

Moisture Control in Insulated Raised Floor Systems in Southern Louisiana

In flood-prone areas, houses are typically constructed with the floor raised above flood elevation. Management of moisture flows in buildings is especially important in the Gulf Coast region, with its long, humid summers and abundant rainfall. Moisture levels in the floors of raised wood-frame houses depend on many factors including environmental conditions, site grading, heating and air-conditioning, and insulation. Various types of insulation differ in resistance to airflow and water vapor diffusion. Research is needed to evaluate methods of insulating raised floors based on how well protected the wood structural members are from moisture accumulation.

Background

Problems such as wood decay, mold growth, poor indoor air quality, corrosion of metals, and buckling of flooring can occur if moisture is not well managed. Although previous research on raised floors in various climates has shed light on the major causes of moisture accumulation, little field research has been conducted in the Gulf Coast region. Furthermore, little documentation exists regarding insulation performance. Following Hurricane Katrina, flood elevations have been raised in many jurisdictions. The proper elevation can be attained with a raised wood floor system, but research is needed to establish best practices for insulation and moisture control.

Objective

This study aims to document the air temperature and humidity conditions in the under-floor spaces of raised floor houses and to determine which types of insulation applied below the floor provide adequate protection against moisture accumulation.

Approach

A total of 12 houses in New Orleans and Baton Rouge will be monitored for 1 year. Sites have been selected with fairly challenging conditions—in some cases, grading results in wet soil under the house, and in most cases, ground vapor barriers are intentionally omitted. Air temperature and relative humidity will be recorded with data loggers placed in

strategic locations under the floor, inside the house, and outdoors. In addition, researchers will take on-site measurements, including ground temperature, wood surface temperature, and wood moisture content in the floor system. The different types of insulation that will be evaluated include foil-faced rigid polyisocyanurate foam, open-cell sprayed polyurethane foams of varying vapor permeance, closed-cell sprayed polyurethane foam, and kraft-faced fiberglass batt insulation.

Expected Outcomes

This research will result in guidance for insulating raised floors in the hot and humid climate of the Gulf



Houses with pier foundations recently constructed by Habitat for Humanity in New Orleans, LA.



This pier foundation supports a raised floor framed with pressure-treated lumber.

Coast region. The recommendations will improve the durability and moisture tolerance of wood-frame housing and will benefit homeowners, builders, architects, insulation contractors, home inspectors, consultants, and researchers.

Timeline

Installation of floor insulation and instrumentation in the houses is planned for November 2007. Monitoring will commence shortly thereafter for 12 months. A final report is expected by March 2009.

Cooperators

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