RES*check* Software Version 4.6.2.1

Compliance Certificate

Project Title: Topsail plan crawl - worst case

Energy Code:	**North Carolina Energy Conservation Code**
Location:	**Lillington, North Carolina**
Construction Type:	**Single Family**
Project Type:	**New construction**
Building Orientation:	**Bldg. faces 0 deg. from North**
Glazing Area Percentage:	**11%**
Heating Degree Days:	**3502**
Climate Zone:	**4**

Construction Site:

NC

Owner/Agent:

H&H Homes
2919 Breezewood Ave, Suite 400
Fayetteville, NC 28303

Designer/Contractor:

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Southern Energy Management
101 Kitty Hawk Dr
Morrisville, NC 27560
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Compliance: **Passes using UA trade-off**

Compliance: **12.1% Better Than Code** Maximum UA: **389** Your UA: **342** Maximum SHGC: **0.30** Your SHGC: **0.27**

The % Better or Worse Than Code index reflects how close to compliance the house is based on code trade-off rules.
It DOES NOT provide an estimate of energy use or cost relative to a minimum-code home.

Assembly	Gross Area or Perimeter	Cavity R-Value	Cont. R-Value	Glazing or Door U-Factor	UA
Ceiling 1: Flat Ceiling or Scissor Truss	1376	26.0	12.0		37
Wall 1: Wood Frame, 16" o.c. Orientation: Front	697	19.0	0.0		34
Window 1: Vinyl Frame:Double Pane with Low-E SHGC: 0.27 Orientation: Front	95			0.350	33
Door 1: Solid Orientation: Front	20			0.200	4
Door 2: Solid Orientation: Front	18			0.200	4
Wall 2: Wood Frame, 16" o.c. Orientation: Left Side	581	19.0	0.0		33
Window 2: Vinyl Frame:Double Pane with Low-E SHGC: 0.27 Orientation: Left Side	30			0.350	11
Wall 3: Wood Frame, 16" o.c. Orientation: Right Side	581	19.0	0.0		33
Window 3: Vinyl Frame:Double Pane with Low-E SHGC: 0.27 Orientation: Right Side	28			0.350	10
Wall 4: Wood Frame, 16" o.c. Orientation: Back	697	19.0	0.0		34
Window 4: Vinyl Frame:Double Pane with Low-E SHGC: 0.27 Orientation: Back	124			0.350	43
over garage: All-Wood Joist/Truss:Over Unconditioned Space	416	19.0	0.0		20
over ambient: All-Wood Joist/Truss:Over Outside Air	11	19.0	0.0		1
over crawl: All-Wood Joist/Truss:Over Unconditioned Space	949	19.0	0.0		45

Compliance Statement: The proposed building design described here is consistent with the building plans, specifications, and other calculations submitted with the permit application. The proposed building has been designed to meet the North Carolina Energy Conservation Code requirements in RES*check* Version 4.6.2.1 and to comply with the mandatory requirements listed in the RES*check* Inspection Checklist.

Justin Smith

Digitally signed by Justin Smith
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Date: 2016.04.29 12:45:09 -04'00'

Name - Title | Signature | Date

REScheck Software Version 4.6.2.1

Inspection Checklist

Energy Code:	**North Carolina Energy Conservation Code**
Location:	**Lillington, North Carolina**
Construction Type:	**Single Family**
Project Type:	**New construction**
Building Orientation:	**Bldg. faces 0 deg. from North**
Glazing Area Percentage:	**11%**
Heating Degree Days:	**3502**
Climate Zone:	**4**

Ceilings:

- ❑ Ceiling 1: Flat Ceiling or Scissor Truss, R-26.0 cavity + R-12.0 continuous insulation
  Comments: ______

Above-Grade Walls:

- ❑ Wall 1: Wood Frame, 16" o.c., R-19.0 cavity insulation
  Comments: ______
- ❑ Wall 2: Wood Frame, 16" o.c., R-19.0 cavity insulation
  Comments: ______
- ❑ Wall 3: Wood Frame, 16" o.c., R-19.0 cavity insulation
  Comments: ______
- ❑ Wall 4: Wood Frame, 16" o.c., R-19.0 cavity insulation
  Comments: ______

Windows:

- ❑ Window 1: Vinyl Frame:Double Pane with Low-E, U-factor: 0.350, SHGC: 0.27,
  For windows without labeled U-factors, describe features:
  #Panes ____ Frame Type ______ Thermal Break? ____ Yes ____ No
  Comments: ______
- ❑ Window 2: Vinyl Frame:Double Pane with Low-E, U-factor: 0.350, SHGC: 0.27,
  For windows without labeled U-factors, describe features:
  #Panes ____ Frame Type ______ Thermal Break? ____ Yes ____ No
  Comments: ______
- ❑ Window 3: Vinyl Frame:Double Pane with Low-E, U-factor: 0.350, SHGC: 0.27,
  For windows without labeled U-factors, describe features:
  #Panes ____ Frame Type ______ Thermal Break? ____ Yes ____ No
  Comments: ______
- ❑ Window 4: Vinyl Frame:Double Pane with Low-E, U-factor: 0.350, SHGC: 0.27,
  For windows without labeled U-factors, describe features:
  #Panes ____ Frame Type ______ Thermal Break? ____ Yes ____ No
  Comments: ______

Doors:

- ❑ Door 1: Solid, U-factor: 0.200
  Comments: ______
- ❑ Door 2: Solid, U-factor: 0.200
  Comments: ______

Floors:

❑ over garage: All-Wood Joist/Truss:Over Unconditioned Space, R-19.0 cavity insulation

Comments: _____

Floor insulation is installed to maintain permanent continuous contact with the underside of the subfloor decking, and insulation ends are blocked. Insulation supports that are noncontinuous (i.e., tension support wires) are spaced no more than 18 inches apart and are within 6 inches from each end of the insulation.

❑ over ambient: All-Wood Joist/Truss:Over Outside Air, R-19.0 cavity insulation

Comments: _____

Floor insulation is installed to maintain permanent continuous contact with the underside of the subfloor decking, and insulation ends are blocked. Insulation supports that are noncontinuous (i.e., tension support wires) are spaced no more than 18 inches apart and are within 6 inches from each end of the insulation.

❑ over crawl: All-Wood Joist/Truss:Over Unconditioned Space, R-19.0 cavity insulation

Comments: _____

Floor insulation is installed to maintain permanent continuous contact with the underside of the subfloor decking, and insulation ends are blocked. Insulation supports that are noncontinuous (i.e., tension support wires) are spaced no more than 18 inches apart and are within 6 inches from each end of the insulation.

Solar Heat Gain Coefficient:

❑ Solar Heat Gain Coefficient (SHGC) values are determined in accordance with the NFRC test procedure or taken from the default table.

Air Leakage:

❑ Joints (including rim joist junctions), attic access openings, penetrations, and all other such openings in the building envelope that are sources of air leakage are sealed with caulk, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material.

❑ Air barrier and sealing exists on common walls between dwelling units, on exterior walls behind tubs/showers, and in openings between window/door jambs and framing.

❑ Recessed lights in the building thermal envelope are 1) type IC rated and ASTM E283 labeled and 2) sealed with a gasket or caulk between the housing and the interior wall or ceiling covering.

❑ Access doors separating conditioned from unconditioned space (e.g., attic, unconditioned basements and crawlspaces) are weather-stripped and insulated (without insulation compression or damage). Where loose fill insulation exists, a wood framed or equivalent baffle is installed to maintain insulation application. Required insulation values are as follows:

(1) Hinged vertical doors have a minimum of R-5 insulation.

(2) Hatches/scuttle hole covers have a minimum of R-10 insulation.

(3) Pull down stairs have a minimum of R-5 rigid insulation.

❑ Site-built masonry fireplaces have doors and comply with Section R1006 of the North Carolina Residential Code for combustion air.

Air Sealing and Insulation:

❑ Building envelope air tightness and insulation installation complies with one of the following (mark the method that was applied):

(1) ____ Post rough-in blower door test result of less than or equal to 5 ACH at 50 pascals.

(2) ____ Post rough-in blower door test result of less than or equal to 0.30 CFM50/square foot of surface area.

(3) ____ Visual inspection. The following items, along with all other air leakage requirements in this report, are certified by the builder, permit holder or registered design professional as completed.

(a) Ceiling/attic: Sealants or gaskets provide a continuous air barrier system joining the top plate of framed walls with either the ceiling drywall or the top edge of wall drywall to prevent air leakage. Top plate penetrations are sealed.

(b) Ceiling/attic: For ceiling finishes that are not air barrier systems such as tongue-and-groove planks, air barrier systems (e.g., taped house wrap) are used above the finish.

(c) Above Grade Walls: Sill plate is gasketed or sealed to subfloor or slab.

(d) Windows/doors: Space between window and door jambs and framing are sealed.

(e) Floors: Air barrier system is installed at any exposed edge of insulation.

Sunrooms:

❑ Sunrooms that are thermally isolated from the building envelope have a maximum fenestration U-factor of 0.40 and the maximum skylight U-factor of 0.75.

❑ Sunrooms with cooling systems shall have a maximum fenestration SHGC or 0.40 for all glazing.

Materials Identification and Installation:

❑ Materials and equipment are installed in accordance with the manufacturer's installation instructions.

❑ Materials and equipment are identified so that compliance can be determined.

❑ Manufacturer manuals for all installed heating and cooling equipment and service water heating equipment have been provided.

❑ Insulation R-values and glazing U-factors are clearly marked on the building plans or specifications.

Duct Insulation:

- ❑ Supply and return ducts in unconditioned space and outdoors are insulated to R-8. Supply ducts inside semi-conditioned space are insulated to R-4.

Duct Construction and Testing:

- ❑ Building framing cavities are not used as supply ducts.
- ❑ All joints and seams of air ducts, air handlers, filter boxes, and building cavities used as return ducts are sealed. Joints and seams comply with Part V - Mechanical, Section 603.9 of the North Carolina Residential Code.
- ❑ Postconstruction total duct leakage test (including air handler enclosure) has been performed and results are less than or equal to 138.0 cfm (6 cfm per 100 ft2 of conditioned floor area) pressure differential of 0.1 inches w.g. Tests are performed according to North Carolina Energy Conservation Code guidelines (Section 403.2.2).

Temperature Controls:

- ❑ Where the primary heating system is a forced air-furnace, at least one programmable thermostat is installed to control the primary heating system and has set-points initialized at 70 degree F for the heating cycle and 78 degree F for the cooling cycle.
- ❑ Heat pumps having supplementary electric-resistance heat have controls that prevent supplemental heat operation when the compressor can meet the heating load.

Heating and Cooling Equipment Sizing:

- ❑ Heating and cooling equipment shall be sized in accordance with the North Carolina Mechanical Code.
- ❑ For systems serving multiple dwelling units documentation has been submitted demonstrating compliance with 2009 IECC Commercial Building Mechanical and/or Service Water Heating (Sections 503 and 504).

Circulating Service Hot Water Systems:

- ❑ Circulating service hot water pipes are insulated to R-2.
- ❑ Circulating service hot water systems include an automatic or accessible manual switch to turn off the circulating pump when the system is not in use.

Heating and Cooling Piping Insulation:

- ❑ HVAC piping conveying fluids above 105 degrees F or chilled fluids below 55 degrees F are insulated to R-3.

Swimming Pools:

- ❑ Heated swimming pools have an on/off heater switch.
- ❑ Pool heaters operating on natural gas or LPG have an electronic pilot light.
- ❑ Timer switches on pool heaters and pumps are present.
  Exceptions:

  Where public health standards require continuous pump operation.

  Where pumps operate within solar- and/or waste-heat-recovery systems.
- ❑ Heated swimming pools and in-ground permenantly installed spas have a vapor-retardent cover.
  Exceptions:

  Covers are not required when 70% of the heating energy is from site-recovered energy or solar energy source.

Lighting Requirements:

- ❑ A minimum of 75 percent of the lamps in permanently installed lighting fixtures can be categorized as one of the following:

  (a) Compact fluorescent

  (b) T-8 or smaller diameter linear fluorescent

  (c) 40 lumens per watt for lamp wattage <= 15

  (d) 50 lumens per watt for lamp wattage > 15 and <= 40

  (e) 60 lumens per watt for lamp wattage > 40

Other Requirements:

- ❑ Snow- and ice-melting systems with energy supplied from the service to a building shall include automatic controls capable of shutting off the system when a) the pavement temperature is above 50 degrees F, b) no precipitation is falling, and c) the outdoor temperature is above 40 degrees F (a manual shutoff control is also permitted to satisfy requirement 'c').

Certificate:

- ❑ A permanent certificate is provided on or in the electrical distribution panel listing the predominant insulation R-values; window U-factors; type and efficiency of space-conditioning and water heating equipment. The certificate does not cover or obstruct the visibility of the circuit directory label, service disconnect label or other required labels.

NOTES TO FIELD: (Building Department Use Only)

North Carolina Energy Efficiency Certificate

Insulation Rating	R-Value
Ceiling / Roof	38.00
Above-Grade Wall	19.00
Below-Grade Wall	0.00
Floor	19.00
Ductwork (unconditioned spaces):	_____

Glass & Door Rating	U-Factor	SHGC
Window	0.35	0.27
Door	0.20	NA

Heating & Cooling Equipment	Efficiency
Heating System:_____	_____
Cooling System:_____	_____
Water Heater:_____	_____

Building Air Leakage and Duct Test Results	
Air Leakage Compliance Method:	___ Visual Inspection
	___ Air Leakage Test
Building Air Leakage Test Results	_____
Name of Air Leakage Tester	_____
Duct Tightness Test Results	_____
Name of Duct Tester	_____

Name: _____ **Date:** _____

Comments: