

Name: _____

Address: _____

Telephone: _____

County: _____

Housing Moisture Audit

Identify the Symptoms:

The first step in the moisture audit process involves noting symptoms of excess moisture and identifying their locations, both inside and out. The following checklist can help identify locations where moisture problems may exist. Try to be as specific as possible when describing the location.

<u>Typical Symptoms</u>	<u>Location</u>
Condensation, fogging, frost or ice	_____
Sweating pipes, leaks or dripping noise	_____
Strong or musty odors	_____
Damp sensation, mold, mildew	_____
Discoloration, staining or texture changes on wood or masonry surfaces	_____
Evidence of moisture in crawl space	_____
Paint peeling, blistering, cracking	_____
Matted Insulation	_____
Water puddles or drainage problem	_____
Corrosion or rust on metal surfaces	_____
Rot or wood decay (colored powdery texture on wood)	_____
Water-carrying fungus (dingy, vine-like fungus strands)	_____
Warped wooden surfaces	_____
Concrete or masonry chipping	_____
Other: _____	_____
_____	_____
_____	_____

Background Information

After the obvious symptoms of moisture problems have been identified, the next step is to obtain as much information as possible about the structure and how it is used. Except in rare cases moisture problems don't appear overnight. This background information will help you interpret the symptoms and determine possible causes of moisture problems.

To define the problems, investigate:

- 1.The building components and use
- 2.Changes to the structure
- 3.The occupants behavior in the house

1.What kind of home is the structure? (Check all that are appropriate)

- | | | |
|---|---|--|
| <input type="checkbox"/> One Story | <input type="checkbox"/> Two Story | <input type="checkbox"/> Slab |
| <input type="checkbox"/> Basement | <input type="checkbox"/> Crawl Space | <input type="checkbox"/> Masonite Siding |
| <input type="checkbox"/> Brick Veneer | <input type="checkbox"/> Vinyl Siding | <input type="checkbox"/> Aluminum |
| <input type="checkbox"/> Wood Siding | <input type="checkbox"/> Shingle Siding | <input type="checkbox"/> Other _____ |
| <input type="checkbox"/> Stucco (Acrylic) | <input type="checkbox"/> Stucco (Natural) | |

2.How old is the home? _____

3.When does the mold or mildew appear to be the worst?

- All the time
- Summer
- Winter
- During rainy weather
- During hot weather
- During cold weather

4.How long has there been a problem? _____

5.Did previous occupants experience the problem?

- yes no don't know

6.What type of heating system is used? (Check all that are appropriate)

Type of system:

- Central Force Air _____
- Floor Furnace _____
- Wall Heater _____
- Fireplace _____
- Wood Stove _____
- Portable Space Heater _____
- Air Recirculation Fan _____
- Other, specify _____

Type of Fuel:

- Electricity _____
- Natural Gas _____
- Propane (LPG) _____
- Coal _____
- Wood _____
- Kerosene _____
- Other, specify _____

Duct System Location:

In slab floor _____
In attic _____
In crawl space _____
None _____
Other, specify _____

If you have duct system, is the duct system insulated?

_____ yes _____ no

7. What is the age is the heating system? _____

8. Are any rooms in the home closed off without heat?

_____ yes _____ no

With heat occasionally?

_____ yes _____ no

Comments: _____

9. What is the normal thermostat setting?

Day Degrees (F) _____

Night Degrees (F) _____

10. Are there hot areas or cold areas when the heating system is operating?

_____ yes _____ no

Locations: _____

11. Are portable gas space heaters vented indoors?

_____ yes _____ no

12. Is wet firewood stored inside or directly against the side of the home outdoors?

_____ yes _____ no

_____ Inside (wet) _____ Inside (dry)

_____ Outside (wet) _____ Outside (dry)

13. Is a dehumidifying device ever used?

_____ yes _____ no

If yes, which type is used?

Central _____

Portable or Window _____

Season(s) used?

Spring _____ Summer _____

Winter _____ Fall _____

Number of hours per day? _____

Relative humidity setting? _____%

Dehumidifier location and comments: _____

14. Is a humidifier ever used?

_____ yes _____ no

Has one ever been used?

_____ yes _____ no

If yes, which type is used?

Central _____

Portable or window unit _____

Season (s) used?

Spring _____ Summer _____

Winter _____ Fall _____

Number of hours per day _____

Machine Setting

High _____ Medium _____ Low _____

Humidifier location and comments: _____

15. Is an air conditioner ever used?

_____ yes _____ no

If yes, which type is used?

Central _____

Portable or window unit _____

Season(s) used?

Spring _____ Summer _____

Winter _____ Fall _____

Number of hours per day? _____

Temperature Setting Degree (F) _____

Air Conditioner location and comments: _____

16. Is propane, LPG, or natural gas used for cooking?

_____ yes _____ no

If yes, is a vented range hood installed?

_____ yes _____ no

Where is the range hood vented?

_____ into the attic _____ to outdoors

17. Are windows single or double pane?

_____ single ___ double

Is frame type?

_____ wood _____ metal

Are storm windows used?

_____ yes _____ no

Is frame type?

_____ yes _____ no

Comments: _____

18. Do windows fog over even though they have two or more panes of glass?

_____ yes _____ no

Where is fog located?

Inside surface _____

Between panes _____

19. Is indoor air circulation or ventilation restricted in anyway?

_____ yes _____ no

Are heating ducts closed?

_____ yes _____ no

Are room doors closed?

_____ yes _____ no

Does furniture cover vents?

_____ yes _____ no

Comments: _____

20. Does the attic and/or crawl space have cross ventilation?

_____ yes _____ no

Are there soffet vents present?

_____ yes _____ no

Are there ridge vents present?

_____ yes _____ no

Give the number of vents and their dimensions:

Attic: _____ Number _____ Size

Type and Location: _____

Crawl space: _____Number _____ Size

Type and Location: _____

21. Is ventilation in crawl space and attic unobstructed by stored materials, debris, duct work, plants, etc.?

Attic:

_____ yes _____ no

Crawlspace:

_____ yes _____ no

22. Are vents in crawl space left open year round?

_____ yes _____ no

23. Is crawl space higher than outside surface grade?

_____ yes _____ no

24. Is there a gap between attic insulation and roof sheathing, for air circulation?

_____ yes _____ no

25. Are there vapor barriers in the home?

_____ yes _____ no

Where are they located?

Ceiling _____

Walls _____

Floor _____

Foundation _____

Comments _____

26. Where are vapor barriers located in exterior walls?

Next to inside of wall _____

Next to outside of wall _____

Both inside and out _____

Comments: _____

27. Is a Polyethylene ground cover vapor barrier used over the soil in the crawlspace?

_____ yes _____ no

If yes, how much of the ground covered? _____

Location: _____

Is the plastic smooth on the ground?

_____ yes _____ no

Is the plastic 4 to 6 mil polyethylene?

_____ yes _____ no

If no, is there evidence of moisture in the crawlspace?

_____ yes _____ no

Home With Gutter System

28. Is overhang less than 18 inches?

_____ yes _____ no

29. Are gutters clean and in good repair?

_____ yes _____ no

30. Does downspout to drainpipe system remove rain water from gutters?

_____ yes _____ no

31. Is drip edge flashing installed on roof edge?

_____ yes _____ no

32. Is there standing water around the home's foundation?

_____ yes _____ no

If yes, is clay tile or flexible pipe used to conduct gutter water underground to release outlet away from house?

_____ yes _____ no

33. Are splash blocks used to release water at least 5 feet from house?

_____ yes _____ no

If yes, what material are splash blocks made of?

_____ masonry

_____ concrete

_____ plastic

_____ other (specify) _____

Home Without Gutter System

34. Is overhang at least 30 inches wide?

_____ yes _____ no

35. Is drip edge flashing installed at roof edge?

_____ yes _____ no

36. Is ground surface underneath roof edge covered with gravel or other ground cover to absorb runoff and reduce splash?

_____ yes _____ no

37. Do porches, patios or decks slope away from home to promote good drainage?

_____ yes _____ no

FLASHING

38. Is drip edge flashing applied to all roof edges and tops of all windows and doors?

_____ yes _____ no

If no, where is it missing? _____

39. Is flashing installed wherever roofing meets siding?

_____ yes _____ no

40. Are siding joints flashed?

_____ yes _____ no

41. Is flashing installed underneath all exterior doors and windows?

_____ yes _____ no

42. Is the top of foundation walls flashed to prevent water from wicking through the foundation block?

_____ yes _____ no

43. Does prefabricated chimney have flashing cap that extends several inches down all sides?

_____ yes _____ no

Homes With Basements

44. Is any part of the basement air conditioned or heated?

_____ yes _____ no

45. Is any part of the basement a finished living or recreational area?

_____ yes _____ no

46. Is the basement used as an area to dry clothes?

_____ yes _____ no

47. Has the ground next to the outside of the foundation settled?

_____ yes _____ no

48. Are there any plumbing leaks in the basement?

_____ yes _____ no

49. Is a bath or laundry room in the basement?

_____ yes _____ no

50. Where does the air conditioner condensate drain empty? _____

51. Are cold and hot water pipes insulated?

_____ yes _____ no

52. Do any kitchen, bath or laundry vents exhaust into the basement?

_____ yes _____ no

53. Are there any windows, outside doors, or other means of ventilating the basement to the outside?

_____ yes _____ no

54. Is insulation installed between the floor joist over the basement?

_____ yes _____ no

55. Are the basement walls insulated?

_____ yes _____ no

56. Do basement windows have storm windows over them?

_____ yes _____ no

57. Does the basement floor have insulation around the edge?

_____ yes _____ no

58. Does the basement floor have insulation under it?

_____ yes _____ no

59. Does the basement floor have a vapor barrier underneath?

_____ yes _____ no

60. Is a perimeter drain installed around the foundation?

_____ yes _____ no

61. Does outside grade slope away from the house on all sides?

_____ yes _____ no

62. Is the basement open to a crawl space?

_____ yes _____ no

63. How much of the basement floor edge is less than 2 feet below the outside grade?

64. Is the below grade portion of the foundation wall waterproof on the outside?

_____ yes _____ no

Changes To The Building Structure

Modifications to a home can cause changes in ventilation and air circulation affecting moisture movement. Have any building changes been added in the last two years?

65. What energy conserving/weatherization measures have been made within the past two years?

Caulking/weather stripping? _____ yes _____ no

Where? _____

Insulation added? _____ yes _____ no

Where? _____

Vapor barriers installed? _____ yes _____ no

Where? _____

Storm Windows added? _____ yes _____ no

Where? _____

66. Has the home been remodeled within the past two years?

_____ yes _____ no

Comments: _____

67. Have any changes to the heating/cooling system been made?

(For example: new humidifier, air conditioner or furnace installed?)

_____ yes _____ no

Comments: _____

68. Do landscape plants block free air flow through crawl space vents?

_____ yes _____ no

69. Is mature foliage no closer than 3 feet from foundation?

_____ yes _____ no

70. Are finished planting beds and mulches lower than ground level in the crawl space and sloped away from the house?

_____ yes _____ no

Occupant Behavior

The lifestyle of occupants can also have a significant impact on moisture balance. Except for the first two questions, “yes” answers indicate that the home receives moisture from the sources which can be controlled through behavior changes.

71. Is an exterior vented exhaust fan used or window left open during bathing?

_____ yes _____ no

72. Does the kitchen have an exterior vented exhaust fan?

_____ yes _____ no

73. Are wet towels hung in a confined area indoors to dry?

_____ yes _____ no

74. Are containers of foods uncovered (without lids) during the cooking process?

_____ yes _____ no

75. Are clothes dried on a line indoors?

_____ yes _____ no

76. Is clothes dryer vented into the living space or crawl space?

_____ yes _____ no

77. Are floors mopped frequently?

_____ yes _____ no

78. Are large open terrariums, hot tubs, aquariums, or spas present?

_____ yes _____ no

79. Are large numbers of houseplants present?

_____ yes _____ no

Analyze the Problem

Use background information to identify moisture problems in the home. Now initiate a thorough search and begin diagnosing problem. Be careful because a single symptom of excess moisture may have multiple causes and multiple symptoms may result from a single cause.

The most important tool for analyzing moisture problems is the moisture balance principle. Four factors must remain in balance to prevent moisture problems.

These factors include:

1. The source of moisture
2. The difference in temperature between outdoor and indoor air.
3. The movement of air and water

4.The best means to ventilate spaces

Solutions depend upon a balance of structural, mechanical, and behavioral changes in the home.

Begin searching for the causes of the symptoms of moisture problems you have already identified. The search must be thorough and systematic. Make sure you have obtained the answers to all the questions in the “Background Section” of this audit. Start looking for causes at the location of the symptom, and move systematically away from it. Make sure you have covered the entire house from attic to basement, crawl space, or slab, inside and out, before you have finished.

Remember:

- 1.Problems may have existed for a long time but are just now noticeable.
- 2.Not every problem has only one cause or the same remedy for all cases.
- 3.Various experts have different theories, opinions and solutions for some of these problems.
- 4.Determine carefully which arguments are appropriate to your location’s climate, housing construction type, and the products you have available for correction.

Determine Possible Solutions

The following corrective and preventive options for moisture problems will be useful in providing possible solutions.

Reduce the sources:

- 1.Stop water and plumbing leaks.
- 2.Correct site drainage problems.
- 3.Change occupants behavior.
- 4.Tray a dehumidification process

Watch the temperature differences:

- 1.Warm up cold surfaces with circulation ventilation, storm windows, or window coverings.
- 2.Insulate cold surfaces, such as walls, windows, ceiling, basements and crawl spaces.
- 3.Raise temperatures above the dew point to avoid condensation.

Reduce Moisture Transfer:

- 1.Caulk and seal air leaks.
- 2.Stop capillary action with ground moisture vapor barriers.
- 3.Consider using tightly installed vapor barriers when adding insulation in walls.
- 4.Protect and seal exterior surface cracks and leaks and provide moisture proofing.
- 5.Increase moisture resistance with wood preservatives, sealers and proper finishes.

Eliminate or reduce trapped moisture areas:

- 1.Increase air circulation using natural or mechanical ventilation to accelerate drying.
- 2.When arranging home furnishings, allow enough room for proper air movement.

3. Use permeable materials and correctly sized venting to allow the cool side of insulated walls, ceilings, and floors to breathe.

Correct the Problem

Remember these considerations:

1. Start with the easiest, lowest-cost remedies which address the most pressing problems.
2. Behavior modifications such as using exhaust fans in kitchen and bathrooms are cheap and easy to make remedies.
3. Consider making necessary mechanical adjustments or repairs to reduce moisture sources.
4. As a last resort, make structural changes that are necessary to halt moisture problems (retrofitting vapor retarders, damp proofing foundation walls, etc.)
5. Have homeowner obtain at least three estimates from reputable contractors before making structural changes.

The last page of this audit is designed to assist as you give homeowners a report on moisture problems in their home. Rank the tasks and problems in order of importance. Encourage the homeowner to complete them in order to solve the moisture problems identified.

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Adapted from:

A Home Moisture Audit Process, by S. W. Williams, M. K. Autrey, S.L. Harp, and R. L. Huhnke, Oklahoma Cooperative Extension Service.

The Billion Dollar Thief: Moisture, by L. L. Gardner and R. Rowe, Clemson University Cooperative Extension Service.