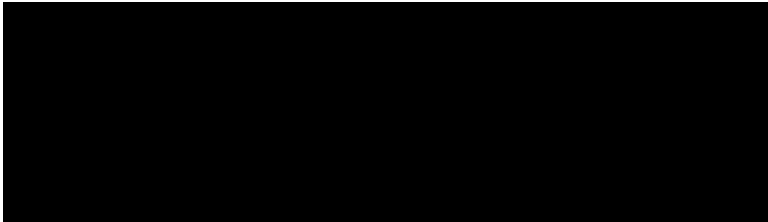




THE AUSTIN HOME INSPECTOR

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To Whom It May Concern:

On 08MAY2019, a site visit to the above mentioned property was made in order to perform a property assessment. A partial and limited assessment of the foundation and crawlspace was conducted at that time. Areas of concern and recommendations have been provided herein.

Multiple assessment limitations reduced the ability to fully investigate the system and additional issues/concerns, both minor and significant, may be present. The assessment process is not designed to be intrusive, destructive, or all encompassing. Rather, the assessment and report represent this inspector's professional opinion of the overall condition of the structure and/or associated systems pertaining to the scope of work. This 3rd party assessment and report has been provided to the client and representing agents for the purposes of due diligence, filing of available information, and additional client protection. The assessment process and report do not, in any manner, represent a guarantee of warranty of the above mentioned property or associated system conditions.

System information noted at the time of assessment is listed below. This is not an official TREC report document.



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CRAWLSPACE ASSESSMENT

OBSERVATIONS - CRAWLSPACES:

The inspected property is comprised of two separate crawlspaces which are divided by a center concrete stem wall. The center wall runs from the front to the back of the building and is located roughly at the center of the home (acting as a load bearing member for interior walls). The left crawlspace can be accessed through a hinged door at the concrete stem wall. Height above grade ranging from 6' to 2', with the greatest height located near the left perimeter wall. The left crawlspace was not provided ventilation at the perimeter stem walls, however, the back portion of the crawlspace remains open to the wood framed deck above. Open cell foam insulation has been installed throughout the upper crawlspace at the floor joists and decking.

The right crawlspace can be accessed through a vent port at the front portion of the stem wall. Height above grade ranging from 16-24". The right perimeter stem wall sites below grade and has been provided a rubber membrane barrier. The condition of the barrier is unknown. The right crawlspace was provided ventilation at the front perimeter walls, however, the right and back portion of the crawlspace is not vented. Open cell foam insulation has been installed throughout the upper crawlspace at the floor joists and decking. A small section of closed cell insulation was also noted at the mid right portion of the crawlspace. The purpose for the isolated change in material types is unknown.

SITE CONDITIONS - LEFT CRAWLSPACE:

At the time of inspection, wood rot, suspect surface mold, and fungal growth was visually discovered within the crawlspaces (mainly at stored material, wood products, and soil surfaces). Excessive moisture accumulation was discovered at areas under the back deck, at the back corner (near center stem wall and plumbing) and at isolated portions of of the perimeter stem wall (throughout). A visual assessment and equipment readings indicated that humidity levels were well over recommended levels.

SITE CONDITIONS - RIGHT CRAWLSPACE:

At the time of inspection, suspect mold was visually discovered within the crawlspaces (mainly at wood products, and the surfaces of open cell foam insulation). Excessive moisture accumulation was discovered at various portions of of the perimeter stem walls and throughout. A visual assessment and equipment readings indicated that humidity levels were well over recommended levels.

GENERAL CONCERNS - CRAWLSPACES:

The crawlspaces have not been provided adequate ventilation or encapsulation. Additionally, excess moisture has accumulated at various areas indicating that an improper below grade moisture barrier may be present (particularly at the right side stem wall). The lack of proper ventilation and airflow coupled with excess moisture intrusion has resulted in damage to moisture susceptible materials, conditions conducive to the growth and proliferation of mold, problematic air quality and environmental conditions, and humidity conditions which increase the likelihood of vapor drive and/or diffusion into the floor assembly. Additionally, the presence of open cell foam insulation in an un-encapsulated, high moisture environment presents an installation and material condition concern. Open cell foam is considered to be a permeable to semi-permeable material and, although not specifically prohibited from use in crawlspaces, the installation of this material in high moisture, ambient environments is typically excluded in manufacturer recommendations. Commonly observed installation practices call for open cell foam to be placed in encapsulated/sealed environments. Open cell foam exposed to unfavorable, high moisture conditions increase the likelihood of moisture entrapment, vapor diffusion, vapor drive, and various associated issues which may cause continued damage to the structure.

RECOMMENDATIONS FOR FURTHER ACTION - CRAWLSPACES:

Further action will be required to determine the best course of action to address problematic moisture and environmental conditions within the crawlspace. Following initial moisture remediation and repair, updates to grading drainage, moisture barrier protection, ventilation or encapsulation will be required. Additional inspections/testing during and after repairs and updates take place are advised.

Further investigation of the current condition of foam insulation located in the crawlspaces should be conducted by a subject matter expert to determine if removal is required. Updates to insulation should be conducted per the guidance of the contracted subject matter expert.

INDUSTRY AND RESEARCH INFORMATION:

Below are several excerpts from industry, governmental, and/or academic sources which further explain best practices and concerns.

Vapor Retarder Application:

When required, a vapor retarder shall be applied to the substrate to be insulated or to the finished spray polyurethane foam insulation. The predominant direction of the vapor drive determines the location of the vapor retarder relative to the spray polyurethane foam

Source: Johns Manville Open Cell Appendix X Spray Foam Insulation

Crawl Space Construction:

-Control bulk moisture, with proper grading, drainage, foundation damp proofing, capillary breaks, and flashing, to keep rain and groundwater out of the crawl space, including during construction.

-Control vapor migration due to air leakage, from the crawl space to the house through the floor, with effective air sealing – seal all floor penetrations, rim areas, and insulation seams, as required.

-Consider treated wood for floor framing and subfloors to improve moisture resistance – particularly in a vented crawl space with permeable insulation and where floor joists are exposed below the insulation.

-Consider building an unvented crawl space – floor covering permeability does not matter because the space is conditioned.

Source: NAHB Technical Notes, Floors Above Crawl Spaces: Reducing the Risk of Moisture Accumulation within Wood Floor Assemblies

Floor Component Selection for Vented and Open Crawl Spaces in Hot-Humid Climates:

-Select the R-value of floor insulation to meet building code or above code energy program requirements.

-Select vapor impermeable or semi-impermeable insulation to minimize vapor diffusion into the floor assembly.

-Ensure that under-floor insulation does not impede pest inspection, where applicable.

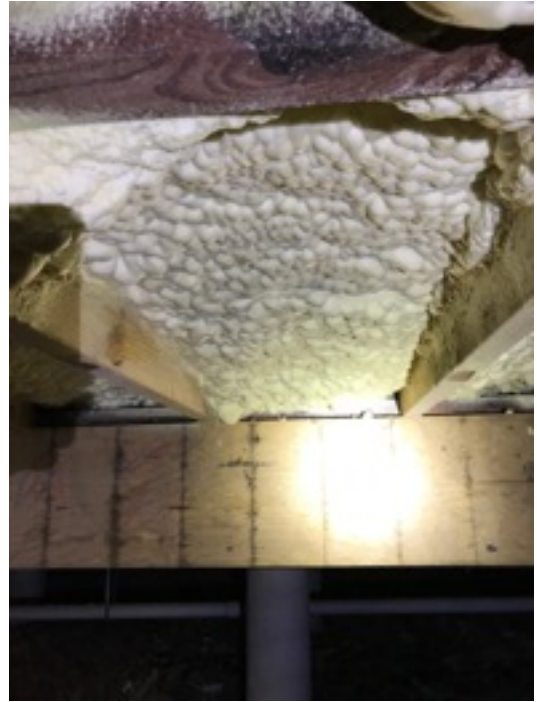
-Avoid installing vapor impermeable flooring and underlayment products where the insulation is vapor permeable.

Source: NAHB Technical Notes, Floors Above Crawl Spaces: Reducing the Risk of Moisture Accumulation within Wood Floor Assemblies

INSPECTION PHOTO LIBRARY:



LEFT CRAWL SPACE



OPEN CELL FOAM INSULATION



MOISTURE PENETRATION



MOISTURE PENETRATION



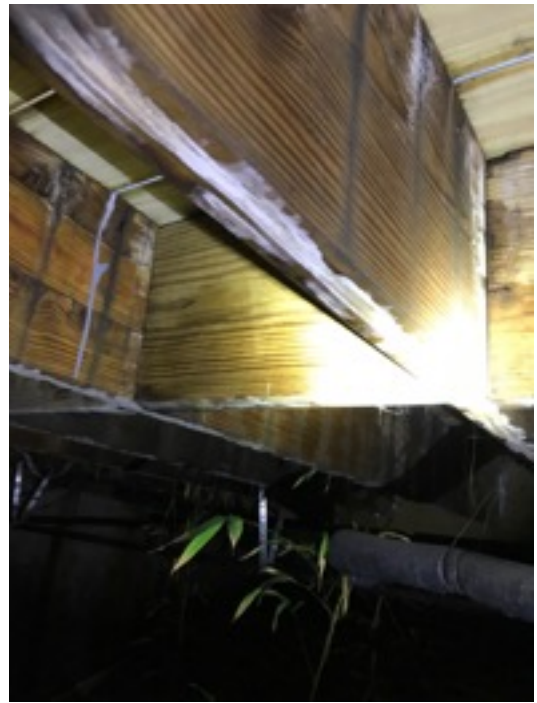
VISUALLY DISCOVERED MOLD



VISUALLY DISCOVERED MOLD



SUSPECT MOLD/FUNGAL GROWTH



SUSPECT MOLD/FUNGAL GROWTH



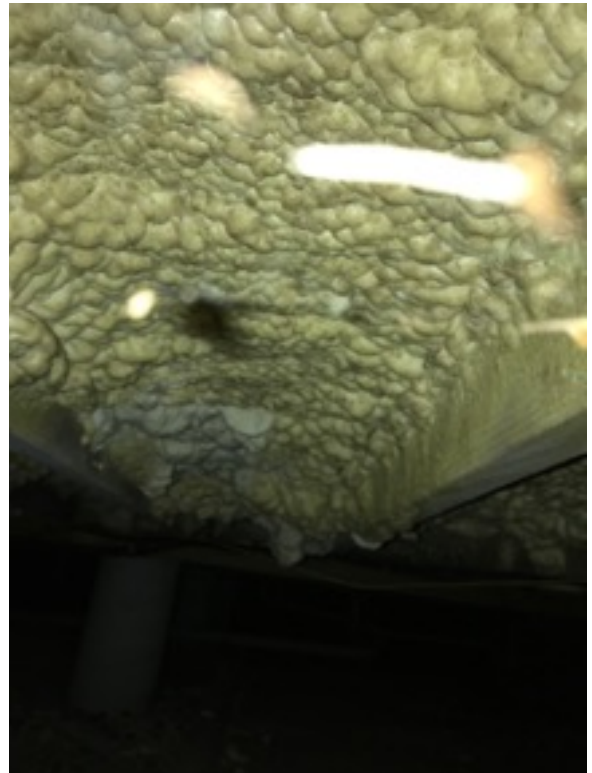
EXCESS MOISTURE AT BACK CORNER



MOLD/FUNGAL GROWTH AT TRAPS



RIGHT SIDE CRAWL SPACE



SUSPECT SURFACE MOLD



EXCESS MOISTURE AT STEM WALL



EXCESS MOISTURE AT STEM WALL



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