North Carolina Building Code Council

Staffed by the NC Department of Insurance

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May 12, 2021

Robbie Davis, Chairman
5998 Dortches Boulevard
Rocky Mount, NC 27804

RE: Agenda for the June 8, 2021 NC Building Code Council Meeting

Mr. Davis:

This is officially to notify you and other interested parties of a regularly scheduled meeting of the NC Building Code Council. Persons requiring auxiliary services should notify the Council at least ten business days prior to the meeting.

1. The NC Building Code Council Meeting will begin at 9:00AM on Tuesday, June 8, 2021 (Albemarle Building).
2. Standing Committees will meet in the afternoon on Monday, June 7. Schedule to be set by Chairman.
3. The Agenda is printed as follows:
   A-Items- Administrative items that require Council action but are not subject to Rule-Making.
   B-Items- New amendment petitions introduced at this meeting.
   C-Items- Amendments that have been granted by the Council and advertised in the NC Register for public hearing.
   D-Items- Adoption of amendments by the Council prior to approval by the Rules Review Commission.
   E-Items- Reports from Committees and Staff.
   F-Items- Notice of Appeal Hearings.

Part A – Administrative Items

Item A – 1 Ethics Statement: Inquire upon conflicts of interest or appearance of conflicts that exist within the Council.

Item A – 2 Approval of minutes of the March 9, 2021 NC Building Code Council Meetings.

Item A – 3 Request for approval of an amendment to the fire code regulations of the Town of Wadesboro Code of Ordinances.

Item A – 4 Rules Review Commission Meeting Report

Item A – 5 Public Comments

Part B – New Petition for Rulemaking

The following Petitions for Rulemaking have been received since the last Council meeting. The Council will vote either to deny or grant these Petitions. The Council will give no further consideration to Petitions that are denied. Petitions that are granted may proceed through the Rulemaking process. The council may send any Petition to the appropriate committee. The hearing will take place during or after the June 8, 2021 meeting.

There will be no B items received from the floor.

Item B – 1 Request by Carl Martin representing the Department of Insurance to amend the NC Administrative Code, Section 204.3.5 as follows:

204.3.5 Design professional seal required. Where the General Statutes require, no permit shall be issued unless the construction documents (drawings and specifications), bear the North Carolina seal of a registered design professional. Construction documents shall include the name and address of the business entity (individual, corporation or partnership) with whom the registered design professional is affiliated. Questions concerning this section should be directed to the North Carolina Board of Architecture or the North Carolina Board of Examiners for Engineers and Land Surveyors.
Exceptions: For permitting purposes, the seal of a registered design professional is not required when the building, structure or project involved is in one of the categories listed below, unless otherwise required pursuant to the provisions of the General Statutes or the technical codes:
1. A family residence, up to eight units attached with grade-level exit, which is not a part of or physically connected with any other buildings or residential units;
2. A building upon any farm that is for the use of any farmer, unless the building is of such nature and intended for such use as to substantially involve the health or safety of the public;

3. An institutional or commercial building if it does not have a total cost of construction exceeding ~~$90,000~~ $200,000;
4. An institutional or commercial building if the total building area does not exceed ~~2,500~~ 3,000 square feet (2.32 m2) in gross floor area;
5. Alteration, remodeling or renovation of an existing building that is exempt under this section, or alteration, remodeling or renovation of an existing building or building site that does not alter or affect the structural system of the building; change the building's access or exit pattern; or change the live or dead load on the building's structural system. This subdivision shall not limit or change any other exemptions to this chapter or to the practice of engineering under Chapter 89C of the General Statutes.
6. The preparation and use of details and shop drawings, assembly or erection drawings, or graphic descriptions utilized to detail or illustrate a portion of the work required to construct the project in accordance with the plans and specifications prepared or to be prepared under the requirements or exemptions of this chapter.
7. Nothing in this ~~chapter~~ section shall be construed to prevent any individual from making plans or data for
buildings for himself or herself. This exemption does not apply to plans for places of religious
worship.
(General Statute 83A-13)

Item B – 2 Request by Carl Martin representing the Department of Insurance to amend the NC Administrative Code, Sections 106.3.1 and 106.3.2 as follows:

106.3.1 Information required. A permit application shall be filed with the Inspection Department on a form (see Appendix A) furnished for that purpose. The Inspection Department shall make available a list of information which must be submitted with the building permit application, including a complete ~~building code summary~~ Building Code Summary (see ~~Appendix A of the Administrative Code and Policies~~ Appendix B) complying with 106.3.2.
Exception: A Building Code Summary is not required if the AHJ determines plan review can be performed without the Building Code Summary.

106.3.2 Building Code Summary. The ~~Inspection Department's~~ ~~building code summary~~ Building Code Summary used by an AHJ shall be in the exact format as, and contain only the information in, Appendix B of the Administrative Code and Polices. ~~The Inspection Department~~ An AHJ shall only modify ~~its~~ the ~~building code summary~~ Building Code Summary as set forth in Section 103.5 Modifications, or as necessary to reflect any changes by the Office of State Fire Marshal to Appendix B which have been approved by the Building Code Council.

Item B – 3 Request from Phillip Ray Gibson representing the NC Radiation Protection Section, NC Radon Program, NC DHHS to amend the 2018 NC Mechanical Code, Section 512 as follows:

SECTION 512

SOIL GAS CONTROL SYSTEMS

512.1 General

The construction of soil gas control systems shall be in accordance with this section.

512.2 New construction

Where a soil gas control system is provided for new construction, the system shall conform to the requirements of ANSI-AARST CC1000.

Exception: Soil gas control systems in new one and two-family home construction shall comply with ANSI-AARST CCAH

512.3 Existing apartment buildings.

Where a soil gas control system is provided in an existing building, the system shall conformto the requirement of ANSI-AARST RMS-MF

CHAPTER 15 REFERENCED STANDARDS

AARST	AARST Consortium on National Radon Standards 527 N. Justice Street Hendersonville NC 28739 USA

ANSI/AARST CC1000 Soil Gas Control Systems in New Construction of Buildings

ANSI-AARST CCAH Reducing Radon in New Construction (Homes)

ANSI/AARST RMS-MF Radon Mitigation Standards for Multifamily Buildings

Item B – 4 Request from Brian Williams, P.E. representing Ferguson Enterprises to amend the 2018 Fuel Gas Code, Chapter 4 as follows:

403.6 Plastic pipe, tubing and fittings. Polyethene plastic pipe, tubing and fittings used to supply fuel gas shall conform to ASTM D2513. Such pipe shall be marked "Gas" and "ASTM D2513".

Crosslinked PEX-Aluminum-PEX (PEX-AL-PEX) composite pipe, tubing and fittings used to supply and or distribute fuel gas shall conform to ASTM

F1281. Such pipe shall be marked "Gas" and "ASTM F1281".
Polyvinyl chloride (PVC) and chlorinated polyvinyl chloride (CPVC) plastic pipe, tubing and fittings shall not be used to supply fuel gas.

404.3 PEX-AL-PEX PEX-AL-PEX piping systems shall be installed in the accordance with the terms of their approval, the conditions of listing, the manufacturer's instructions and this code.

404.5 Fittings in concealed locations. Fittings installed in concealed locations shall be limited to the following types:
1. Threaded elbows, tees, and couplings.
2. Brazed fittings.
3. Welded fittings.
4. Fittings listed to ANSI LC-1/CSA 6.26 or ANSI LC-4.
5. Fittings listed to be used with PEX-AL-PEX piping systems.

404.17.1 Limitations. Plastic pipe shall be installed outdoors underground only. Plastic pipe shall not be used within or under any building or slab or be operated at pressures greater than 100 psig (689 kPa) for natural gas or 30 psig (207 kPa) for LP-gas.

Exceptions:

1. PEX-AL-PEX composite piping systems when installed in accordance with section 403.6.

405.3 Plastic Pipe. Plastic pipe bends shall comply with the following:

3. The radius of the inner curve of such bends shall be ~~not less than 25 times the inside diameter of the pipe~~ in accordance with the manufacturer's instructions.

407.2 Design and installation. Piping shall be supported with ~~metal~~ pipe hooks, ~~metal~~ pipe straps, ~~metal~~ bands, ~~metal~~ brackets, ~~metal~~ hangers or building structural components, suitable for the size of piping, of adequate strength and quality, and located at intervals so as to prevent or damp out excessive vibration. Piping shall be anchored to prevent undue strains on connected appliances and shall not be supported by other piping. Pipe hangers and supports shall conform to the requirements of MSS SP-58 and shall be spaced in accordance with Section 415. Supports, hangers and anchors shall be installed so as to not interfere with the free expansion and contraction of piping between the anchors. The components of the supporting equipment shall be designed and installed so that they will not be disengaged by movement of the supported piping.

415.1 Interval of support. Piping shall be supported and intervals not exceeding the spacing specified in Table 415.1. Spacing of supports for CSST and PEX-AL-PEX shall be in accordance with the ~~CSST~~ manufacturer's

instructions.

Add to Chapter 8 - Reference Standards:
ASTM F1281-17 Standard Specification for Crosslinked Polyethylene/Aluminum/Crosslinked Polyethylene (PEX-AL-PEX) Pressure Pipe

Item B – 5 Request from Phillip Ray Gibson representing the NC Radiation Protection Section, NC Radon Program, NC DHHS to amend the 2018 NC Building Code, Chapters 12 and 35 as follows:

CHAPTER 12
INTERIOR ENVIRONMENT
SECTION 1203 VENTILATION

1203.6 Soil gas control systems.

The construction of soil gas control systems shall be in accordance with this section.

1203.6.1 New buildings.

Where a soil gas control system is provided for new construction, soil gas control systemsshall comply with ANSI-AARST CC1000.

Exception: Soil gas control systems in new one and two-family home construction shallcomply with ANSI-AARST CCAH.

1203.6.2 Existing apartment buildings.

Where a soil gas control system is provided in an existing multi-family residential structure,the system shall comply with ANSI-AARST RMS-MF.

CHAPTER 35 REFERENCED STANDARDS

AARST	AARST Consortium on National Radon Standards 527 N. Justice Street Hendersonville NC 28739 USA

ANSI/AARST RMS-CC1000 Soil Gas Control Systems in New Construction of Buildings

ANSI-AARST CCAH Reducing Radon in New Construction (Homes)

ANSI/AARST RMS-MFRadon Mitigation Standards for Multifamily Buildings

Item B – 6 Request from Phillip Ray Gibson representing the NC Radiation Protection Section, NC Radon Program, NC DHHS to amend the 2018 Residential Code, Section R328 and Chapter 44 as follows:

SECTION R328 SOIL GAS CONTROL SYSTEMS

Where a soil gas control system is installed, the system shall comply with ANSI-AARST CCAH.

Exception: Where a soil gas control system is installed in an existing residential structure, the system shall comply with ANSI-AARST SGM-SF.

CHAPTER 44
REFERENCED STANDARDS

AARST	AARST Consortium on National Radon Standards 527 N. Justice Street Hendersonville NC 28739 USA

ANSI-AARST CCAH Reducing Radon in New Construction (Homes)

ANSI/AARST SGM-SF Soil Gas Mitigation Standards for Existing Homes

Item B – 7 Request from Jeff Griffin and Bob Haynes representing the NC Building Inspector's Association to amend the 2018 NC Residential Building Code, Sections R302.2 and R313 as follows:

R302.2 Townhouses. Each *townhouse* shall be considered a separate building and shall be separated by fire-resistance rated wall assemblies meeting the requirements of Section ~~R302.1 for exterior walls.~~ R302.2.1 or R302.2.2.

~~**Exception:** If an automatic residential fire sprinkler is installed, a common 1-hour fire resistance-rated wall assembly tested in accordance with ASTM E119 or UL263 is permitted for townhouses if such walls do not contain plumbing or mechanical equipment, ducts or vents in the cavity of the common wall. The wall shall be rated for fire exposure from both sides and shall extend to and be tight against exterior wall sheathing and the underside of the roof sheathing. Electrical installations shall be installed in accordance with Section R302.4~~.

R302.2.1 Double walls. Each townhouse shall be separated by two 1-hour fire resistance-rated wall assemblies

tested in accordance with ASTM E11, UL263 or Section 703.3 of the 2018 NC Building Code.

R302.2.2 Common Walls. Common walls separating townhouses shall be assigned a fire-resistance rating in accordance with Item #1 or 2. The common wall shared by two townhouses shall be constructed shall be constructed without plumbing or mechanical equipment, ducts or vents in the cavity of the common wall. The wall shall be rated for fire exposure from both sides and shall extend to and be tight against exterior walls and the underside of the roof sheathing. Electrical installations shall be in accordance with Chapter 34 through 43. Penetrations of the membrane of common walls for electrical outlet boxes shall be in accordance with Section R302. 4.

1. Where a fire sprinkler system in accordance with Section P2904 is provided, the common wall shall be not less than a 1-hour fire-resistance-rated wall assembly tested in accordance with ASTM E119, UL 263 or Section 703.3 of the NC Building Code.
2. Where a fire sprinkle in accordance with Section P2904 is not provided, the common wall shall be not less than a 2-hour fire-restance-rated wall assembly tested in accordance with ASTM E119, UL 263 or Section 703.3 of the NC Building Code.

SECTION R313
AUTOMATIC FIRE SPRINKLER SYSTEMS

R313.1 Townhouse automatic fire sprinkler systems.

~~An automatic residential fire sprinkler system shall be installed in *townhouses*.~~

~~Exceptions:~~

~~1. Townhouses constructed with a common 2-hour fire-resistance-rated wall assembly tested in accordance with ASTM E119 or UL 263, provided such walls do not contain plumbing or mechanical equipment, ducts or vents in the cavity of the common wall. The wall shall be rated for fire exposure from both sides and shall extend to and be tight against exterior wall sheathing and the underside of the roof sheathing. Electrical installations shall be installed in accordance with the *North Carolina Electrical Code*. Penetrations for electrical outlet boxes shall be in accordance with Section R302.4.~~

~~2. An automatic residential fire sprinkler system shall not be required where *additions* or *alterations* are made to existing *townhouses* that do not have an automatic residential fire sprinkler system installed~~

Item B – 8 Request from Bob Haynes & Jeff Griffin representing the NC Building Inspectors Association to amend the 2018 NC Residential Building Code, Section Q as follows:

APPENDIX Q
TINY HOUSES

The provisions contained in this appendix are adopted as part of this code.

SECTION AQ101
GENERAL

AQ101.1 Scope. This appendix shall be applicable to *tiny houses* used as single *dwelling unit. Tiny houses* shall comply with this code except as otherwise stated in this appendix.

SECTION AQ102
DEFINITIONS

AQ102.1 General. The following words and terms shall, for the purposes of this appendix, have the meanings shown herein. Refer to Chapter 2 of this code for general definitions.

LANDING PLATFORM. A landing provided as the top step of a stairway accessing a *loft.*

HABITABLE LOFT. A floor level located more than 30 inches above the main floor and open to the main floor on one or more sides with a ceiling height of less than 6 feet 8 inches and used as a living or sleeping space.

TINY HOUSE. A *dwelling* that is 400 square feet or less in floor area excluding *lofts.*

SECTION AQ103
LOFTS

AQ103.1 General. *Lofts* used as a sleeping or living space shall meet the minimum area and dimension requirements of Sections AQ103.1.1 through AQ103.1.4.

AQ103.1.1 Minimum area. *Lofts* shall have a floor area of not less than 35 square feet.

AQ103.1.2 Minimum dimensions. *Lofts* shall be not less than 5 feet in any horizontal dimension.

AQ103.1.3 Minimum ceiling height. *Habitable space* and hallways in *tiny houses* shall have a ceiling height of not less than 6 feet 8 inches. Bathrooms, toilet rooms and kitchens shall have a ceiling height of not less than 6 feet 4 inches. Obstructions including, but not limited to, beams, girders, ducts and lighting, shall not extend below these minimum ceiling heights.

> **Exception:** Ceiling heights in *lofts* are permitted to be less than 6 feet 8 inches.

AQ104.1.4 Height effect on loft area. Portions of a *loft* with a sloped ceiling measuring less than 3 feet from the finished floor to the finished ceiling shall not be considered as contributing to the minimum required area for the loft.

Exception: Under gable roofs with a minimum slope of 6 units vertical in 12 units horizontal (50-percent slope), portions of a *loft* with a sloped ceiling measuring less than 16 inches from the finished floor to the finished ceiling shall not be considered as contributing to the minimum required area for the *loft*.

SECTION AQ104
MEANS OF EGRESS

AQ104.1 Loft access. The access to and primary egress from *lofts* shall be of any type described in Sections AQ104.2.1 through AQ104.2.4.

AQ104.2.1 Stairways. Stairways accessing *lofts* shall comply with this code or with Sections AQ104.2.1.1 through AQ104.2.1.5.

AQ104.2.1.1 Width. Stairways accessing a *loft* shall not be less than 20 inches in clear width including handrail.

AQ104.2.1.2 Headroom. The headroom in stairways accessing a *loft* shall be not less than 6 feet 2 inches, as measured vertically, from a sloped line connecting the tread or landing platform nosing in the middle of their width.

AQ104.2.1.3 Treads and risers. Risers for stairs accessing a *loft* shall be a maximum of 12 inches in height and every riser shall be uniform within a tolerance of ¾". Tread depth shall be a minimum 12" with all treads uniform within a tolerance ¾".

AQ104.2.1.4 Landing platforms. The top tread and riser of stairways accessing *lofts* shall be constructed as a *landing platform* where the *loft* ceiling height is less than 6 feet 2 inches where the stairway meets the *loft*. The *landing platform* shall be the width of the stairs with a minimum depth of 18" inches measured from the nosing of the landing platform to the edge of the *loft*, and 16 to 18 inches in height measured from the *landing platform* to the *loft* floor.

AQ104.2.1.5 Handrails. Handrails shall comply with Section R311.7.8.

AQ104.2.1.6 Stairway guards. Guards at open sides of stairways shall comply with Section R312.1.

AQ104.2.2 Ladders. Non-removable ladders accessing *lofts* shall comply with Sections AQ104.2.2.1.

Exception: Ladders that slide out of away from the loft opening that are with reach of the loft occupant.

AQ104.2.2.1 Size and capacity. Ladders accessing *lofts* shall have a rung width of not less than 12 inches, and no more than 18-inches spacing between rungs. Ladders shall be capable of supporting a 200-pound load on any rung. Rung spacing shall be uniform within 3/8 inch.

AQ104.2.3 Ship's ladders. Ship's ladders accessing *lofts* shall be installed at 70 to 80 degrees from horizontal are permitted to be used as an element of a means of egress from lofts. *Ship ladders* shall comply with Sections R311.7.12.

AQ104.2.4 Loft Guards. *Loft* guards complying with R312.1 shall be located along the open side of *lofts*. *Loft* guards shall be not less than 36 inches in height or one-half of the clear height to the ceiling, whichever is less.

SECTION AQ105
EMERGENCY ESCAPE AND RESCUE

AS105.1 Emergency Escape and Rescue. Tiny houses and their lofts shall meet the requirements of Section R310 for emergency escape and rescue openings.

SECTION AQ106
SMOKE AND CARBON MONOXIDE DETECTORS

AQ106.1 Smoke and Carbon monoxide detectors. Smoke and carbon monoxide detectors shall be installed as required in Sections R314 and R315 and just below the highest point of any loft.

SECTION AQ107
FOUNDATION

AQ107.1 Foundation options. *Tiny Houses* are permitted to be constructed without a masonry or concrete foundation per Section AQ107.1.1 and AQ107.1.2, except in *coastal high hazard, ocean hazard* and *flood hazard areas.*

AQ107.1.1 Wood Foundation. The building is supported on a wood foundation of minimum 4-inch by 4-inch or 6-inch by 6-inch mudsill or runner of approved wood in accordance with Section R317. Structural floor system which include joists and subfloor material shall also comply with Section R317, item #1.

AQ107.1.2. Anchorage. Tiny houses with wood foundations per AQ107 shall be designed and anchored to resist overturning and sliding.

Exception: Tiny houses with no more than 12' vertical mean roof height shall be anchored to resist overturning and sliding by installing a minimum of one ground anchor at each corner of the building. The total resisting force of the anchors shall be equal to 20psf (958 Pa) times the plan area of the building.

Section R202
Definitions

~~**LANDING PLATFORM.** A landing provided as the top step of a stairway accessing a loft.~~

~~**LOFT.** A floor level located more than 30 inches (762 mm) above the main floor and open to it on at least one side with a ceiling height of less than 6 feet 8 inches (2032 mm), used as a living or sleeping space.~~

R305.1 Minimum height. *Habitable space*, hallways and portions of *basements* containing these spaces shall have a ceiling height of not less than

7 feet (2134 mm). Bathrooms, toilet rooms and laundry rooms shall have a ceiling height of not less than 6 feet 8 inches (2032 mm).

Exceptions:

1. For rooms with sloped ceilings, the required floor area of the room shall have a ceiling height of not less than 5 feet (1524 mm) and not less than 50 percent of the required floor area shall have a ceiling height of not less than 7 feet (2134 mm).
2. The ceiling height above bathroom and toilet room fixtures shall be such that the fixture is capable of being used for its intended purpose. A shower or tub equipped with a showerhead shall have a ceiling height of not less than 6 feet 8 inches (2032 mm) above an area of not less than 30 inches (762 mm) by 30 inches (762 mm) at the showerhead.
3. Beams, girders, ducts or other obstructions in *habitable space* shall be permitted to project to within 6 feet 4 inches (1931 mm) of the finished floor.
4. Ceiling heights in *lofts* are permitted to be less than 6 feet 8 inches.

Section R328
Lofts

R328.1 Minimum loft area and dimensions. *Lofts* used as a sleeping or living space shall meet the minimum area and dimension requirements of Sections R328.1.1 through R328.1.4.

R328.1.1 Minimum area. *Lofts* shall have floor area of not less than 35 square feet (3.25 m2).

R328.1.2 Maximum area. *Lofts* shall have a floor area not greater than 70 square feet (6.50 m2).

R328.1.3 Minimum dimensions. *Lofts* shall not be less than 5 feet (1524 mm) in any horizontal dimension.

R328.1.4 Height effect on loft area. Portions of a *loft* with a sloping ceiling measuring less than 3 feet (914 mm) from the finished floor to the finished ceiling shall not be considered as contributing to the minimum required area for the *loft.*

Exception: Under gable roofs with a minimum slope of 6 units vertical in 12 units horizontal (50 percent slope) portions of a *loft* with a sloped ceiling measuring less than 16 inches (406 mm) from the finished floor to the finished ceiling shall not be considered as contributing to the minimum required area for the *loft.*

R328.2 Loft access. The access to and primary egress from *lofts* shall be any type described in Sections R328.2.1 through R328.2.4.

R328.2.1 Stairways. Stairways accessing *lofts* shall comply with this code or with Sections R328.2.1.1 through R328.2.1.5.

R328.2.1.1 Width. Stairways accessing a *loft* shall not be less than 17 inches (432 mm) in clear width at or above the handrail. The minimum below the handrail shall be not less than 20 inches (508 mm).

R328.2.1.2 Headroom. The headroom in stairways accessing a *loft* shall be not less than 6 feet 2 inches (1880 mm), as measured vertically, from a sloped line connecting the tread or landing platform nosings in the middle of their width.

R328.2.1.3 Treads and Risers. Risers for stairs accessing a *loft* shall be not less than 7 inches (178 mm) and not more than 12 inches (305 mm) in height. Tread depth and riser height shall be calculated in accordance with one of the following formulas:

1. The tread depth shall be 20 inches (508 mm) minus 4/3 of the riser height; or

2. The riser height shall be 15 inches (381 mm) minus ¾ of the tread depth.

R328.2.1.4 Landing platforms. The top tread and riser of stairways accessing *lofts* shall be constructed as a landing platform where the *loft* ceiling height is less than 6 feet 2 inches (1880 mm) where the stairway meets the *loft*. The landing platform shall be 18 inches to 22 inches (457 to 559 mm) in depth measured from the nosing of the landing platform to the edge of the *loft*, and 16 to 18 inches (406 to 457 mm) in height measured from the landing platform to the *loft* floor.

R328.2.1.5 Handrails. Handrails shall comply with Section R311.7.8.

R328.2.1.6 Stairway guards. Guards at open sides of stairways shall comply with Section R312.1.

R328.2.2 Ladders. Ladders accessing *lofts* shall comply with Sections R328.2.2.1 and R328.2.2.2.

R328.2.2.1 Size and capacity. Ladders accessing *lofts* shall have a rung width of not less than 12 inches (305 mm) and 10 inches (254 mm) to 14 inches (356 mm) spacing between rungs. Ladders shall be capable of supporting a 200 pound (75 kg) load on any rung. Rung spacing shall be uniform within 3/8-inch (9.5 mm).

R328.2.2.2 Incline. Ladders shall be installed at 70 to 80 degrees from horizontal.

R328.2.4 Ships ladders. Ships ladders accessing *lofts* shall comply with Sections R311.7.12.1 and R311.7.12.2. The clear width at and below handrails shall be not less than 20 inches (508 mm).

R328.2.5 Loft Guards. *Loft* guards shall be located along the open side of *lofts*. *Loft* guards shall not be less than 36 inches (914 mm) in height or one-half of the clear height to the ceiling, whichever is less.

Item B – 9 Request from Barry Gupton representing the NC Manufactured Building Division to amend the 2018 NC Residential Code, Sections 4602, 4605.5 as follow:

SECTION R4602
DEFINITIONS

COASTAL HIGH HAZARD AREA. ~~An area subject to coastal flooding and high velocity waters including storm wave wash, as shown by Federal Emergency Management Agency Maps and subject to the approval of the Building Code Council.~~

COASTAL HIGH HAZARD AREA. An area of special flood hazard extending from offshore to the inland limit of a primary frontal dune along an open coast and any other area subject to high velocity wave action from storms or seismic sources. The coastal high hazard area is identified as either V Zone or Coastal A Zone on Flood Insurance Rate Maps (FIRMs).

CORROSION RESISTANCE AREA. Areas within hurricane prone regions defined as that area east of the Intracoastal Waterway from the NC/SC state line north to Beaufort Inlet and from that point to include the barrier islands to the NC/VA state line.

OCEAN HAZARD AREA. An area, as identified by the North Carolina Coastal Resources Commission, ~~and subject to approval by the Building Code Council,~~ near the shoreline of the Atlantic Ocean that has been identified as subject to at least one of the following hazards: (A) Historical or predicted future trends of long-term erosion, (B) erosion expected to occur during a coastal storm reaching the base flood elevation, or (C) shoreline fluctuations due to tidal inlets.

SECTION R4606
FASTENER CORROSION RESISTANCE

~~R4605.5~~ R4606. Fastener corrosion resistance.
In the Coastal High Hazard Area, the Corrosion Resistance Area and the Ocean Hazard Area, all metal connectors and fasteners outside of conditioned spaces shall be hot-dip galvanized steel after fabrication and meet ASTM A 153. Exposed metal connectors, such as tie-down straps on porches, decks, and areas under the structure, shall be a minimum 3/16-inch (5 mm) thick, and shall be hot-dip galvanized after fabrication and meet ASTM A 123 or ASTM A 153. Stainless steel light-gage metal connectors shall be permitted in exposed or partially exposed locations. Metal connectors of approved equivalent corrosion-resistant material are permitted to be accepted. See Table ~~R4605.5~~ R4606.

TABLE ~~R4605.5[a]~~ R4606[a]
CORROSION RESISTANCE

	OPEN (exterior, porches, under house)	EXPOSURE LEVEL VENTED/ENCLOSED (attic, floor trusses, enclosed crawl spaces and stud cavity)	CONDITIONED (heated/cooled living areas)
Nails, staples, screws	Hot-dip galvanized	Hot-dip galvanized	-
Nuts, bolts, washers, tie rods	Hot-dip galvanized	Hot-dip galvanized	-
Steel connection plates & straps (3/16″ minimum thickness)	Hot-dip galvanized after fabrication	Hot-dip galvanized	-
Sheet metal connectors, wind anchors, joists hangers, steel joists and beams	Stainless steel or hot-dipped galvanized after fabrication	Hot-dip galvanized after plate fabrication or triple galvanized[b]	Hot-dip galvanized or triple galvanized[b]
Truss plates	Stainless steel or hot-dipped galvanized after fabrication	Hot-dip galvanized after fabrication, stainless steel, triple galvanized[b] or in accordance with TPI-1 of the Truss Plate Institute within 6′-0″ of a gable louver, ridge or soffit vent. Otherwise, standard galvanized[b].	Standard galvanized

a. Applies only to structures located in Coastal High Hazard Area, Corrosion Resistance Area and Ocean High Hazard Area.
b. Triple galvanizing – G185, standard galvanizing – G60, both per ASTM A 653 / A 653M.

(RENUMBER THE REMAINDER OF R4605.6 – R4605.8)

Part C – Notice of Rulemaking Proceedings and Public Hearing
The following Petitions for Rulemaking have been granted by the Council. Notice of Rulemaking proceedings has been made. The Public Hearing will be held on June 8, 2021 and the Final Adoption meeting may take place on or after September 14, 2021. The written public comment period expires on July 16, 2021.

Item C – 1 Request from Carl Martin representing the Department of Insurance to amend the 2018 NC Administration Code, Chapters 1, 2, and 3 as follows (210309 Item B-1)**:**

106.1 Permit required. A current permit is required for all work described in the technical codes unless specifically exempted by the North Carolina General Statutes or the technical codes.

Commentary: Reference North Carolina General ~~Statutes 153A-357 and 160A-417~~ Statute 160D-1110 for exceptions.

106.2.3 Review and approval. When the inspection department issues a permit, it shall approve, in writing or by stamp, all sets of drawings and specifications “Reviewed for Code Compliance”.

Exception: Nothing in this section shall require the review and approval of one- and two-family dwelling plans.

Commentary: Drawings and specifications shall be kept in a manner prescribed by North Carolina General ~~Statutes 153A-373 and 160A-433~~ Statute 160D-1126.

202.9.1 Engineering division. A written technical interpretation shall be provided as specified in Section ~~203.1.2.1.2~~ 203.2.1.2. Any person may appeal in writing an order, decision or determination pertaining to the code or any state building law by filing written notice with the Commissioner of Insurance or his designee within 10 days after the order, decision or determination. A copy of the appeal shall be furnished to each party.
(General Statutes 143-140, ~~153A-374 and 160A-434~~ and 160D-1127)

202.9.2.2 The Notice or Appeal shall be received no later than 30 days from the date of the decision of the State enforcement agency. (General Statute 143-141).

203.1.1.3 Buildings within primary fire limits. The Commissioner of Insurance or his or her designee shall review all permits to erect, alter, repair or move any wood-frame building or structure within the primary fire district of a municipality. Such permits shall be received and approved by the Inspection Department and approved by the Municipal Council prior to the Commissioner or his or her designee's approval.
(General ~~Statutes~~ ~~153A-375 and 160A-436~~ Statute 160D-1128)

203.2.2 Appeals. Any person may appeal in writing an order, decision or determination of a code enforcement official pertaining to the code or any state building law. The appeal shall be addressed to the Chief Engineer for the Department of Insurance by filing written notice within 10 days after the order, decision or determination. The appeal shall contain the type and size of

the building in question, the location of the building and shall reference the code sections in question. The decision shall be in writing and shall set forth the facts found. The decision rendered shall be based on the technical provisions of the code, public health and safety and shall be construed liberally to those ends. A decision shall be binding on all parties unless an appeal is submitted to the Building Code Council as specified in Section ~~201.9.2~~ 202.9.2. A copy of the appeal and written decision shall be furnished to each party.
(General ~~Statutes~~ ~~153A-374 and 160A-434~~ Statute 160D-1127)

204.1 General. The powers, duties and responsibilities of the code enforcement official are generally described in ~~the following~~ General ~~Statutes: 1. GS153A-352 for counties, and 2. GS160A-412 for cities~~ Statute 160D, Article 11.

204.2.2 Jurisdiction. A municipal inspection department shall have jurisdiction over all areas within the city limits, all extraterritorial areas that the city has jurisdiction pursuant to state laws, and over any areas in which the municipal limits have contracted with another unit of government to perform code enforcement. A county inspection department shall have jurisdiction over all unincorporated areas outside any municipal jurisdiction located within the county, all areas in which a municipality has requested the county to enforce the code, and within the jurisdiction of another unit of government in which the county has contracted to perform code enforcement. A joint inspection department created by two or more units of government shall have the authority to enforce the code in all areas of legal jurisdiction of all units of government supporting the joint department.
(General Statutes ~~153A-352 and 153A-353 for counties, and 160A-411 and 160A-413 for cities~~ 160D-1104 and 160D-1107)

204.2.3 Duties. Inspection departments shall:
1. Receive applications and supporting data for permits;
2. Issue or deny permits;
3. Make all necessary inspections to ensure code compliance;
4. Identify technical provisions found to be inconsistent with the inspection;
5. Issue or deny certificates of compliance and certificates of occupancy;
6. Issue stop work orders or orders to correct violations;
7. Maintain adequate records of permits issued or denied, inspections made, corrections ordered and certifications issued; and
8. Take other actions that may be required to adequately enforce the code.
(General ~~Statutes 153A-352 and 160A-412~~ Statute 160D-1104)

204.2.4 Code enforcement official's qualifications. No state or local government employee shall enforce any provision of the North Carolina State Building Codes who does not possess an appropriate valid certificate issued by the North Carolina Code Official's Qualification Board as specified in General Statutes 143-151.13~~, 153A-351.1 and 160A-411.1~~ and 160D-1103.

204.2.5 Conflict of interest. Information about conflict of interest for code enforcement officials can be found in General ~~Statutes 153A-355 for counties and 160A-415 for cities~~ Statute 160D-1108.

204.2.6 Right of entry. The code enforcement official shall have the right to enter buildings or premises as described in General Statutes ~~153A-360 and 153A-364 for counties, and 160A-420 and 160A-421 for cities~~ 160D-1113 and 160D-1117.

204.2.7 Stop work orders. General Statute ~~153A-361~~ 160D-404 authorizes a ~~county~~ code enforcement official to issue stop work orders. ~~General Statute 160A-421 authorizes a city code enforcement official to issue stop work orders. These statutes describe~~ The statute describes when a stop work order can be

issued, and how the stop work order is to be issued. ~~and how the stop work order may be appealed.~~ See Section 204.10 for appeal of stop work orders.

204.2.8 Unsafe building or systems. A ~~county~~ code enforcement official's authority to condemn an unsafe building is found in General Statute ~~153A-366~~ 160D-1119. ~~A city code enforcement official's authority to condemn an unsafe building is found in General Statute 160A-426~~.

204.3.1 General. No person may commence or proceed with:
1. The construction, reconstruction, alteration, repair, movement to another site, removal or demolition of any building;
2. The installation, extension or general repair of any plumbing system;
3. The installation, extension, alteration or general repair of any heating or cooling equipment system; or
4. The installation, extension, alteration or general repair of any electrical wiring, devices, appliances or equipment without first securing from the Inspection Department with jurisdiction over the site of the work each permit required by the North Carolina State Building Codes and other State or local law or local ordinance or regulation applicable to the work.
(General Statute ~~153A-357 and 160A-417~~ 160D-1110)

204.3.2 Validity. In accordance with General ~~Statutes 153A-358 for counties and 160A-418 for cities~~ Statute 160D-1111, a permit expires 6 months, or any lesser time fixed by local ordinances, after the date of issuance if the work authorized by the permit has not been commenced. If, after commencement, the work is discontinued for a period of 12 months, the permit immediately expires. No work authorized by a permit that has expired may be performed until a new permit has been issued.

204.3.6 Contractor license required. When the General Statutes require that general construction, plumbing, mechanical, electrical, fire protection or gas work be performed by an appropriately licensed individual, no permit for such type work shall be issued to an unlicensed person or firm. Additional requirements may be found in General Statutes 87-14, 87-21(e), 87-43.1, 87-58, 153A-134, ~~153A-357,~~ 160A-194 and ~~160A-417~~ 160D-1110.

204.4.1 Action on permits. In accordance with General Statute ~~153A-357 for counties and General Statute 160A-417 for cities~~ 160D-1110, the Inspection Department shall examine each application for a permit to determine if it is in compliance with the requirements of the technical codes and other pertinent laws and ordinances. If the inspection department is satisfied that the work described in the application conforms to the requirements of the technical codes and other pertinent laws and ordinances, it shall issue a permit to the applicant.

If the application does not conform to the requirements of the technical codes and other pertinent laws and ordinances, the application shall be returned to the applicant with the reasons for refusal stated.
(General Statutes ~~153A-352, 160A-412 and 160A-417~~ 160D-1104 and 160D-1110)

204.5.2 Permit intent. A permit issued shall be construed as permission to proceed with the work and not as authority to violate, cancel, alter or set aside any of the provisions of the technical codes. Issuance of a permit shall not prevent the inspection department from requiring correction of errors in plans, construction or violations of this code.
(General ~~Statutes 153A-357 and 160A-417~~ Statute 160D-1110)

204.5.3.2 Violation of code provisions. The code enforcement official may revoke a permit upon determination that the work for which the permit was issued is in violation of, or not in conformity with, the provisions of this or the technical codes.
(General Statute ~~153A-362, 160A-422~~ 160D-1115)

204.6.1 Fees. A permit shall not be issued until the fees prescribed by the local governing authority have been paid. No amendment to a permit shall be released until the additional fee, if any, has been paid.
(General ~~Statutes 153A-354 and 160A-414~~ Statute 160D-402)

204.6.2 Work commencing before permit issuance. If any person commences any work on a building or service systems before obtaining the necessary permit, he or she shall be subject to a penalty as established by the local governing body.
(General ~~Statutes 153A-354 and 160A-414~~ Statute 160D-402)

204.7.1 Periodic inspections for hazardous or unlawful conditions. The inspection department shall make periodic inspections as specified in General ~~Statutes 153A-364 for counties and 160A-424 for cities~~ Statute 160D-1117.

204.8.1 Building occupancy. A new building shall not be occupied, or a change made in the occupancy, nature or use of a building or part of a building until after the inspection department has issued a certificate of compliance. The certificate of compliance shall not be issued until all required service systems have been inspected for compliance with the technical codes and other applicable laws and ordinances and released by the inspection department.
(General ~~Statutes 153A-363 and 160A-423~~ Statute 160D-1116)

204.8.2 Certificate of compliance. Upon satisfactory completion of a building, plumbing, mechanical, electrical, fire protection or gas system, or portion thereof, a certificate of compliance shall be issued. The certificate of

compliance represents that a structure or system is complete and for certain types of permits is permission granted for connection to a utility system. The certificate of compliance shall not be construed to grant authority to occupy a building.
(General ~~Statutes 153A-363 and 160A-423~~ Statute 160D-1116)

204.8.3 Temporary/partial occupancy. A temporary/partial certificate of compliance may be issued permitting occupancy for a stated period for specific portions of a building or service system that the inspector finds safe for occupancy prior to final completion of the entire building or system.
(General ~~Statutes 153A-363 and 160A-423~~ Statute 160D-1116)

204.9.2 Temporary connection. The inspection department may authorize the temporary connection of the building or system to the utility source of energy, fuel or power for the purpose of testing building service systems.
(General ~~Statutes 153A-363 and 160A-423~~ Statute 160D-1116)

204.10 Appeal of stop ~~Stop~~ work orders. Whenever a stop order has been issued by an inspection department involving alleged violations of the State Building Codes, the owner or builder may appeal in writing to the Commissioner of Insurance, or his or her designee, within 5 days after the date the order is issued, with a copy of the appeal to the inspection department. No further work may take place in violation of a stop order. The Commissioner, or his or her designee, shall promptly conduct an investigation. The inspection department and the owner or builder shall be permitted to submit relevant evidence for the investigation. The Commissioner of Insurance, or his or her designee, shall provide a written statement of the decision setting forth the facts found, the decision reached and the reasons for the decision. In the event of dissatisfaction with the decision, the person affected shall have the option of appealing as set forth in Section 203.1.2.
(General ~~Statutes 153A-361 and 160A-421~~ Statute 160D-1114)

204.14 Code enforcement official not fulfilling responsibilities. When the code enforcement official does not fulfill his responsibilities as specified in Section 204.13, the Commissioner of Insurance or his designee may institute any appropriate actions or proceedings available.
(General Statutes 14-230, 14-231, 14-232, ~~153A-356 and 160A-41~~ 160D-1109)

CHAPTER 3 REPRINT OF THE GENERAL STATUTES PERTAINING TO THE ENFORCEMENT OF THE NORTH CAROLINA STATE BUILDING CODE

The North Carolina State Building Codes do not include all additional requirements for buildings and structures that may be imposed by other State agencies, occupational licensing boards and commissions. It shall be the responsibility of a permit holder, design professional, contractor or

occupational license holder to determine whether any additional requirements exist.

The current language of the General Statutes may be viewed at www.ncleg.gov.

The following list, while extensive, may not include all applicable General Statutes.

1-539.2 Dismantling portion of building
14-68 Failure of owner of property to comply with orders of public authorities
14-228–232 Misconduct in public office
14-414 Pyrotechnics defined; exceptions
15-27.2 Administrative search and inspection warrants

42 Article 5 Landlord Tenant
58-2-95 Commissioner to supervise local inspectors
58-31-40 Commissioner to inspect state property; plans submitted
58-79-20 Inspection of premises; dangerous material removed
66-23–27 Electrical materials, devices, appliances and equipment
83A-1–13 Architects
87-1–15 General contractors
87-21 Plumbing, heating and fire sprinkler contractor
87-43 Electrical contractors
87-57–58 Refrigeration contractors
89C-3–23 Engineers
95-69 Uniform boiler and pressure vessel act
105-130–151 Accessibility tax credit
106-581.1 Agriculture Defined
115C-525 Public schools
119 Article 5 Liquefied petroleum gases
130A-336–339 Wastewater system construction
133-1–4 Public works
143-135.1 Inspection of state owned buildings
143-136–143 Building Code Council and Building Code
143-141 Appeals to Building Code Council
143-151.8–21 Code officials qualification board
143-151.42 Prohibition of master meters for electric and natural gas service
143-151.43–64 North Carolina home inspector board
150B-18–21 Administrative Procedures Act
~~153A-97–375 Counties~~
~~160A-167–438 Cities~~
160D Article 11 Building Code Enforcement

APPENDIX E
APPEALS
NORTH CAROLINA
BUILDING CODE COUNCIL

325 North Salisbury Street, Room 5_44
Raleigh, North Carolina 27603
(919) 647-0009

APPEAL TO NCDOI/NCBCC Hearing Date_____/_____/_____

GS ~~153A-374, GS 160A-434~~ 160D-1127 GS 143-140, GS 143-141
Formal Interpretation by NCDOI ____ Appeal of Local Decision to NCBCC _____
Appeal of Local Decision to NCDOI ____ Appeal of NCDOI Decision to NCBCC _____

APPELANT _____ PHONE: (___) ___ - _____ x _____
REPRESENTING: _____
ADDRESS: _____
CITY: _____ STATE: _____ ZIP: _____
E-MAIL: _____ FAX: (___) ___ - _____

North Carolina State Building Code, Volume _____ - Section _____

REQUEST ONE: [ ] 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.

REASON:

Signature: _____ Date: _____

Item C – 2 Request from Wayne Hamilton representing the NC Building Code Council Tent Ad-hoc Committee to amend the 2018 NC Fire Code, Section 3103.4 as follows (210309 Item B-3)**:**

3103.4 Permits. Permits shall be required as set forth in Sections 105.6 and 105.7. The *fire code official* shall refer the permit applicant to the appropriate agency for other applicable occupational licensing or construction permitting requirements.

Item C – 3 Request from Bryan Dale Robinson representing the City of Raleigh to amend the 2018 NC Building Code as follows (210309 Item B-5)**:**

1004.2 Increased Occupant Load – Where approved by the Building Official, the *occupant load* permitted in any building, or portion thereof, is permitted to be increased from the number established for the occupancies in Table 1004.1.2, provided that all other requirements of the code are met based on such modified number and the occupant load does not exceed one occupant per 7 square feet (0.65 m^2) of occupiable floor space. Where required by the *building official*, an *approved aisle*, seating or fixed equipment diagram substantiating any increase in *occupant load* shall be submitted. Where required by the *building official*, such diagram shall be posted.

Item C – 4 Request from Drew Crawford representing DIYtiny, INC to add to the 2018 NC Building Code, Sections 101.2.6 and amend Section 202 as follows (210309 Item B-6**):**

101.2.6 A *Tiny House* shall be constructed in accordance with the *International Residential Code* and shall be separated in accordance with Table 602.

Section 202
Definitions
TINY HOUSE. A detached single-family dwelling that is 400 square feet (37 m^2) or less in floor area, excluding lofts.

Item C – 5 Request from Drew Crawford representing DIYtiny, INC to amend the 2018 NC Residential Building Code, Sections R202, R305, R328 as follows (210309 Item B-7)**:**

Section R202
Definitions
TINY HOUSE A detached single-family *dwelling* that is 400 square feet (37 m^2) or less in floor area excluding lofts.

R305.1 Minimum height. *Habitable space*, hallways and portions of *basements* containing these spaces shall have a ceiling height of not less than 7 feet (2134 mm). Bathrooms, toilet rooms and laundry rooms shall have a ceiling height of not less than 6 feet 8 inches (2032 mm).
Exceptions:
1. For rooms with sloped ceilings, the required floor area of the room shall have a ceiling height of not less than 5 feet (1524 mm) and not less than 50 percent of the required floor area shall have a ceiling height of not less than 7 feet (2134 mm).
2. The ceiling height above bathroom and toilet room fixtures shall be such that the fixture is capable of being used for its intended purpose. A shower or tub equipped with a showerhead shall have a ceiling height of not less than 6 feet 8 inches (2032 mm) above an area of not less than 30 inches (762 mm) by 30 inches (762 mm) at the showerhead.
3. Beams, girders, ducts or other obstructions in *habitable space* shall be permitted to project to within 6 feet 4 inches (1931 mm) of the finished floor.
4. Ceiling heights in lofts are permitted to be less than 6 feet 8 inches.
5. Kitchens shall have a ceiling height of not less than 6 feet 8 inches in a *tiny house.*

R328.1.2 Maximum area. *Lofts* shall have a floor area not greater than ~~70~~ 100 square feet (~~6.50~~ 9.29 m^2).

R328.1.3 Minimum horizontal dimensions. *Lofts* shall not be less than 5 feet (1524 mm) in any horizontal dimension.

R328.2 Loft access and egress. The access to and primary egress from *lofts* shall be any type described in Sections R328.2.1 through R328.2.4. The *loft* access and egress elements along its required minimum width, shall meet the *loft* where its ceiling height is not less than 3 feet (914mm).

R328.2.1.2 Headroom. The headroom ~~in~~ above *stairways* accessing a *loft* shall be not less than 6 feet 2 inches (1880 mm), as measured vertically, from a sloped line connecting the tread, ~~or~~ landing, or landing platform nosings in the ~~middle~~ center of their width, and vertically from the landing platform along the center of its width.

R328.2.1.4 Landings. Intermediate landings and landings at the bottom of *stairways* shall comply with Section R311.7.6, except that the depth in the direction of travel shall be not less than 24 inches (610 mm).

~~R328.2.1.4~~ R328.2.1.5 Landing platforms. The top tread and riser of stairways accessing *lofts* shall be constructed as a landing platform where the *loft* ceiling height is less than 6 feet 2 inches (1880 mm) where the *stairway*

meets the loft. The landing platform shall be ~~18 inches to 22 inches (457 to 559)~~ not less than 20 inches (508 mm) in width and in depth measured horizontally from and perpendicular to the nosing of the landing platform. The landing platform riser height to ~~the edge of~~ the *loft*~~, and 16 to~~ floor shall be not less than 16 inches (406 mm) and not greater than 18 inches ~~(406 to~~ 457 mm) ~~in height measured from the landing platform to the loft floor~~.

~~R328.2.1.5~~ R328.2.1.6 Handrails. *Handrails* shall comply with Section R311.7.8.

~~R328.2.1.6~~ R328.2.1.7 Stairway guards. *Guards* at open sides of *stairways*, landings and landing platforms shall comply with Section R312.1.

R328.2.2.1 Size and capacity. Ladders accessing lofts shall have a rung width of not less than 12 inches (305 mm) and 10 inches (254 mm) to 14 inches (356 mm) spacing between rungs. Ladders shall be capable of supporting a ~~200~~ 300 pound (~~75~~ 136 kg) load on any rung. Rung spacing shall be uniform within 3/8-inch (9.5 mm).

R328.2.5 Loft Guards. *Loft guards* shall be located along the open ~~side~~ sides of *lofts*. *Loft guards* shall not be less than 36 inches (914 mm) in height or one-half of the clear height to the ceiling, whichever is less. *Loft guards* shall comply with Section R312.1.3 and Table R301.5 for their components.

Item C – 6 **Request from Kerry Sutton representing American Concrete Institute (ACI), Dave Tepke representing ACI Carolinas Chapter, Mark LeMay representing International Concrete Repair Institute (ICRI), Bill Brickey representing ICRI Carolinas Chapter, Keith Kesner representing CVM, Tim Cooke representing SKA Consulting Engineering, and Douglas Allen representing Simpson Strong-Tie to add to the 2018 NC Existing Building Code, Section 606.1.1 and to amend Chapter 16 as follows** (210309 Item B-9)**:**

606.1.1 Repairs to structural concrete. Repairs to structural concrete elements in accordance with ACI 562 shall be permitted.
Exception:
1. Where seismic design governs. ACI 562 shall not be used for evaluation and design.
2. Dwellings and accessory buildings constructed under the NC Residential Code.

Add new referenced standard to Chapter 16 as follows:

Chapter 16

ACI American Concrete Institute 38800 Country Club Drive Farmington Hills, MI 48331

562-16: Code Requirements for Assessment, Repair, and Rehabilitation of Existing Concrete Structures

606.1.1

Part D – Final Adoption

The following Petitions for Rulemaking have been granted by the Council. Notice of Rulemaking proceedings and Public Hearing has been made. The Public Hearings were held on March 9, 2021. The Final Adoption meeting will take place on June 8, 2021. The Council will give no further consideration to Petitions that are disapproved. Petitions that are approved will proceed through the Rulemaking process. The effective date is January 1, 2022 unless otherwise noted.

Item D – 1 Request from Julius Ballanco representing JB Engineering and Code Consulting, P.C. to amend the 2018 Residential Code, Chapter 44 as follows (200901 Item B-8)**:**

CHAPTER 44
REFERENCED STANDARDS

~~ANCE~~

~~UL/CSA/ANCE 60335-2-40—2012 Standard for Household and Similar Electrical Appliances, Part 2: Particular Requirements for Motor-compressors M1403.1~~

ASHRAE

34—~~2013~~2019 Designation and Safety Classification of Refrigerants M1411.1

CSA

CSA C22.2 No. 60335-2-40-2019

~~UL/CSA/ANCE 60335-2-40—2012~~ Standard for Household and Similar Electrical Appliances, Part 2-40: Particular Requirements for ~~Motor-compressors~~ Electrical Heat Pumps, Air-Conditioners and Dehumidifiers - 3rd Edition M1402.1, M1403.1

UL

1995—~~2011~~2015 Heating and Cooling Equipment M1402.1, M1403.1, M1407.1

~~UL/CSA/ANCE~~ 60335-2-40-~~2012~~2019 Standard for Household and Similar Electrical Appliances, Part 2-40: Particular Requirements for ~~Motor-compressors~~ Electrical Heat

Pumps, Air-Conditioners and Dehumidifiers – 3rd Edition
M1402.1, M1403.1

Item D – 2 Request from Julius Ballanco representing JB Engineering and Code Consulting, P.C./Daikin U.S. to amend the 2018 Residential Code, Section M1402.1 as follows (200901 Item B-9)**:**

M1402.1 (918.1) General.
Oil-fired central furnaces shall conform to ANSI/UL 727. Electric furnaces

shall conform to UL 1995 or UL/CSA 60335-2-40. Solid fuel furnaces shall be tested in accordance with UL 391.

Item D – 3 Request from Julius Ballanco representing JB Engineering and Code Consulting, P.C./Daikin U.S. to amend the 2018 Residential Code, Section M1403.1 as follows (200901 Item B-10)**:**

M1403.1 (918.2) Heat pumps.
Electric heat pumps shall be listed and labeled in accordance with UL 1995 or UL/CSA~~/ANCE~~ 60335-2-40.

Item D – 4 Request from Julius Ballanco representing JB Engineering and Code Consulting, P.C./Daikin U.S. to amend the 2018 Mechanical Code, Chapter 15 as follows (200901 Item B-11)**:**

CHAPTER 15
REFERENCED STANDARDS

Standard reference number	Title
ASHRAE	ASHRAE 1791 Tullie Circle, NE Atlanta, GA 30329
15—~~2013~~2019	Safety Standard for Refrigeration Systems 1101.6, 1105.8, 1108.1
34—~~2013~~2019	Designation and Safety Classification of Refrigerants 202, 1102.2.1, 1103.1
CSA	CSA Group 8501 East Pleasant Valley Road Cleveland, OH 44131-5516
CSA-C22.2 No. 60335-2-40-2019	Household And Similar Electrical Appliances - Safety - Part 2-40: Particular Requirements for Electrical Heat Pumps,

	Air-Conditioners and Dehumidifiers – 3rd Edition 908.1, 918.1, 918.2, 1101.2
UL	UL LLC 333 Pfingsten Road Northbrook, IL 60062-2096
1995—~~2011~~2015	Heating and Cooling Equipment 908.1, 911.1, 918.1, 918.2, 1101.2
UL 60335-2-40-2019	Household And Similar Electrical Appliances - Safety - Part 2-40: Particular Requirements for Electrical Heat Pumps, Air-Conditioners and Dehumidifiers – 3rd Edition 908.1, 918.1, 918.2, 1101.2

Item D – 5 Request from Julius Ballanco representing JB Engineering and Code Consulting, P.C./Daikin U.S. to amend the 2018 Mechanical Code, Section 908.1 as follows (200901 Item B-12)**:**

908.1 General.
A cooling tower used in conjunction with an air-conditioning appliance shall be installed in accordance with the manufacturer's instructions. Factory-built cooling towers shall be listed in accordance with UL 1995 or UL/CSA 60335-2-40.

Item D – 6 Request from Julius Ballanco representing JB Engineering and Code Consulting, P.C./Daikin U.S. to amend the 2018 Mechanical Code, Sections 918.1 and 918.2 as follows (200901 Item B-13)**:**

918.1 Forced-air furnaces.
Oil-fired furnaces shall be tested in accordance with UL 727. Electric furnaces shall be tested in accordance with UL 1995 or UL/CSA 60335-2-40. Solid fuel furnaces shall be tested in accordance with UL 391. Forced-air furnaces shall be installed in accordance with the listings and the manufacturer's instructions.

918.2 Heat pumps.
Electric heat pumps shall be tested in accordance with UL 1995 or UL/CSA 60335-2-40.

Item D – 7 Request from Julius Ballanco representing JB Engineering and Code Consulting, P.C./Daikin U.S. to amend the 2018 Mechanical Code, Section 1101 as follows (200901 Item B-14)**:**

1101.2 Factory-built equipment and appliances.
Listed and labeled self-contained, factory-built equipment and appliances shall be tested in accordance with UL 207, 412, 471, ~~or~~ 1995 or UL/CSA 60335-2-40. Such equipment and appliances are deemed to meet the design, manufacture and factory test requirements of this code if installed in accordance with their listing and the manufacturer's instructions.

Item D – 8 Request from Robert Privott representing N.C. Home Builders Association and Jeff Tiller to amend the 2018 Energy Code, Section R406.2 as follows (200901 Item B-15)**:**

R406.2 Mandatory requirements.
Compliance with this section requires that the provisions identified in Sections R401 through R404 labeled as "mandatory" be met. The building thermal envelope shall be greater than or equal to levels of efficiency and Solar Heat Gain Coefficient in Table R406.2.1 or Table R406.2.2. ~~Table 402.1.1 or 402.1.3 of the 2012 North Carolina Energy Conservation Code.~~ Minimum standards associated with compliance shall be the ANSI RESNET
ICC Standard 301-2014: "Standard for the Calculation and Labeling of the Energy Performance of Low-Rise Residential Buildings using an Energy Rating Index." A North Carolina *registered design professional* or certified *HERS rater* is required to perform the analysis if required by North Carolina Licensure laws.

Exception: Supply and return ducts in unconditioned space and outdoors shall be insulated to a minimum R-8. Supply ducts inside semi-conditioned space shall be insulated to a minimum R-4; return ducts inside conditioned

and semi-conditioned space are not required to be insulated. Ducts located inside conditioned space are not required to be insulated other than as may be necessary for preventing the formation of condensation on the exterior of cooling ducts.

TABLE R406.2.1
MINIMUM INSULATION AND FENESTRATION REQUIREMENTS FOR ENERGY RATING INDEX COMPLIANCE[a]

	FENESTRATION VALUES			R-VALUES FOR								
CLIMATE ZONE	FENESTRATION U-FACTOR[b,j]	SKYLIGHT[b] U-FACTOR	GLAZED FENESTRATION SHGC[b,k]	CEILING[m]	UNVENTED[p] RAFTER ASSEMBLIES IN ATTICS CONTAINING DUCTWORK, AIR-IMPERMEABLE	UNVENTED[p] RAFTER ASSEMBLIES IN ATTICS CONTAINING DUCTWORK, AIR-PERMIABLE/ IMPERMEABLE	WOOD FRAME WALL	MASS WALL[l]	FLOOR	BASEMENT[c,o] WALL	SLAB[d]	CRAWL SPACE[c] WALL
3	0.35	0.65	0.3	30	20	15-10[q]	13	5/10	19	10/13[f]	0	5/13
4	0.35	0.6	0.3	38 or 30ci[l]	20	15-10[q]	15, 13+2.5[h]	5/10	19	10/13	10	10/13
5	0.35	0.6	NR	38 or 30ci[l]	25	15-20[q]	19[n], 13+5[h], or 15+3[h]	13/17	30[g]	10/13	10	10/13

For SI: 1 foot = 304.8 mm.
a. *R*-values are minimums. *U*-factors and SHGC are maximums.
b. The fenestration *U*-factor column excludes skylights. The SHGC column applies to all glazed fenestration.
c. "10/13" means R-10 continuous insulated sheathing on the interior or exterior of the home or R-13 cavity insulation at the interior of the basement wall or crawl space wall.
d. For monolithic slabs, insulation shall be applied from the inspection gap downward to the bottom of the footing or a maximum of 18 inches below grade whichever is less. For floating slabs, insulation shall extend to the bottom of the foundation wall or 24 inches, whichever is less. (See Appendix R2) R-5 shall be added to the required slab edge *R*-values for heated slabs.
e.- Deleted.
f. Basement wall insulation is not required in warm-humid locations as defined by Figure R301.1 and Table R301.1.
g. Or insulation sufficient to fill the framing cavity, R-19 minimum.
h. The first value is cavity insulation, the second value is continuous insulation so "13+5" means R-13 cavity insulation plus R-5 continuous insulation. If structural sheathing covers 25 percent or less of the exterior, insulating sheathing is not required where structural sheathing is used. If structural sheathing covers more than 25 percent of exterior, structural sheathing shall be supplemented with insulated sheathing of at least R-2.
i. The second *R*-value applies when more than half the insulation is on the interior of the mass wall.
j. In addition to the exemption in R402.3.3, a maximum of two glazed fenestration product assemblies having a U-factor no greater than 0.55 shall be permitted to be substituted for minimum code compliant fenestration product assemblies without penalty.
k. In addition to the exemption in R402.3.3, a maximum of two glazed fenestration product assemblies having a SHGC no greater than 0.70 shall be permitted to be substituted for minimum code compliant fenestration product assemblies without penalty.
l. R-30 shall be deemed to satisfy the ceiling insulation requirement wherever the full height of uncompressed R-30 insulation extends over the wall top plate at the eaves. Otherwise, R-38 insulation is required where adequate clearance exists or insulation must extend either to the insulation baffle or within 1" of the attic roof deck.
m. Table value required except for roof edge where the space is limited by the pitch of the roof; there the insulation must fill the space up to the air baffle.
n. R -19 fiberglass batts compressed and installed in a nominal 2 × 6 framing cavity is deemed to comply. Fiberglass batts rated R-19 or higher compressed and installed in a 2x4 wall ~~is~~ are not deemed to comply.
o. Basement wall meeting the minimum mass wall specific heat content requirement may use the mass wall R-value as the minimum requirement.
p. The air-impermeable insulation shall meet the requirements of the definition in Section R202. Air-impermeable insulation shall be installed in direct contact with the underside of the structural roof sheathing. For one- and two-family dwellings and townhouses, the insulation installation shall meet the requirements of R806.5 of the North Carolina Residential Code. For Residential Buildings other than one- and two-family dwellings and townhouses, the insulation installation shall meet the installation requirements of 1203.3 of the North Carolina Building Code. Exposed rafters shall be covered with R-7 insulation.
q. The value for air-permeable insulation is shown first and that for air-impermeable insulation second. Thus, R-15 + R-10 indicates that the minimum value for air-permeable insulation is R-15, and the minimum value for air-impermeable insulation is R-10. Air-impermeable insulation shall be installed in direct contact with the underside of the structural roof sheathing. The air-permeable insulation shall be installed directly under the air-impermeable insulation. Exposed rafters shall be covered with R-7 insulation.

TABLE R406.2.2
EQUIVALENT U-FACTORS FOR TABLE R406.2.1

CLIMATE ZONE	FENESTRATION [d]	SKYLIGHT	CEILING	UNVENTED [e] RAFTER ASSEMBLIES IN ATTICS CONTAINING DUCTWORK, AIR-IMPERMEABLE	UNVENTED [e] RAFTER ASSEMBLIES IN ATTICS CONTAINING DUCTWORK/, AIR-PERMEABLE/ IMPERMEABLE	FRAME WALL	MASS WALL [b]	FLOOR	BASEMENT [d] WALL	CRAWL SPACE [c] WALL
3	0.35	0.65	0.0350	0.05	0.043[f]	0.082	0.141	0.047	0.059	0.136
4	0.35	0.60	0.0300	0.05	0.043[f]	0.077	0.141	0.047	0.059	0.065
5	0.35	0.60	0.0300	0.037	0.034[f]	0.061	0.082	0.033	0.059	0.065

a. Nonfenestration *U*-factors shall be obtained from measurement, calculation or an approved source.
b. When more than half the insulation is on the interior, the mass wall *U*-factors shall be a maximum of 0.07 in Climate Zone 3, 0.07 in Climate Zone 4 and 0.054 in Climate Zone 5.
c. Basement wall *U*-factor of 0.360 in warm-humid locations as defined by Figure R301.1 and Table R301.1.
d. A maximum of two glazed fenestration product assemblies having a U-factor no greater than 0.55 and a SHGC no greater than 0.70 shall be permitted to be substituted for minimum code compliant fenestration product assemblies without penalty. When applying this note and using the RESCheck "UA Trade-off" compliance method to allow continued use of the software, the applicable fenestration products shall be modeled as meeting the U-factor of 0.35 and the SHGC of 0.30, as applicable, but the fenestration products' actual U-factor and actual SHGC shall be noted in the comments section of the software for documentation of application of this note to the applicable products. Compliance for these substitute products shall be verified compared to the allowed substituted maximum U-value requirement and maximum SHGC requirement, as applicable.
e. The air-impermeable insulation shall meet the requirements of the definition in section R202. Air-impermeable insulation shall be installed in direct contact with the underside of the structural roof sheathing. For one- and two-family dwellings and townhouses, the insulation installation shall meet the requirements of R806.5 of the North Carolina Residential Code. Exposed rafters shall be covered with R-7 insulation.

f. For air-permeable/ impermeable applications, Table R406.2.1 shall be followed for minimum insulation values.

The fiscal note for this item can be viewed online at: https://www.ncosfm.gov/bcc-agenda-2020-09-01-fiscal-note-items-b15-and-b21pdf.

Item D – 9 Request from Robert Privott representing N.C. Home Builders Association and Jeff Tiller to add the 2018 N.C. Energy Code, Chapter 2 Definitions as follows (200901 Item B-20)**:**

AIR-IMPERMEABLE INSULATION. An insulation having an air permanence equal to or less than 0.02 L/s-m2 at 75 Pa pressure differential tested according to ASTM E2178 or E283 at the thickness applied.

Item D – 10 Request from Robert Privott representing N.C. Home Builders Association and Jeff Tiller to amend the 2018 N.C. Residential Code, Section N1106.2 Mandatory Requirements as follows (200901 Item B-21)**:**

N1106.2 Mandatory requirements.
Compliance with this section requires that the provisions identified in Sections N1101 through N1104 labeled as "mandatory" be met. The building thermal envelope shall be greater than or equal to levels of efficiency and Solar Heat Gain Coefficient in Table N1106.2.1 or Table N1106.2.2. ~~Table 402.2.3 or 402.1.3 of the 2012 North Carolina Energy Conservation Code.~~ Minimum standards associated with compliance shall be the ANSI RESNET ICC Standard 301-2014: "Standard for the Calculation and Labeling of the Energy Performance of Low-Rise Residential Buildings using an Energy Rating Index." A North Carolina *registered design professional* or certified *HERS rater* is required to perform the analysis if required by North Carolina Licensure laws.

Exception: Supply and return ducts in unconditioned space and outdoors shall be insulated to a minimum R-8. Supply ducts inside semi-conditioned space shall be insulated to a minimum R-4; return ducts inside conditioned and semi-conditioned space are not required to be insulated. Ducts located inside conditioned space are not required to be insulated other than as may be necessary for preventing the formation of condensation on the exterior of cooling ducts.

TABLE N1106.2.1
MINIMUM INSULATION AND FENESTRATION REQUIREMENTS FOR ENERGY RATING INDEX COMPLIANCE[a]

	FENESTRATION VALUES			R-VALUES FOR								
CLIMATE ZONE	FENESTRATION U-FACTOR[b,j]	SKYLIGHT[b] U-FACTOR	GLAZED FENESTRATION SHGC[b,k]	CEILING[m]	UNVENTED[p] RAFTER ASSEMBLIES IN ATTICS CONTAINING DUCTWORK, AIR-IMPERMEABLE	UNVENTED[p] RAFTER ASSEMBLIES IN ATTICS CONTAINING DUCTWORK, AIR-PERMIABLE/ IMPERMEABLE	WOOD FRAME WALL	MASS WALL[l]	FLOOR	BASEMENT[c,o] WALL	SLAB[d]	CRAWL SPACE[c] WALL
3	0.35	0.65	0.3	30	20	15-10[q]	13	5/10	19	10/13[f]	0	5/13
4	0.35	0.6	0.3	38 or 30ci[l]	20	15-10[q]	15, 13+2.5[h]	5/10	19	10/13	10	10/13
5	0.35	0.6	NR	38 or 30ci[l]	25	15-20[q]	19[n], 13+5[h], or 15+3[h]	13/17	30[g]	10/13	10	10/13

For SI: 1 foot = 304.8 mm.

a. *R*-values are minimums. *U*-factors and SHGC are maximums.

b. The fenestration *U*-factor column excludes skylights. The SHGC column applies to all glazed fenestration.

c. "10/13" means R-10 continuous insulated sheathing on the interior or exterior of the home or R-13 cavity insulation at the interior of the basement wall or crawl space wall.

d. For monolithic slabs, insulation shall be applied from the inspection gap downward to the bottom of the footing or a maximum of 18 inches below grade whichever is less. For floating slabs, insulation shall extend to the bottom of the foundation wall or 24 inches, whichever is less. (See Appendix O) R-5 shall be added to the required slab edge *R*-values for heated slabs.

e.- Deleted.

f. Basement wall insulation is not required in warm-humid locations as defined by Figure N1101.7 and Table N1101.7.

g. Or insulation sufficient to fill the framing cavity, R-19 minimum.

h. The first value is cavity insulation, the second value is continuous insulation so "13+5" means R-13 cavity insulation plus R-5 continuous insulation. If structural sheathing covers 25 percent or less of the exterior, insulating sheathing is not required where structural sheathing is used. If structural sheathing covers more than 25 percent of exterior, structural sheathing shall be supplemented with insulated sheathing of at least R-2.

i. The second *R*-value applies when more than half the insulation is on the interior of the mass wall.

j. In addition to the exemption in N1102.3.3, a maximum of two glazed fenestration product assemblies having a U-factor no greater than 0.55 shall be permitted to be substituted for minimum code compliant fenestration product assemblies without penalty.

k. In addition to the exemption in N1102.3.3, a maximum of two glazed fenestration product assemblies having a SHGC no greater than 0.70 shall be permitted to be substituted for minimum code compliant fenestration product assemblies without penalty.

l. R-30 shall be deemed to satisfy the ceiling insulation requirement wherever the full height of uncompressed R-30 insulation extends over the wall top plate at the eaves. Otherwise, R-38 insulation is required where adequate clearance exists or insulation must extend either to the insulation baffle or within 1" of the attic roof deck.

m. Table value required except for roof edge where the space is limited by the pitch of the roof; there the insulation must fill the space up to the air baffle.

n. R -19 fiberglass batts compressed and installed in a nominal 2 × 6 framing cavity is deemed to comply. Fiberglass batts rated R-19 or higher compressed and installed in a 2x4 wall ~~is~~ are not deemed to comply.

o. Basement wall meeting the minimum mass wall specific heat content requirement may use the mass wall R-value as the minimum requirement.

p. The air-impermeable insulation shall meet the requirements of the definition in Section R202. Air-impermeable insulation shall be installed in direct contact with the underside of the structural roof sheathing. For one- and two-family dwellings and townhouses, the insulation installation shall meet the requirements of R806.5 of the North Carolina Residential Code. For Residential Buildings other than one- and two-family dwellings and townhouses, the insulation installation shall meet the installation requirements of 1203.3 of the North Carolina Building Code. Exposed rafters shall be covered with R-7 insulation.

g. The value for air-permeable insulation is shown first and that for air-impermeable insulation second. Thus, R-15 + R-10 indicates that the minimum value for air-permeable insulation is R-15, and the minimum value for air-impermeable insulation is R-10. Air-impermeable insulation shall be installed in direct contact with the underside of the structural roof sheathing. The air-permeable insulation shall be installed directly under the air-impermeable insulation. Exposed rafters shall be covered with R-7 insulation.

TABLE N1106.2.2
EQUIVALENT U-FACTORS FOR TABLE N1106.2.1[a]

CLIMATE ZONE	FENESTRATION[d]	SKYLIGHT	CEILING	UNVENTED[e] RAFTER ASSEMBLIES IN ATTICS CONTAINING DUCTWORK, AIR-IMPERMEABLE	UNVENTED[e] RAFTER ASSEMBLIES IN ATTICS CONTAINING DUCTWORK, AIR-PERMIABLE/ IMPERMEABLE	FRAME WALL	MASS WALL[b]	FLOOR	BASEMENT[d] WALL	CRAWL SPACE[c] WALL
3	0.35	0.65	0.0350	0.05	0.043[f]	0.082	0.141	0.047	0.059	0.136
4	0.35	0.60	0.0300	0.05	0.043[f]	0.077	0.141	0.047	0.059	0.065
5	0.35	0.60	0.0300	0.037	0.034[f]	0.061	0.082	0.033	0.059	0.065

a. Nonfenestration *U*-factors shall be obtained from measurement, calculation or an approved source.

b. When more than half the insulation is on the interior, the mass wall *U*-factors shall be a maximum of 0.07 in Climate Zone 3, 0.07 in Climate Zone 4 and 0.054 in Climate Zone 5.

c. Basement wall *U*-factor of 0.360 in warm-humid locations as defined by Figure N1101.7 and Table N1101.7.

d. A maximum of two glazed fenestration product assemblies having a U-factor no greater than 0.55 and a SHGC no greater than 0.70 shall be permitted to be substituted for minimum code compliant fenestration product assemblies without penalty. When applying this note and using the RESCheck "UA Trade-off" compliance method to allow continued use of the software, the applicable fenestration products shall be modeled as meeting the U-factor of 0.35 and the SHGC of 0.30, as applicable, but the fenestration products' actual U-factor and actual SHGC shall be noted in the comments section of the software for documentation of application of this note to the applicable products. Compliance for these substitute products shall be verified compared to the allowed substituted maximum U-value requirement and maximum SHGC requirement, as applicable.

e. The air-impermeable insulation shall meet the requirements of the definition in section R202. Air-impermeable insulation shall be installed in direct contact with the underside of the structural roof sheathing. For one- and two-family dwellings and townhouses, the insulation installation shall meet the requirements of R806.5 of the North Carolina Residential Code. Exposed rafters shall be covered with R-7 insulation.

f. For air-permeable/ impermeable applications, Table N1106.2.1 shall be followed for minimum insulation values.

The fiscal note for this item can be viewed at: https://www.ncosfm.gov/bcc-agenda-2020-09-01-fiscal-note-items-b15-and-b21pdf.

Item D – 11 Request from Wayne Hamilton representing the NC Building Code Council to delete the 2018 NC Fire Code, Section 304.4.4 as follows (201208 Item B-1)**:**

~~304.4.4 Revocation. The use of doorstep refuse and recycling collection containers in apartment occupancies is revocable by the fire code official for violations of this section.~~

Item D – 12 Request by Tim Henshaw representing the NC Fire Code Revision Committee to amend the 2018 NC Fire Code, Section 510 and Chapter 80 as follows (201208 Item B-5)**:**

SECTION 510
EMERGENCY RESPONDER ~~RADIO~~ COMMUNICATION COVERAGE

510.1 Emergency responder radio communication coverage in new buildings. ~~All new buildings shall have approved radio coverage for emergency responders within the building based upon the existing coverage level of the public safety communications system of the jurisdiction at the exterior of the building.~~ Approved in-building 2- way emergency responder communication coverage shall be provided in all new buildings. In-building 2-way emergency responder communication coverage shall be based on the existing coverage levels of the public safety communication systems utilized by the jurisdiction, measured at the exterior of the building. This section shall not require improvement of the existing public safety communication systems.

Exceptions:

1. Where *approved* by the building official and the *fire code official*, a wired communication system in accordance with Section 907.2.13.2 shall be permitted to be installed or maintained instead of an *approved* ~~radio~~ communications coverage system.

2. Where it is determined by the *fire code official* that the ~~radio~~ communications coverage system is not needed.

3. In facilities where emergency responder ~~radio~~ communication coverage is required and such systems, components or equipment required could have a negative impact on the normal operations of that facility, the *fire code official* shall have the authority to accept an automatically activated emergency responder ~~radio~~ communication coverage system.

4. New buildings 7,500square feet or less and not more than 1 story above *grade plane.*

4.1. This exception does not apply to windowless buildings, underground buildings or buildings with a *basement.*

510.2 Emergency Responder ~~Radio~~ Communications Coverage in Existing Buildings. Deleted

510.3 Permit required. A construction permit for the installation of or modification to ~~emergency responder radio coverage systems and related equipment is required as specified in Section 105.7.5.~~ in-building 2- way emergency responder communication coverage systems and related equipment is required as specified in Section 105.7.6. Maintenance performed in accordance with this code is not considered a modification and does not require a permit.

510.4 Technical requirements. Equipment required to provide emergency responder ~~radio~~ communication coverage shall be listed in accordance with UL

2524. Systems, components and equipment required to provide the ~~emergency responder radio coverage~~ in-building 2- way emergency responder communication coverage system shall comply with Sections 510.4.1 through ~~510.4.2.5~~ 510.4.2.8.

510.4.1 ~~Radio Signal Strength~~ Emergency communication coverage system signal strength. The building shall be considered to have acceptable ~~emergency responder radio coverage~~ in-building 2- way emergency responder communication system coverage when signal strength measurements in 95 percent of all areas on each floor of the building and critical areas shall be provided with 99 percent floor area radio coverage. Critical areas are fire command centers, fire pump rooms, exit stairs, exit passageways, elevator lobbies, sprinkler rooms, riser rooms, standpipe cabinets, sprinkler sectional valve locations, and other areas deemed critical by the AHJ. The signal strength shall meet requirements in Sections 510.4.1.1 ~~and 510.4.1.2~~ through 510.4.1.3.

510.4.1.1 Minimum signal strength into the building. ~~A minimum signal strength of -95 dBm shall be received within the building.~~ The minimum inbound signal strength shall be sufficient to provide usable voice communications throughout the coverage area as specified by the *fire code official*. The inbound signal level shall be a minimum of -95dBm throughout the coverage area and sufficient to provide not less than a Delivered Audio Quality (DAQ) of 3.0 or an equivalent Signal-to-Interference-Plus-Noise Ratio (SINR) applicable to the technology for either analog or digital signals.

510.4.1.2 Minimum signal strength out of the building. ~~A minimum signal strength of -95 dBm shall be received by the agency's radio when transmitted within the building.~~ The minimum outbound signal strength shall be sufficient to provide usable voice communications throughout the coverage area as specified by the *fire code official*. The outbound signal level shall be sufficient to provide not less than a DAQ of 3.0 or an equivalent SINR applicable to the technology for either analog or digital signals.

510.4.1.3 System performance. Signal strength shall be sufficient to meet the requirements of the applications being utilized by public safety for emergency operations through the coverage area as specified by the *fire code official* in Section 510.4.2.2.

510.4.2 System design. The ~~emergency responder radio coverage~~ in-building 2- way emergency responder communication coverage system shall be designed in accordance with Sections 510.4.2.1 through ~~510.4.2.5~~ 510.4.2.8 and NFPA 1221.

510.4.2.1 Amplification systems ~~allowed~~ and components. Buildings and structures that cannot support the required level of ~~radio coverage shall be equipped with a radiating cable system, a distributed antenna system with Federal Communications Commission (FCC)- certified signal boosters, or other system approved by the *fire code official* in order to achieve the required adequate radio coverage.~~ in-building 2- way emergency responder communication coverage shall be equipped with systems and components to enhance the radio signals and achieve the required level of emergency communication coverage specified in Sections 510.4.1 through 510.4.1.3. Emergency communication systems utilizing radio-frequency-emitting devices and cabling shall be approved by the *fire code official*. Prior to installation, all RF-emitting devices shall have the certification of the radio licensing authority and be suitable for public safety use.

510.4.2.2 Technical criteria. The *fire code official* shall maintain a document providing the specific technical information and requirements for the ~~emergency responder radio coverage system.~~ in-building 2- way emergency responder communication coverage system. This document shall contain, but not be limited to, the various frequencies required, the location of radio sites, the effective radiated power of radio sites, ~~and other supporting technical information.~~ the maximum propagation delay in microseconds, the applications being used and other supporting technical information necessary for system design.

510.4.2.3 Standby power. ~~Emergency responder radio~~ In-building 2-way emergency responder communication coverage systems shall be provided with ~~standby power in accordance with section 604.~~ dedicated standby power or provided with 2-hour standby batteries and connected to the facility generator power system in accordance with Section ~~1203~~ 604. The standby power supply shall be capable of operating the ~~emergency responder radio~~ in-building 2- way emergency responder communication coverage system ~~for a duration of not less than 24 hours.~~ at 100-percent system capacity for a duration of not less than 12 hours.

510.4.2.4 Signal booster requirements. If used, signal boosters shall meet the following requirements:

1. All signal booster components shall be contained in a National Electrical Manufacturer's Association (NEMA) 4-type waterproof cabinet.

2. Battery systems used for the emergency power source shall be contained in a NEMA ~~4 type water proof cabinet~~ 3R or higher-rated cabinet.

3. ~~The signal booster system and battery system shall be electrically supervised and monitored by a supervisor service, or when approved by~~

~~the *fire code official*, shall sound an audible signal at a constantly attended location.~~ Equipment shall have FCC or other radio licensing authority certification and be suitable for public safety use prior to installation.

4. ~~Equipment shall have FCC certification prior to installation.~~ Where a donor antenna exists, isolation shall be maintained between the donor antenna and all inside antennas to not less than 20dB greater than the system gain under all operating conditions.

5. Active RF emitting devices used in in-building 2- way emergency responder communication coverage systems shall have built-in oscillation detection and control circuitry.

6. The installation of amplification systems or systems that operate on or provide the means to cause interference on any in-building 2- way emergency responder communication coverage network shall be coordinated and approved by the *fire code official.*

510.4.2.5 ~~Additional frequencies and change of frequencies. System~~ monitoring. ~~The emergency responder radio coverage system shall be capable of modification or expansion in the event frequency changes are required by the FCC or additional frequencies are made available by the FCC.~~ The in-building 2-way emergency responder communication coverage system shall be monitored by a listed *fire alarm control unit*, or where approved by the *fire code official*, shall sound an audible signal at a constantly attended on-site location. Automatic supervisory signal shall include the following:

1. Loss of normal AC power supply.

2. System battery charger(s) failure.

3. Malfunction of the donor antenna(s).

4. Failure of active RF-emitting device(s).

5. Low-battery capacity at 70-percent reduction of operating capacity.

6. Failure of critical system components.
7. The communications link between the *fire alarm system* and the in-building 2- way emergency responder communication coverage system.

8. Oscillation of active RF-emitting device(s)

510.4.2.6 Additional frequencies and change of frequencies. The in-building 2- way emergency responder communication coverage system shall be capable of modification or expansion in the event frequency changes are required by the FCC or other radio licensing authority, or additional frequencies are made available by the FCC or other radio licensing authority.

510.4.2.7 Design documents. The *fire code official* shall have the authority to require "as-built" design documents and specifications for in-building 2- way emergency responder communication coverage systems. The documents shall be in a format acceptable to the *fire code official*.

510.4.2.8 Radio communication antenna density. Systems shall be engineered to minimize the near-far effect. In-building 2- way emergency responder communication coverage system designs shall include sufficient antenna density to address reduced gain conditions.

Exception:

1. Systems where all portable devices within the same band use active power control features.

510.5 Installation requirements. The installation of the ~~public safety radio~~ in-building 2- way emergency responder communication coverage system shall be in accordance with NFPA 1221 and Sections 510.5.1 through ~~510.5.4~~ 510.5.5.

510.5.1 ~~Approval prior to installation.~~ Mounting of the donor antenna(s). ~~Amplification systems capable of operating on frequencies licensed to any public safety agency by the FCC shall not be installed without prior coordination and approval of the *fire code official.*~~ To maintain proper alignment with the system designed donor site, donor antennas shall be permanently affixed on the building or where approved, mounted on a movable sled with a clearly visible sign stating "Movement or repositioning of this antenna is prohibited without approval from the fire code official". The antenna installation shall be in accordance with the applicable requirements in the *International Building Code* for weather protection of the building envelope.

510.5.2 ~~Minimum qualifications of personnel.~~ Approval prior to installation. ~~The minimum qualifications of the system designer and~~

~~lead installation personnel shall include both of the following:~~

~~1. A valid FCC-issued general radio operator's license.~~

~~2. Certification of in-building system training issued by a national recognized organization, school, or a certificate issued by the manufacturer of the equipment being installed.~~

~~These qualifications shall not be required where demonstration of adequate skills and experience satisfactory to the *fire code official* is provided.~~

Amplification systems capable of operating on frequencies licensed to any public safety agency by the FCC or other radio licensing authority shall not be installed without prior coordination and approval of the *fire code official* and the frequency license holder(s).

510.5.3 ~~Acceptance test procedure.~~ Minimum qualifications of personnel. ~~Where an emergency responder radio coverage system is required, and upon completion of installation, the building *owner* shall have the radio system tested to verify that two-way coverage on each floor of the building is not less than 90 percent. The test procedure shall be conducted as follows:~~ The minimum qualifications of the system designer and lead installation personnel shall include both of the following:

~~1. Each floor of the building shall be divided into a grid of 20 approximately equal test areas.~~

1. A valid FCC-issued general radio operator's license.

~~2. The test shall be conducted using a calibrated portable radio of the latest brand and model used by the agency talking through the agency's radio communications system.~~

2. Certification of in-building system training issued by an approved organization or approved school, or a certificate issued by the manufacturer of the equipment being installed.

~~3. Failure of not more than two nonadjacent test areas shall not result in failure of the test.~~

~~4. In the event that three of the test areas fail the test, in order to be more statistically accurate, the floor shall be permitted to be divided into 40 equal areas. Failure of not more than four nonadjacent test areas shall not result in failure of the test. If the system fails the 40 area test, the system shall be altered to meet the 90-percent coverage requirement.~~

~~5. A test location approximately in the center of each test area shall be selected for the test, with the radio enabled to verify two-way communications to and from the outside of the building through the public agency's radio communications system. Once the test location has~~

~~been selected, that location shall represent the entire test area. Failure in the selected test location shall be considered failure of that test area. Additional test locations shall not be permitted.~~

~~6. The gain values of all amplifiers shall be measured and the test measurement results shall be kept on file with the building *owner* so that the measurements can be verified during annual tests. In the event that the measurement results become lost, the building *owner* shall be required to rerun the acceptance test to reestablish the gain values.~~

~~7. As part of the installation, a spectrum analyzer or other suitable test equipment shall be utilized to ensure spurious oscillations are not being generated by the subject signal booster. This test shall be conducted at the time of installation and at subsequent annual inspections.~~

These qualifications shall not be required where demonstration of adequate skills and experience satisfactory to the *fire code official* is provided.

510.5.4 ~~FCC compliance.~~ Acceptance test procedure. ~~The emergency responder radio coverage system installation and components shall comply with all applicable federal regulations including, but not limited to, FCC 47 CFR Part 90.219.~~ Where an in-building 2- way emergency responder communication coverage system is required, and upon completion of installation, the building *owner* shall have the radio system tested to verify that two-way coverage on each floor of the building is not less than 95 percent. The test procedure shall be conducted as follows:

1. Each floor of the building shall be divided into a grid of 20 approximately equal test areas. Where a floor exceeds 128,000 ft2 (11,900 m2), which is the floor area that can be covered by the maximum grid dimension of 80 ft. (24.4m), the floor shall be subdivided into sectors each having an area less than or equal to 128,000 ft2 (11,900 m2), and each sector be tested individually with 20 grid cells in each sector. Signal strength measurements should be taken at the center of each grid and should be performed using standardized parameters as specified by NFPA 1221.

2. The test shall be conducted using a calibrated portable radio of the latest brand and model used by the agency talking through the agency's radio communications system or equipment approved by the *fire code official.*

3. Failure of more than one test area shall result in failure of the test.

4. In the event that two of the test areas fail the test, in order to be more statistically accurate, the floor shall be permitted to be divided into 40 equal test areas. Failure of not more than two nonadjacent test areas shall not result in failure of the test. If the system fails the 40-area test, the system shall be altered to meet the 95-percent coverage requirement.

5. A test location approximately in the center of each test area shall be selected for the test, with the radio enabled to verify two-way communications to and from the outside of the building through the public agency's radio communications system. Once the test location has been selected, that location shall represent the entire test area. Failure in the selected test location shall be considered to be a failure of that test area. Additional test locations shall not be permitted.

6. The gain values of all amplifiers shall be measured and the test measurement results shall be kept on file with the building *owner* so that the measurements can be verified during annual tests. In the event that the measurement results become lost, the building *owner* shall be required to rerun the acceptance test to reestablish the gain values.

7. As part of the installation, a spectrum analyzer or other suitable test equipment shall be utilized to ensure spurious oscillations are not being generated by the subject signal booster. This test shall be conducted at the time of installation and at subsequent annual inspections.

8. Systems shall be tested using two portable radios simultaneously conducting subjective voice quality checks. One portable radio shall be positioned not greater than 10 feet (3048 mm) from the indoor antenna. The second portable radio shall be positioned at a distance that represents the farthest distance from any indoor antenna. With both portable radios simultaneously keyed up on different frequencies within the same band, subjective audio testing shall be conducted and comply with DAQ levels as specified in Sections 510.4.1.1 and 510.4.1.2.

510.5.5 FCC compliance. The in-building 2- way emergency responder communication coverage system installation and components shall comply with all applicable federal regulations including, but not limited to, FCC 47 CFR Part 90.219.

510.6 Maintenance. The ~~emergency responder radio~~ in-building 2- way emergency responder communication coverage system shall be maintained operational at all times in accordance with Sections 510.6.1 through ~~510.6.3~~ 510.6.4.

510.6.1 Testing and proof of compliance. ~~The emergency responder radio coverage~~ The *owner* of the building or owner's authorized agent shall have the in-building 2- way emergency responder communication coverage system shall be inspected and tested annually or where structural changes occur including additions or remodels that could materially change the original field performance tests. Testing shall consist of the following:

1. In-building coverage test as described in Section 510.5.3.

2. Signal boosters shall be tested to verify that the gain is the same as it was upon initial installation and acceptance~~.~~ or set to optimize the performance of the system.

3. Backup batteries and power supplies shall be tested under load of a period of 1 hour to verify that they will properly operate during an actual power outage. If within the 1-hour test period the battery exhibits symptoms of failure, the test shall be extended for additional 1-hour periods until the integrity of the battery can be determined.

4. ~~Other~~ All active components shall be checked to verify operation within the manufacturer's specifications.

5. At the conclusion of the testing, a report, which shall verify compliance with Section 510.5.3, shall be submitted to the *fire code official*.

510.6.2 Additional frequencies. The building *owner* shall modify or expand ~~the emergency responder radio~~ the in-building 2- way emergency responder communication coverage system at his or her expense in the event frequency changes are required by the FCC or other radio licensing authority, or additional frequencies are made available by the FCC~~.~~ or other radio licensing authority. Prior approval of ~~a public safety radio~~ an in-building 2- way emergency responder communication coverage system on previous frequencies does not exempt this section.

510.6.3 ~~Field Testing.~~ Nonpublic safety system. ~~Agency personnel shall have the right to enter onto the property at any reasonable time to conduct field testing to verify the required level of radio coverage.~~ Where other nonpublic safety amplification systems installed in buildings reduce the performance or cause interference with the in-building 2- way emergency responder communication coverage system, the nonpublic safety amplification system shall be corrected or removed.

510.6.4 Field testing. Agency personnel shall have the right to enter onto the property at any reasonable time to conduct field testing to verify the required level of radio coverage.

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NFPA
NFPA 1221-19 Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems.....510.4.2, 510.5, 510.5.4.

UL
UL2524 -19 Standard for In-building 2- Way Emergency Radio Communication Enhancement Systems .....510.4.

FCC
47 CFR Part 90.219-2007 .....510.5.4, 510.5.5

Item D – 13 Request from Tim Henshaw representing NC Fire Code Revision Committee to amend the 2018 NC Building Code, Section 403.4.5, 916, and 916.1 as follows (201208 Item B-6)**:**

403.4.5 Emergency Responder ~~Radio~~ Communication Coverage. Emergency responder ~~radio~~ communication coverage shall be provided in accordance with Section 510 of the *International Fire Code.*

916 Emergency Responder ~~Radio~~ Communication Coverage

916.1 General. Emergency responder ~~radio~~ communication coverage shall be provided in all new buildings in accordance with Section 510 of the *International Fire Code.*

Item D – 14 Request from the NC Building Code Council, Electrical Ad-Hoc Committee, to adopt the 2020 North Carolina Electrical Code (201208 Item B-7)**.**

The Base Documents for the 2020 NC Electrical Code is the 2020 National Electrical Code (NEC) and can be viewed by going to the following website: https://www.nfpa.org/codes-and-standards/all-codes-and-standards/list-of-codes-and-standards/detail?code=70.

The 2020 NC Building Code Council, Electrical Ad-Hoc Committee proposed amendments are posted at the following website and are replacements to the Sections printed in the Base Document: https://www.ncosfm.gov/bcc-agenda-20201208-proposed-2020-state-electrical-code-amendments.

The fiscal note for this item can be viewed online at: https://www.ncosfm.gov/bcc-agenda-20201208-proposed-2020-state-electrical-code-amendments.

Part E – Reports

- **Ad-Hoc Committee Reports**
- **Standing Committee Reports**
- **Staff Reports**
- **Chairman's Report**

Part F – Appeals

There are currently no appeals scheduled.

Sincerely,

Carl Martin, RA. Secretary,
NC Building Code Council