact.

The requirements of the Board are sometimes used synonymously with the Building Code, but the Board Rules are more distinct for residential heating systems, especially in regards to zoning and temperature differentials. Also, the Board requires all licensees to perform, and keep records of, load calculations performed for each heating system, air conditioning system, or both, prior to the installation. Refer to paragraph (d) in a reprint of the **21 NCAC 50.0505** section below.

Excerpt of Board Rules:

21 NCAC 50 .0505 GENERAL SUPERVISION AND STANDARD OF COMPETENCE

…….

(b) The provisions of the North Carolina Building Code, including the provisions of codes and standards incorporated by reference, and adopted by the Building Code Council of North Carolina are the minimum standard of competence applicable to contractors licensed by the Board. Licensees shall design and install systems which *meet or exceed* the minimum standards of the North Carolina State Building Code, manufacturer's specifications and installation instructions and standards prevailing in the industry.

……..

(d) Every newly installed residential heating system, air conditioning system or both shall be designed and installed to maintain a maximum temperature differential of four degrees Fahrenheit room-to-room and floor-to-floor. On multilevel structures, contractors shall either provide a separate HVAC system for each floor or to install automatically controlled zoning equipment for each level with individual thermostats on each level to control the temperature for that level. The seasonal adjustment needed to maintain the four degrees Fahrenheit room-to-room and floor-to-floor maximum temperature differential shall not be accomplished through the use of manual dampers.

……..

(e) All licensed HVAC contractors or licensed technicians shall perform a room-by-room load calculation for all newly installed residential structures prior to installing heating systems, air conditioning systems, or both, which calculations shall be specific to the location and orientation where the HVAC system or equipment is to be installed. A written record of the system and equipment sizing information shall be provided to the homeowner, owner or general contractor upon request and a copy shall be maintained in the job file of the licensee for a minimum of six years. Load calculations shall be performed by a licensee who holds the appropriate license from this Board, or a licensee may utilize a load calculation carried out for this particular structure and location by a North Carolina Licensed Professional Engineer.

…….

(f) When either a furnace, condenser, package unit or air handler in an existing residential heating or air conditioning system is replaced, the licensed HVAC contractor or licensed technician is required to perform a minimum of a whole house block load

calculation. When a furnace, condenser, package unit or air handler in a residential heating or air conditioning system is replaced, the licensee shall ensure that all systems and equipment are properly sized. The licensee may utilize industry standards, reference materials, evaluation of the structure, and load calculations. A written record of the system and equipment sizing information shall be provided to the homeowner, owner or general contractor upon request and a copy shall be maintained in the job file of the licensee for a minimum of six years. If a load calculation was not performed or if a load calculation was performed and it is later determined by the Board that the unit installed was undersized or oversized, the installation will be considered as evidence of incompetence. Load calculations shall be performed by a licensee who holds the appropriate license from this Board, or a licensee may utilize load calculations carried out for this particular structure and location by a North Carolina Licensed Professional Engineer.

History Note: *Authority G.S. 87-18; 87-23; 87-26;*
Eff. February 1, 1976;
Readopted Eff. September 29, 1977;
Amended Eff. July 3, 2012; January 1, 2010; March 1, 2005; January 1, 2004; July 1, 2003; July 1, 1991; October 1, 1989; May 1, 1989.

Summary
In order to minimize redundancy, a code official should consider the statutory authority the Board has in governing its licensees, and use this knowledge in forming departmental policies with regard to calculations required and depth of review of those calculations.

Upcoming Seminars and Workshops

- The NC Building Inspector Association's **Winter Education Seminars** are open for registration. Go to http://www.ncbia.org/ for class schedules, locations and registration information.

- The NC Mechanical Inspector's Association Continuing Education Seminars have been planned and will be conducted as follows:

Monroe, NC	February 13th
Morganton, NC	March 13th
Wilson, NC	April 17th
Jacksonville, NC	May 15th
Burlington, NC	June 12th

Look for additional information in the January issue of the COCO newsletter.

- The NC Plumbing Inspector's Association has planned its 2013 CEU Workshops.

February 5	Edgecombe Community College	Rocky Mount, NC
March 12	2128 S. Sterling St.	Morganton, NC
May 8	211 S. Hamilton St.	High Point, NC
June 18	5353 N. Virginia Dare Trail	Kitty Hawk, NC
October 17	128 E. Front St.	Burlington, NC

Look for more information in the January Issue of the COC Newsletter.

- The North Carolina Association of Flood Plain Managers is sponsoring a workshop entitled **The Flood Provisions of the North Carolina Building Code**
This one-day workshop presented by the FEMA Building Science Group will present basic information needed to locate and understand the flood provisions of the North Carolina Building Code which is based on the International Code Series and ASCE 24, Flood Resistant Design and Construction. The workshop will be conducted in March on the 12th and again on the 14th.
Click here to download flyer with more details.

Engineering Division Staff News

Stephen Andrew "Andy" Miller is the new Chief Residential Code Consultant in the Interpretations Section. Andy is a professional engineer with a civil engineering degree from NC State University. Andy is also a licensed general contractor. He brings experience from his previous job where he was senior project manager for a construction company.

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The Engineering Division Staff Wish You a Merry Christmas And a Happy New Year.