North Carolina 2018 - Simulated Performance Alternative (N1105)

Property
91 Thomas Trail
Lillington, NC 27546
Model: Russell
Community: Leander Lee Preserve

Mungo Homes Leander Lee Preserve 4
91 Thomas Trail

Organization
Builder i Group, LLC
Mark Osborne

Builder
Mungo Homes

Inspection Status
Results are projected

This report is based on a proposed design and does not confirm field enforcement of design elements.

Annual Energy Cost

Design	North Carolina 2018 Performance	As Designed
Heating	$841	$845
Cooling	$286	$236
Water Heating	$264	$264
Mechanical Ventilation	$0	$0
SubTotal - Used to determine compliance	**$1,390**	**$1,345**
Lights & Appliances w/out Ventilation	$574	$574
Onsite generation	$0	$0
Total	**$1,964**	**$1,919**

Source Energy Exception: The proposed home uses 5.01 MBtu LESS source energy than the reference home.

Requirements

✓	R405.3	Performance-based compliance passes by 4.7%	The proposed house meets the North Carolina 2018 Performance reference energy bill requirement by $45.16 (5.01 MBtu).
✓	R402.4.2.2	Air Leakage Testing	
✓	R402.5	Area-weighted average fenestration SHGC	Area-weighted average fenestration SHGC is 0.19. The maximum allowed value is [No Limit].
✓	R402.5	Area-weighted average fenestration U-Factor	
✓	R404.1	Lighting Equipment	
✓	Mandatory Checklist	Mandatory code requirements that are not checked by Ekotrope must be met.	2015 IECC Mandatory Checklist must be checked as complete.
✓	R403.3.1	Duct Insulation	Duct insulation meets the requirements specified in North Carolina 2018 Code Section 403.3.1.

Design exceeds requirements for North Carolina 2018 Performance compliance by 4.7%.

As a 3rd party extension of the code jurisdiction utilizing these reports, I certify that this energy code compliance document has been created in accordance with the requirements of Chapter 4 of the adopted International Energy Conservation Code based on HARNETT County. If rating is Projected, I certify that the building design described herein is consistent with the building plans, specifications, and other calculations submitted with the permit application. If rating is Confirmed, I certify that the address referenced above has been inspected/tested and that the mandatory provisions of the IECC have been installed to meet or exceed the intent of the IECC or will be verified as such by another party.

Name: Mark Osborne
Signature: Mark Osborne
Organization: Builder i Group, LLC
Digitally signed: 11/10/25 at 8:35 AM

Energy Code Inspection Checklist

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General Building Information

Conditioned Area (sq ft)	2,570
Conditioned Volume (cubic ft)	23,395.6
Insulated Shell Area (sq ft)	5,832.5

The building energy model in Ekotrope reflects the building assemblies and energy features listed below. Sometimes energy features will change in the field from what has been modeled. The inspection process should identify any changes and ensure that the home continues to meet the applicable energy code.

Slab

☐ Name: Slab(1,088 s.f., 114 ft. exterior perimeter)
R-0 perimeter insulation, R-0 under slab insulation.

Framed Floor

☐ Name: Floor Over Garage (381 s.f.)
R-0 continuous insulation, R-38 cavity insulation
Insulation Grade: II

Foundation Wall

None Present

Above Grade Wall

☐ Name: Exterior Wall (2,258 s.f.)
R-0 continuous insulation, R-15 cavity insulation
Insulation Grade: II

☐ Name: Attic Wall (67.5 s.f.)
R-0 continuous insulation, R-15 cavity insulation
Insulation Grade: II

☐ Name: Garage Wall (351 s.f.)
R-0 continuous insulation, R-15 cavity insulation
Insulation Grade: II

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Rim Joist

- [ ] Name: Rim (205 s.f.)
  R: 15.00

Ceiling / Roof

- [ ] Name: Roof (1,376 s.f.)
  R-28 continuous insulation, R-10 cavity insulation
  Insulation Grade: I

- [ ] Name: PDS (10 s.f.)
  R-5 continuous insulation, R-0.5 cavity insulation
  Insulation Grade: I

- [ ] Name: Mechanical Platform (96 s.f.)
  R-0 continuous insulation, R-38 cavity insulation
  Insulation Grade: II

Opaque Door

- [ ] Name: Opaque Door - Entry (20 s.f.)
  R: 3.50

- [ ] Name: Opaque Door - Garage entry (17.8 s.f.)
  R: 3.50

Glazing

- [ ] Name: Front Windows (99.3 s.f.), U: 0.330, SHGC: 0.19, Orientation: SOUTH_WEST

- [ ] Name: Right Window (4 s.f.), U: 0.330, SHGC: 0.19, Orientation: NORTH_WEST

- [ ] Name: Rear Window (107 s.f.), U: 0.330, SHGC: 0.19, Orientation: NORTH_EAST

- [ ] Name: Left Window (12 s.f.), U: 0.330, SHGC: 0.19, Orientation: SOUTH_EAST

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Skylight

None Present

Mechanical Ventilation

None Present

Mechanical Equipment

☐ Heating Equipment • Natural Gas • 100% Heating Load @ 80 AFUE

☐ Cooling Equipment • Electric • 100% Cooling Load @ 14 SEER

☐ Water Heater • Natural Gas • 100% Hot Water Load @ 0.81 Energy Factor

Air Leakage Control

☐ Test Status: Blower-door tested
House is air-sealed as to achieve 1,950 CFM50 (5.00 ACH50) or less at final blower-door test.

Infiltration Requirements for IECC in Climate Zone 4

2009 IECC Infiltration limit for the design home is 7 ACH50.
2012 IECC Infiltration limit for the design home is 3 ACH50.
2015 IECC Infiltration limit for the design home is 3 ACH50.
2018 IECC Infiltration limit for the design home is 3 ACH50.
2021 IECC Infiltration limit for the design home is 5 ACH50.
2024 IECC Infiltration limit for the design home is 4 ACH50.
Note: Under IECC 2021 and later, this home is considered to be in Climate Zone 3

Duct Leakage

Duct System 1

NOT entirely within conditioned space, testing required
Leakage to Outside specified as: 4 CFM25 / 100 ft^2
Total Leakage specified as: 6 CFM25 / 100 ft^2 (Post-Construction)

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Duct Leakage Code Requirements for IECC

2009 IECC:

Postconstruction Leakage Test: Duct Leakage to Outdoors <= 8 CFM25 / 100 sq ft CFA.
Rough in Test with AHU: Total Duct Leakage <= 6 CFM25 / 100 sq ft CFA.
Rough in Test without AHU: Total Duct Leakage <= 4 CFM25 / 100 sq ft CFA.

2012 IECC Mandatory, 2015, 2018, & 2021 IECC Prescriptive Paths:

Postconstruction Leakage Test: Total Duct Leakage <= 4 CFM25 / 100 sq ft CFA.
Rough in Test with AHU: Total Duct Leakage <= 4 CFM25 / 100 sq ft CFA.
Rough in Test without AHU: Total Duct Leakage <= 3 CFM25 / 100 sq ft CFA.

2015 and 2018 IECC Performance Path (Cost Compliance):

Leakage testing is required UNLESS all ducts and air handlers are located entirely within the thermal envelope.
There is no pass/fail threshold for duct leakage on the performance path.

2024 IECC Prescriptive Path:

>1,000 Sqft. Conditioned Floor Area
- Space conditioning equipment is not installed: Less than 3 return grills ≤ 3 CFM, 3 or more return grills ≤ 4 CFM
- All components of the duct system are installed: Less than 3 return grills ≤ 4 CFM, 3 or more return grills ≤ 6 CFM
- Space conditioning equipment is not installed, but the ductwork is located entirely in conditioned space:
  - Less than 3 return grills ≤ 6 CFM, 3 or more return grills ≤ 8 CFM
- All components of the duct system are installed entirely located in conditioned space:
  - Less than 3 return grills ≤ 8 CFM, 3 or more return grills ≤ 12 CFM

≤1,000 Sqft. Conditioned Floor Area
- Space conditioning equipment is not installed: ≤ 30 CFM
- All components of the duct system are installed: ≤ 40 CFM
- Space conditioning equipment is not installed, but the ductwork is located entirely in conditioned space: ≤ 60 CFM
- All components of the duct system are installed entirely located in conditioned space: ≤ 80 CFM

Project Notes

alt 2nd floor layout changes plan to 4 bedrooms. No changes to takeoff