

MOISTURE CONTROL IN CRAWL SPACES

by

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Problem

Special attention is required for crawl spaces located in Florida. Because of the hot and humid climate, moisture can become a serious problem if no means for moisture control are implemented. Moisture can cause premature failure of structural members and mold and mildew inside the building.

Background

In the hot and humid climate of south Florida, generally, the indoor temperatures and humidities are lower than the outdoor levels. Both moisture and temperature travel from the outside into the building.

When moisture enters the crawl space, it comes in contact with floor joists, beams, columns, etc. that are about the same temperature as the inside space. When moist air is present, moisture will condense out of the air onto the structural members which can cause their decay.

Moisture can also infiltrate through the floor and cause cupping or buckling of wood floors, mold and mildew beneath vinyl floors, and increased indoor relative humidity levels. Increased maintenance costs, electricity costs, and poor indoor air quality are results of uncontrolled moisture infiltration.

Solution

Minimizing the amount of moisture within the crawl space is difficult and requires the use of good building construction practices. The best way to control moisture is to prevent it from entering the crawl space. Moisture enters the crawl space through two means; up through the soil and in through open vents in the crawl space walls.

To address the moisture in the soil, a ground cover is the most effective means of moisture control (Rose and TenWolde). Lay a 6 mil polyethylene vapor

retarder directly on leveled soil, a minimum of 18 inches below any wood framing members per ASHRAE Handbook of Fundamentals (ASHRAE 2001). Joints should overlap by 12 inches and be taped together. Run the polyethylene up the crawl space walls to a level above the exterior grade and seal them. Pour a 2-inch thick concrete topping over the polyethylene to help form a good seal. This will also be good practice to inhibit insect and rodent damage to the polyethylene.

To address the open vents, seal the vents and the walls to minimize the amount of warm and humid air infiltrating into the crawl space. In addition, all penetrations into the crawl space should be sealed. This includes electrical wiring, plumbing pipe and air-conditioning ducts. Insulate hot water piping and ductwork to maximize energy efficiency.

Insulation is effective in reducing the heat gain into the building. In addition, a spray-on foam insulation as manufactured by Icynene, can significantly reduce the infiltration of moisture. Apply the insulation on the underside of the floor between the floor trusses. Insulation in the walls of the crawl space is not necessary because the floor is insulated.

References

ASHRAE. 2001. 2001 ASHRAE Handbook – Fundamentals, p. 24.10-24.11. Atlanta: American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.

Rose, W. B. and TenWolde, A. 1994. Issue in Crawl Space Design and Construction – A Symposium Summary, p. 1-4. ASHRAE Technical Data Bulletin, Volume 10, Number 3. Atlanta: American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.