



Manufactured Building

Wayne Goodwin, Commissioner of Insurance
Rick McIntyre, Assistant State Fire Marshal

MEMORANDUM

DATE: August 21, 2015

TO: Third Party Inspection Agencies and Modular Manufacturers

FROM: Shane Phelps
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Manufactured Building Division

RE: Floor Insulation Installation in NC Modular Units

It has recently come to the attention of this Office that floor insulation is not being installed per Code requirements.

Section N1102.2.6 of the **2012 NC Residential Code** and **Section 402.2.6** of the **NC Energy Code** states:

“Floor insulation **shall** be installed to maintain permanent contact with the underside of the subfloor decking. The distance between tension support wires or other devices that hold floor insulation in place against the subfloor **shall be no more than 18 inches**. In addition, supports shall be located **no further than 6 inches** from each end of the insulation.

Exception: Enclosed floor cavity such as garage ceilings, cantilevers or buildings on pilings with enclosed floor cavity with the **insulation fully in contact with the lower air barrier**. In this case, the band boards shall be fully insulated to maintain thermal envelope continuity.”

Insulation installed in the plant must be per the Code requirements and be able to withstand transportation as constructed. If insulation is being installed onsite, then the plans must clearly indicate the R-value required and that it is the local jurisdiction’s responsibility to inspect it.

Some manufacturers are using the “bottom board” material as the air barrier exception. If this exception is used, the bottom board material must meet the air barrier material requirements per the definition:

“Material(s) that have an air permeability not to exceed 0.004 cfm/sq. ft. under a pressure differential of 0.3 in. water when tested in accordance with ASTM E 2178.” (**Section 202, 2012 NC Energy Code**)

Where the insulation is installed within the floor joist cavity, the air barrier material is required to support the insulation to hold the insulation within the joist cavity and must be fastened per the required 18 inches and 6 inches from each end of the insulation at a minimum. Where the insulation is a continuous blanket, the bottom board must be installed to prevent sagging and maintain thermal envelope continuity. The continuous blanket insulation is more commonly used in the on-frame designs. Manufacturers must submit this design for review and approval to demonstrate thermal envelope continuity. Details must be sufficient enough to determine Code compliance including how the bottom board is attached.

The commercial provisions of the Code do not have an explicit statement as is the case in the NC Residential Code. However, the Code does require that insulation products must be installed in accordance with the manufacturers' instructions. The insulation must be installed in contact with an air barrier to achieve the manufacturer's tested and rated performance. Plans/manuals for commercial occupancies must provide sufficient detail and information to determine compliance with the Code.

Third Party Agencies must verify compliance during plan review and during the plant inspections to insure all modular units are constructed in compliance with the Code.

cc: Joseph H. Sadler, P.E. – Deputy Director
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