

Insulation is judged based on two criteria: R-Value and Grade. Both of these items affect a participating home's overall energy efficiency, HERO compliance, and incentive. While R-Value is determined by the amount and type of insulation, Grade depends entirely on the quality of the *installation*. Insulation is graded on a scale of I to III, with Grade I being of the highest quality. The table below shows the impact of above grade wall insulation Grade on the electric savings of a typical 2,300 square foot, 3 bedroom, all electric home built in both Raleigh and Wilmington.

	Raleigh Electric Savings (kWh)	Rebate Impact (Grade I Baseline)	Wilmington Electric Savings (kWh)	Rebate Impact (Grade I Baseline)
Grade I	1,764	--	2,518	--
Grade II	1,624	-\$126	2,417	-\$91
Grade III	1,414	-\$315	2,267	-\$226

Phase specifications for insulation contractors typically include requirements that insulation be installed to the manufacturer's guidelines. Enforcing the Phase Spec on installers should increase rebates without incurring any extra cost.

Listed below are explanations of the three insulation Grades as defined by the RESNET Technical Standards, the primary document referenced by home energy raters.

#### Grade I:

"Grade I" describes insulation that is generally installed according to manufacturer's instructions and/or industry standards. A "Grade I" installation requires that the insulation material uniformly fills each cavity side-to-side and top-to-bottom, without substantial gaps, voids, or compression.

- Enclosed on all six sides and in substantial contact with the sheathing on at least one side (interior or exterior) of the cavity. No exterior sheathing should be visible through gaps in insulation. **Note:** While not recommended for air sealing purposes, homes in Climate Zone 3 may omit interior sheathing if the insulation is otherwise well-supported with webbing, staples, etc.
- Installed without substantial gaps or voids around framing, plumbing, or wiring. Insulation is split around obstructions to prevent compression on either side. Extra insulation is not stuffed between exterior sheathing and plumbing, framing, or wiring.
- Kraft paper faced batts are front-stapled; or side-stapled, provided the tabs are stapled neatly (no buckling), and the batt is only compressed at the edges of each cavity, to the depth of the tab itself.



Grade II:

“Grade II” describes wall insulation that is enclosed on all six sides but has moderate to frequent installation defects such as:

- Up to 10% of the insulation area is compressed by 30% or more of the intended thickness (e.g. 1” compression for a 3.5” deep stud).
- Moderate to frequent gaps or compression around wiring, electrical outlets, plumbing and other intrusions;
- Rounded edges or “shoulders” at the perimeter of stud bays
- Gaps and spaces running clear through the insulation amounting to no more than 2% of the total surface area covered by the insulation.



Grade III:

“Grade III” describes wall insulation with substantial gaps and voids and/or missing insulation amounting to between 2%-5% of the surface area is intended to occupy. Walls with more than 5% missing insulation shall be considered uninsulated surfaces. “Grade III” insulation could have the following issues:

- More than 10% of the insulation area is compressed by 30% or more of the intended thickness.
- Not in substantial contact with the sheathing on at least one side of the cavity.
- Open (unsheathed) on one side and exposed to ambient conditions, a vented attic, or a crawlspace.

