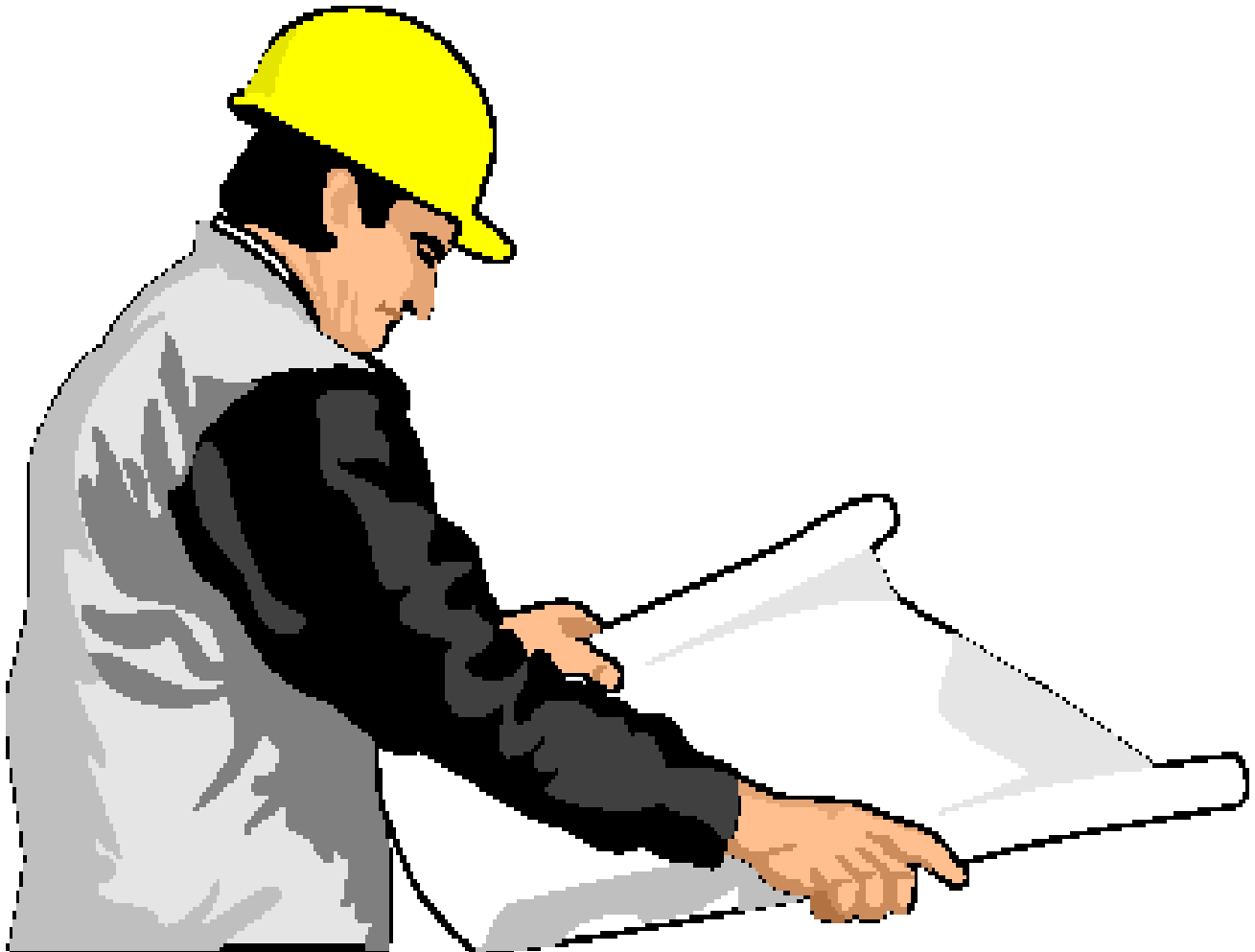


# CHAPTER 6

## THE INSPECTION



**"I ain't afeard uv snakes, uv toads, or bugs, or worms, or mice;  
an 'things 'at girls are skeered uv I think are awful nice!"— Eugene Field, Children's Poet  
Eugene would make a good true IPM pest control inspector — S.L.T.**

## LOCATING AND MONITORING PESTS

**Your decision if and when to use any control method(s) (even non-toxic or least-toxic controls) should be based first on safety and common sense and need, then on pest biology, inspection results and finally on anticipated economic, aesthetic or medical loss. Thoroughly inspecting** an area where pests or their damage is observed involves careful and thorough searching in and around the entire structure for signs of the pest and conditions that encourage its buildup. **Monitoring is** a systematic record keeping of observed pests or pest signs over a period of time. Monitoring may help you detect unwanted pests and determine where pests are coming from and where they are living. Monitoring is also helpful in evaluating any control programs. **Remember, when you inspect, no place can be private or “off limits”.**

### Why do pests enter a building?

#### 1. Attraction.

- Food** Human (and/or pet) food, whether in an edible form or in an inedible condition due to spoilage, attracts many rodents and insects. Nonhuman/pet food, such as woolen rugs and stuffed animals attracts clothes moths and carpet beetles, respectively. Wooden pallets are attractive to wood boring beetles and termites. House plants in the office attract many insects such as aphids, scales, and thrips. Dead insects attract dermestid beetles.
- Light** Incandescent and mercury vapor lights, particularly the latter, attract various kinds of insects.
- Odors** Paints and oil have attracted insects. The odor of wine also attracts certain insects, such as the leadcable bore, *Scobicia declivis*, which will bore holes into the corks of wine bottles and the bungs of cask.
- Color** The color of walls and of cartons containing food may also attract insects. An example is the yellow color to which certain types of aphids are attracted.
- Water** A pool of water or dripping water will attract insects or rodents needing moisture or humidity.

#### 2. Shelter.

Inclement weather, such as extreme heat, or cold, or rain or drought will force pests inside.

#### 3. Transportation.

Pests are carried into the premises when incoming goods inspection is poor. Some of the insect infested foods are missed by the eyes of the sanitarians. Wooden pallets are rarely inspected for termites and hide beetles which may be hiding or infesting the pallets. Also, employees with lunch pails may carried infested food.

**TOOLS FOR INSPECTION.** Remember - Inspect first - work second. The following articles are suggested for your rodent, fungi and insect inspection(s).

1. Bendable knees, a pencil, a mirror, a clipboard, grid paper, a graph of the building and landscaping, a level and a measuring tape. You might want a pocket-size tape recorder for notes.
2. A ladder for inspecting roof trim, roofing, flashing and other items above ground.
3. A stepladder for gaining access to attics, eaves, eaves troughs, soffits, vents, etc.
4. Tools for gaining entrance to crawl spaces, wall voids, attics, etc. and knee pads.
5. A hacksaw blade for checking earth-filled porches adjacent to crawl spaces.
6. A bright flashlight and spare batteries and bulbs and a magnifying glass and mirror.
7. Specimen containers and glue boards. A business card for checking cracks.
8. A hammer and ice pick or similar instruments for sounding and probing wood.
9. Two screwdrivers (flat and Philips) and pliers or similar instruments.
10. Coveralls, bump helmet, respirator and gloves for entering crawl spaces and attics.
11. A moisture meter with a range of at least 15% to 24% moisture.
12. A stethoscope for listening, binoculars for looking, and canned air for flushing.
13. A red or yellow light for night-time inspections.

The moisture content of wood should always be below 20%. Use the meter to check the moisture content of any wood where there are visible stains and/or where moisture problems are suspected. Temperature corrections should be applied to the moisture content readings taken below 70° F. and above 90° F. (correction tables are supplied with meters). Note: The moisture meters can not be used accurately on wood treated with water-borne wood preservatives or fire retardants.

## EXTERIOR INSPECTION



**Procedure for Inspection** - Your inspection should include a thorough examination of the landscaping, the exterior of the building both at and above grade level; the interior living areas; the attic, and the slab, crawl space or basement where applicable. Interview all of the occupants you see during your inspection to gain useful information on previous or existing rodent, insect and fungus problems, water leaks, etc.

**The first step** of a proper inspection is to make a complete circuit of the exterior, carefully recording on a graph of the building and landscaping, the exact dimensions of the building, including garages, courtyards, parking lots, porches, patios, carports, etc. This will help you locate inaccessible areas that might be hidden and overlooked inside, when you make the inspection of the interior. Prior to beginning your inspection, establish the history of the building and prior pest infestations/ damage. Ask questions like:



- ❖ What, where, and when have there been pest problems/damage in the past?
- ❖ How much damage was done?
- ❖ Who, where and what was done historically to solve the problem?
- ❖ Has the pest problem continued after the "treatment"?
- ❖ Where are the records of all previous inspections and "treatments"?
- ❖ What is being done currently to remediate conditions, infestation(s) and damage(s)?
- ❖ What pesticide poisons were used?
- ❖ Where are the inaccessible areas?

**Look for signs of excessive moisture.** The lot should be graded so that water drains away from the building and downspouts should be clean and discharge water away from the building, not into or against it. In crawl space construction, check whether or not the vents give satisfactory cross ventilation. To do this, they must be left open and properly screened in the summer. Wherever wood is in contact with or close to the soil, correct these conditions conducive to infestation, but first check it carefully for signs of insect attack and decay. This will require not only careful visual inspection, but you need also to carefully probe and sound the wood members of the structure with a hammer or similar instrument. Pay particular attention to wood columns and steps, piers, porches, steps, decks, doors, door frames and siding, and stuccoed walls, pilasters and arches close to the soil. Note all areas where untreated wood is damp, damaged or in direct contact with or too close to the soil, then correct all these conditions conducive to infestation later. Find and repair all leaking plumbing. Did you know one leaky faucet can waste 6,000 gallons of water a year in addition to creating moisture problems?

**Look for and note rodents, insects, termite mud tubes and other arthropod signs visible** on or near the foundation walls, in cracks in the walls and between the main foundation and attached slab, behind shrubs or other vegetation, and in firewood, formboards and foam insulation and note all garbage, trash, clutter, moisture problems, inaccessible areas, conditions conducive, holes or debris near or against the building, etc. Also look carefully for evidence of active or previous pest activity in planters, gardens and in wooden structures such as fences, fence posts, trellises, etc. against the building(s). Plumbing inspection doors in slab-on-ground houses, meter boxes and crawl space access doors should be examined carefully for evidence of past or present rodent or insect attack and decay. Check for the presence of foundation waterproofing below grade on basement walls. Don't forget to look for drill marks and other signs of previous *treatments*.

**Finally, determine if walkway, porch and patio slabs slope and drain water away from the building.** This can be done easily by pouring water on the slab and noting the direction of run-off or use a large beach ball or level. Carefully note all standing water, debris, vines, weeds, mold, damaged eaves troughs, open doors, garbage and other problem areas you see.

**Take a deep breath** - You can smell heavy roach and rodent infestations. Even fresh food attracts pests; rancid food indicates a sanitation problem. Be sure you carefully inspect and note pavement cracks, pit areas, grease drums, pipe penetration, parking lots, recycle bins, hoses, overhangs, RR tracks and ties, dust collectors, roofs, dumpsters, defective louvers or windows, empty pallets, compactors, stored equipment, lighting, type of vegetation, vents, bait stations, doors, sheds, ponds and streams. Nearby cornfields, when harvested, may cause rodents, e.g., field mice to vacate to the nearest building.

**Flowering plants** on the outside of a structure give a splash of color to a drab landscape. Unfortunately, the flowers may also draw certain insects to them to feed on the nectar and pollen. Carpet beetle adults feed on the pollen in the flowers. If these flowers are in close proximity to windows that are usually open during periods of warm weather, the pests have an easy point of entry. Even with the most meticulous inspection and screening of windows, doors and other potential points of entry, some pests may still get into the facility. Flowers colored purple, bright yellow, or white really attract insects and should be kept away from the structure. Strip nearby fruit and nut trees in order to remove bird and rodent forage sites. Trim all trees, bushes and vines at least 12 inches. A good rule of thumb for all landscape plantings is to establish and maintain a 12 to 24 inch vegetation free zone all the way around a building. This vegetation free zone eliminates the cover that insects and rodents desire. The open area will also allow the soil to dry out, discouraging certain insect populations such as earwigs, sowbugs/pillbugs and oriental cockroaches. Plants should be routinely observed for vigor and growth.

Whenever food sources, rodent signs, insect attack, decay, conditions conducive to infestation, excessive moisture, or untreated wood in contact with or near the soil area are noted, they should be carefully recorded on your inspection report and corrected. The type and extent of damage should also be recorded and corrected. Environmental conditions, e.g., temperature and moisture levels, especially humidity, are often important clues in predicting when a pest outbreak will occur or hit threshold levels. By the way, the filthiest thing in your building often is the dishrag or sponge; it often is full of salmonella and lots of other disease-causing pathogens. Microwave them wet for 5 minutes or let them dry out for at least 3 days. **Usually the simplest solution to any pest problem is the most earth-friendly.**

### **SOME WATER SOURCES**

Our dripping plumbing and overwatering of plants provides more than an adequate water supply for most insects. Typical water sources include rest rooms (sinks, urinals and toilets), custodial closets, water faucets, kitchens, coffee makers, bottled water dispensers, water fountains, water leaking indoors from outside, sweating or leaking pipes or fire extinguishing systems. All of these areas should be investigated for leaks and sweating and any repairs made immediately. Standing water in the building will produce high humidity and subsequent mold, mildew, rodent and insect growth.

The moist basement of a building is a common source of water. Dehumidifiers may be used to control humidity, but they should be permanently drained into a drain or emptied daily. Objects may be sealed in polyethylene bags to prevent water damage. In storage areas without climate control, an unbleached muslin encased packet of silica gel conditioned to 50% RH should be sealed in the polyethylene bag with the object to keep the relative humidity constant. The silica gel will have to be checked periodically and reconditioned. A small hygrometer or humidity indicator strip can be placed in the bag to facilitate monitoring and reconditioning.

### **SOME FOOD SOURCES**

Food sources may found anywhere in a building. Wallpaper paste, forgotten rodent baits, soap, garbage, grease, crackers, candy, chips, muffins, bread crumbs, dead insects, rodents, wood, paper, glue, hair, nail clippings, and even the shed skin cells still on clothing may provide a more than adequate food source. The dirty sweater in the bottom drawer or the long overcoat left in the locker since last January and forgotten will provide wonderful food sources for moth populations to develop. Clean up and properly store away all potential food sources. Special attention should be paid to cleaning the kitchen and food areas; including lounges, lockers, old party drinks and trays, coffee makers, refrigerators and other appliances.



**Garbage is to pests what a shopping mall is to us.** The garbage area is typically a quiet zone, and pest populations can develop virtually unmolested or detected. Decaying garbage presents a health threat: Cockroaches and other insects will transport bacteria and germs on their bodies from the garbage area to your food.



Trash tends to support all types of pests and elimination of it is virtually impossible. However, control of where the trash is placed and frequency of removal is feasible. Whenever the garbage can or dumpster is emptied - rinse the container with a hose and spray it to the point of runoff with enzyme cleaners to virtually eliminate odors, flies and yellowjackets. When you sprinkle lightly or spray with borax or sodium borate you turn garbage residue into toxic bait.

**All trash cans should be lined with plastic trash bags.** These bags should be replaced daily whenever food material such as lunches, milk, sodas, and juices, have leaked onto them. Then the containers should be routinely cleaned with enzyme cleaners and borax.

### Exterior Inspection



As you examine the building's exterior, under rocks, carefully inspect all weather-stripping, seals, wood siding, windows and window frames, roof trim including gables, eaves, soffits and facias and any other exposed wood items for signs of leakage, openings, rodent/insect attack or decay. Insect exit holes, insects, sawdust, pellets, etc. caught in cobwebs or on window ledges, cracked or blistered paint and water stains are some of the most common signs of an active infestation. Window and door frames should be properly weather-stripped, screened, caulked and windows glazed. There should be flashing at doors, windows, at roof/wall and roof/chimney intersections, and pipes and vents projecting through the roof. The shingles should form a continuous drip edge over the eaves and rake. If gutters and downspouts are present, they should be clean

and free of leaks and rust. There should be proper ventilation in all parts of the attic through the use of soffit vents, roof vents, ridge vents and/or attic fans, depending on the roof type. **Note on the inspection report all visual evidence of decay and rodent/insect attack and/or sanitation problems and suggestions/repairs.**



### INTERIOR INSPECTION

Now enter the living area; **every room of the building should be examined systematically** for evidence of rodents, insects, food sources, decay and moisture problems. Your inspection should include not only a careful visual examination, but also record your careful probing and sounding of critical items and areas, such as the baseboards and/or areas where damage is suspected. Your inspection should start with the entrance doors



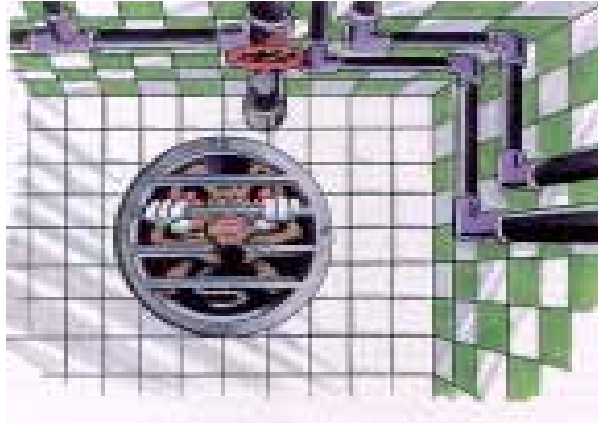
and their frames; continue with a thorough observation of the walls, ceilings and floors, inspection of baseboards and wood trim; and then carefully look in closets and showers, tubs, sinks, washing machines, etc. These should all be examined carefully for signs of leaks. For the shower, this is done by plugging the drain, running water into the shower stall, and seeing if the water leaks out within 15 minutes. All plumbing access areas should be carefully examined for leaks, termite tubes, rub marks, etc. The walls and ceilings should be examined for water stains, droppings, mud-like deposits which are sometimes built on exposed surfaces by Formosan subterranean termites working inside the walls, egg cases, and slightly raised areas on paint or wallpaper, which may hide pests, frass (sawdust)

from powder post beetles, carpenter ants, etc. If you detect high levels of humidity - properly install and maintain fans and dehumidifiers.

**The interior plants should be kept to a minimum** and be well maintained to prevent pest problems. Flowering plants should be avoided. Watering weekly should be sufficient to satisfy the needs of most plants. Plants should be inspected for insects at each watering. If fly problems are noticed, the soil should be changed immediately. All dead leaves and other debris should be routinely cleaned from in and around the pot.

**Plumbing drains should be properly covered and should be routinely sprayed with enzyme cleaners.** All plumbing should be properly maintained to stop moisture problems from developing.

**Cracks between baseboards and the floor and walls the perimeter of the building should also be inspected carefully.** The baseboards should be tapped and any hollow areas carefully probed and/or opened. Examination of the baseboard areas and of cracks built-in cabinets and door and window frames is particularly critical in slab-on-grade construction because insect, rodent and pest entry points are often hidden by floor coverings, interior finish and trim. Use air to flush them.



Pheromone an/or blunder type sticky traps can be used so that you will be able to continually monitor a room without being there. Pests will be attracted to or blunder into the traps as they move about the area in search of food, mates, or shelter. Pests found in the traps will indicate their presence in the area. Once their presence is known, you may increase the number of traps in an area to pinpoint where the actual infestation is located. The correct identification of the pest will aid you in your control efforts.

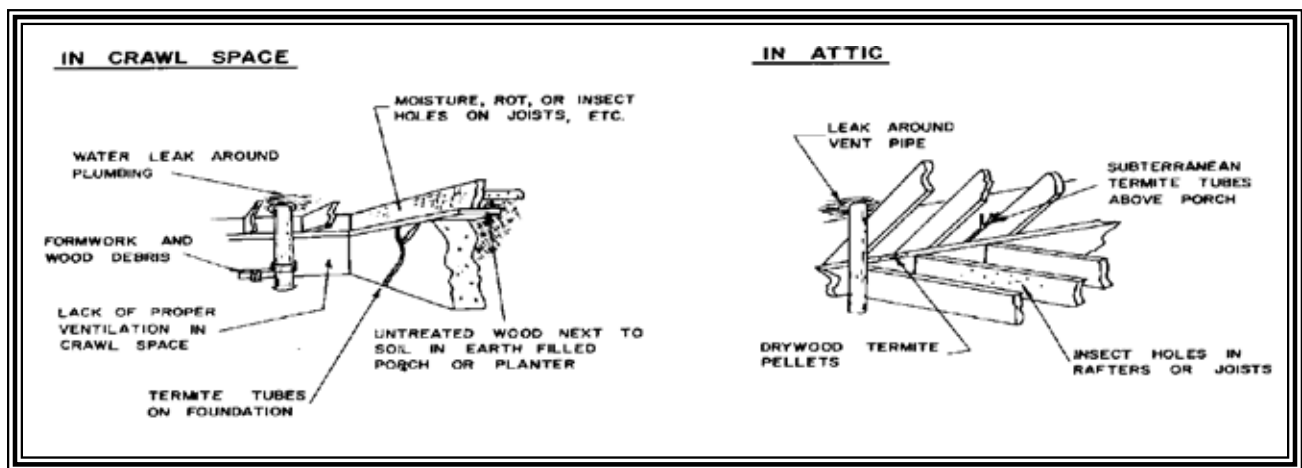
In trying to detect damage caused by insects inside the building **the observations of the local occupants can be very helpful** because they may have seen or removed rodents, rodent droppings, dead pests, sawdust or pellets produced by insects, etc. In areas where drywood termites occur, window sills, closet and cupboard floors, and the baseboards should be examined for damage and fecal pellets. The floors should be inspected not only for evidence of sagging, buckling, or settlement which would indicate extensive problems, but also for localized discoloration or depressions indicating limited insect or fungal attack. Oddly placed throw rugs, furniture, tables, etc., may hide such damage.



**Remember, if you are conducting a nocturnal or nighttime inspection, use a flashlight with a red lens or cover it with red cellophane** - insects, e.g., carpenter ants and roaches are not sensitive to light in the red spectrum - so use this to spot the pests and vacuum them up or follow back to their nest. The wave length of yellow light also will not excite insects.

## ATTIC INSPECTION

Attic inspection is often complicated because some or all of the space is inaccessible or hidden by insulation. **All inaccessible areas should always be noted on the inspection report.** The attic should be routinely inspected for signs of bats, droppings, decay, insect damage and water stains. Particular attention should be paid to the sheathing at the eaves, chimneys, vent pipes and t.v.. antennas for signs of decay, frost, rust or water stains. In regions with severe winters, decay or water stains on the sheathing at the eaves may be due to the formation of ice dams. Elimination of this problem requires improvement of the drip edge, ventilation and insulation the attic. Roof rafters, the ridge pole, ceiling joists, wood attic vents, and the top plates of all partition walls should be examined for evidence of insect attack, such as piles or pellets or sawdust, and for insect exit holes, rub marks, stains, droppings, etc. In regions where carpenter ants or termites are a problem, chimneys and areas over earth-filled porches should be inspected routinely and carefully. As with all other parts of the building, all damage or evidence of infestation or conditions conducive should be carefully noted on your graph and inspection report exactly where they were found.



## CRAWLSPACE/BASEMENT INSPECTION

The final major area inside your building which should be routinely and carefully inspected is the crawl space or basement. Although attics can be hot, difficult or even impossible to enter and properly inspect, the crawl space is normally the least pleasant area of the building to inspect. However, it is the area where fungi, rodents and insects most often invade and cause extensive damage without being noticed. Therefore, it must be examined carefully and routinely. **Wear protective clothing.**

During your crawl space inspection, the entire subfloor area should be checked systematically for signs of rodents, droppings, decay, insect attack, water stains, mildew, mold or sapstain, etc. Particular attention should be paid to wood next to earth-filled porches, planters, carports, patios, on the upslope side of buildings on sloped lots, and other areas where soil is close to the wood or where there is excessive moisture against the building. Also, wood under bathrooms, kitchens and utility rooms should be examined carefully for signs of water/sewage leaks. If mold or sapstain fungi are present on the wood, reduce the moisture content of the wood to less than 20%, and treat with sodium borate. Earth-filled porches and planters should be checked to ensure that there is a barrier between the soil and the sills or headers. This can be done by inserting a thin (hacksaw) blade at several points under the sills behind porches and planters. The blade should not penetrate beyond the sills or headers. **Wear proper protective clothing and a respirator.**

All perimeter foundation walls, pillars, interior walls, chimney bases and hearths and pipes making contact with the soil should be carefully examined and probed. **Cracks between the foundations and sills, joists and beams should also be inspected carefully and then caulked/sealed properly.**

The presence in the crawl space of water stains, standing water, wet foundation walls, wood debris, droppings, frass, pests, formboards, foam panels, tree stumps and untreated wood in soil contact should be noted. The presence of polyethylene or a similar soil cover should also be noted. **Clearance** between the soil and untreated sills and joists **should be at least 18 inches**; for beams the clearance should be at least 12 inches. Vents from dryers and condensate lines from air conditioning units should discharge outside the house; not in the crawl space. **All inaccessible areas should be noted, opened (if possible) and examined.**

In unfinished basements, the inspection procedure is similar to that for crawl spaces, except that it is usually much easier. An additional step required is that all wood touching the concrete should be inspected carefully for signs of decay or insect attack. A note should be made of any untreated wood structures which penetrate or are in contact with the (cracked) slab. Finished basements are inspected in the same way as living areas. However, if the basement has a suspended ceiling, panels should be carefully removed (and replaced) to inspect sills, joists and beams resting on the perimeter walls for evidence of insect or rodent infestations.

## SHED AND GARAGE INSPECTIONS

Attached and detached garages and storage sheds are the last areas which should be carefully examined. This is particularly important for attached structures because these also can provide direct entry for rodents, fungi, termites and other insects into the building itself. A thorough examination may be impossible because of the

accumulation of stored materials. All clutter and inaccessible areas should be noted on the inspection report.

### Summary and Interpretation of Inspection

Only after each part of the building has been carefully inspected and the presence of rodents, moisture problems, decay and insect damage, and all conditions which will allow such damage or invasion to occur, have all been carefully and thoroughly recorded; you can then decide what, if any, corrective action(s) should be taken. Any proper decision will require accurate identification of the cause of any damage, the type of insect, rodent, decay and all the conditions conducive, food sources and any source of moisture which allows this decay or pests to enter and grow. The recommended corrective controls and/or procedures should take into account the amount of damage, the potential for spread of the damage, and the likelihood of new damage occurring because of poor construction or control procedures. The objective of any corrective action should be first to protect people and the property and then to save money by preventing or controlling decay and insect damage. This usually can be determined quite easily for correction and control of existing problems.



Use extreme caution and careful judgment before utilizing any corrective (but dangerous) chemical controls designed to prevent possible future deterioration, particularly in existing buildings which have stood for several years without decay or insect attack despite its inherent faults in construction.

**Inspection Report Summary** - An essential part of your written report procedure is the accurate and thorough reporting of the results of your examination, and development of recommendations for prevention or control of fungus, rodent, bat, bird and of insect problems. Inspection reports should be simple to read, understand and complete, but at the same time they must present an accurate picture of existing and potential problems. Your report should include an accurate, anatomical diagram of the structure, showing damaged areas, active infestations and areas where damage will probably occur if no corrective control measures are taken. **A good written (and properly filed) report never forgets.**

In addition to containing the results of your inspection, your written record or report should list recommended corrective procedures which will either control or prevent decay, rodent, termite and/or and insect attack(s). The objective of any recommendation should be first to do any necessary controls as safely as possible; then secondly to save money by controlling or preventing future decay and pest attacks. **When corrective procedures are recommended, care should be taken to ensure that the safest and yet most economical procedures are used.**



## SOME SPECIFIC INSPECTION HINTS

### BUILDING EXTERIOR ABOVE GROUND LEVEL

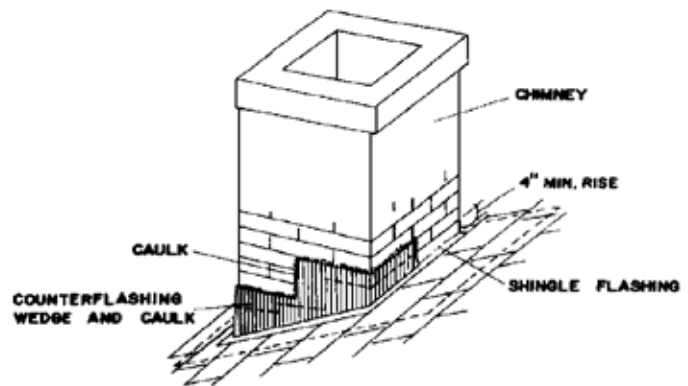
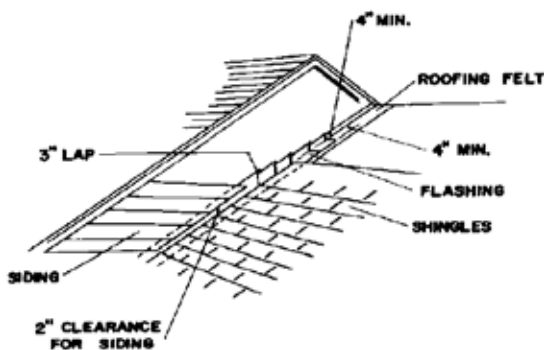
Look carefully at and note: rodent proofing, insect proofing, bird proofing, roofs, neighboring structures, lighting, etc.

#### Make a checklist and note

1. All doors and windows that are not properly glazed/screened.
2. All window and door frames that are not properly caulked/weather-stripped/sealed/rodent proofed.
3. Missing/damaged flashing/rodent/pest proofing:
  - a. around doors and windows
  - b. at intersections of different materials on the walls where exterior finish does not provide a self-flashing joint
  - c. at roof/wall intersections
  - d. at roof/chimney intersections
  - e. at pipes and vents projecting through the roof

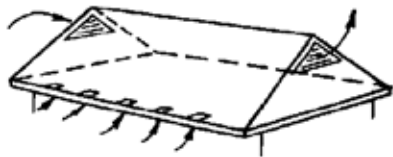
#### Corrective Procedures

1. Screen/glaze all areas around all doors and windows where they are absent.
2. Caulk/seal/weather-strip/rodent proof all areas around window and door frames where needed. Not only will you prevent pest entry, you will save energy and lower your utility bills.
3. Install flashing/rodent/pest proofing:
  - a. around doors and windows
  - b. at intersections of different materials on the walls where exterior finish does not provide a self-flashing joint.
  - c. at roof/wall intersections
  - d. at roof/chimney intersections
  - e. at pipes and vents projecting through the roof

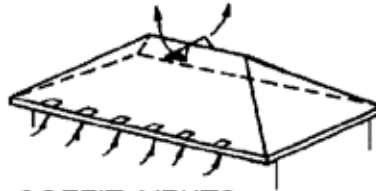


4. Carefully inspect rolled roofing, stakes and/or shingles and note the type - flat, gable, valleys, problems noted, e.g., standing water.
  - a. Shingles do not extend 3/4" beyond and form a continuous drip edge at the eaves and rake.
  - b. Shingles have mold/moss growing on them and/or debris.
  - c. Shingles are missing or at or beyond life expectancy.
  - d. Standing water or pooling/ponding noted.
  - e. Heating, air conditioning or other mechanical unit needs repair.
4.
  - a. Install shingles to extend 3/4" beyond and give a continuous drip edge at the eaves and rake or install flashing.
  - b/c. Remove mold, moss and/or debris; trim branches that touch or overhang the roof; reshingle and/or reroof if necessary.
  - d/e. Repair problems.

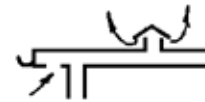
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| <p>5. Gutters are not provided where the roof overhang is less than 12" in width for 1-story buildings, or 24" in width for 2-story buildings.</p> <p>6. Gutters leak or are blocked by leaves or other trash.</p> <p>7. Downspouts leak.</p> <p>8. There is not adequate ventilation in the attic, e.g., mold, decay, rust, frost noted, etc.</p> | <p>5. Install gutters and downspouts properly.</p> <p>6. Repair leaks in gutter and remove leaves and other trash.</p> <p>7. Repair leaks in downspouts.</p> <p>8. Install gable vents, ridge vents, soffit vents, roof vents and/or fans, as appropriate, to give a free ventilating area of at least 1 sq. ft. per 150 sq. ft. of horizontal floor area in the attic. This can be reduced to 1 sq. ft. per 300 sq. ft. only if a vapor barrier is properly installed on the warm side of the ceiling, and/or at least 50% of the ventilating area is provided with fixed ventilators in the upper portion of the space to be ventilated, with the remainder provided by soffit, ridge, roof or gable vents.</p> |
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SOFFIT VENTS  
OPTIONAL



SOFFIT VENTS  
NECESSARY



SOFFIT VENTS  
NECESSARY

- |  |   |
|--|---|
| <p>9. There is evidence of rot, decay and/or water damage in columns, arches, wood siding, windows and window frames, doors, door frames and sills, wooden steps, decks, steps, roof trim - gables, eaves, soffits, fascia, etc.</p> <p>10. There is evidence of insect, rodent or fungus attack in wood siding.</p> | <p>9. Determine the source of moisture which allows this damage and decay to occur, and eliminate it. Trim all branches that touch or overhang the building. Replace structurally weakened wood with sound, untreated wood where the source of moisture can be eliminated, or with preservative-treated wood where it cannot be eliminated. Where slight decay has occurred at window and door frame joints. In wood steps, in window joints and cross-cut surf faces of siding and roof trim, brush or spray on a good wood preservative and water repellent solution to reduce the rate of decay (do not apply to painted surfaces). Decay is commonly associated with the absence of caulking or glaze around window and door frames and windows, no flashing at roof/wall intersections, eaves and rake, or around doors and windows, and shingles not extending beyond the eaves and rake to form a continuous drip edge.</p> <p>10. Identify the type of insect, rodent, fungus from the type of damage present, for example, rub marks, termite tubes, insect exit holes, droppings, gnawings, sawdust, pellets, etc. and initiate the correct control procedures. All structurally weakened wood should be replaced as a part of your control procedures.</p> |
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|---|---|
| 11. There is evidence of improper drainage.   | 11. Properly install eaves troughs, drain tiles and/or slope the soil away from the foundation at least 1" per foot.  |
| 12. There is evidence of in the neighborhood and/or surrounding environment (any nearby areas or buildings are conducive to pests?)   | 12. Correct all conditions you can and call the health department for those problems off property you cannot control. |
| 13. There is evidence of pest harborages under objects lying or stored directly on the ground; food spillage along railroad sidings and shipping and receiving docks, and/or garbage handling systems (storage, containers, cleaning methods and trash disposal/handling. | 13. Remove and correct any/all conditions conducive to infestation/damage.  |
| 14. There is evidence of branches touching or over hanging the building, visual weeds, insects, rodents, bats, birds and/or other vertebrates.  | 14. Pest proof the buildings; initiate and practice proper <b>IPM</b> pest controls.                                  |
| 15. There are lighting problems found, e.g., mercury vapor or regular bulbs being used outside.   | 15. Install sodium vapor, yellow bug lights or move lighting or turn off at night.                                    |
| 16. General Building Problems   | 16. Note type of construction, cracks and crevices, type of siding, maintenance problems.                             |

#### **INSIDE THE LIVING AREA AND ATTIC**

**Make a checklist, carefully inspect walls, floors, ceilings, cleanability, pits, floor drains, plumbing, ventilation, condensation, lighting and note:**

**Correct Procedures**

- |  |  |
|--|--|
| 1. If there is evidence of water stains, mildew or mold growth anywhere.       | 1. Determine the source of moisture. If there is a plumbing or roof leak, repair the plumbing or roof. If there is excess moisture in the building eliminate it by, for example, venting moisture in bathrooms, kitchens and utility rooms to the outside; improving ventilation, drainage, or installing moisture barriers in the crawl spacer; or using dehumidifiers. If vapor barriers on insulation in the walls are absent, or placed towards the outside of the house, reverse the position of the vapor barrier where practicable, or apply an aluminum paint on the living area side of walls. In areas of the country with severe winters, water leakage into walls and interiors of houses is sometimes caused by ice dams. If this is the source of moisture, improve ventilation and insulation in the attic. |
| 2. If the floor sags or is buckled or if the floor drains or floors are dirty. | 2. Determine the cause of the problem. In crawl space houses if there are insufficient supports under the floor, install more supports. If there is decay or insect attack in the subfloor, correct as needed. If buckling is due to water leaks, eliminate the leaks. Replace all structurally weakened wood and delaminated plywood. Practice proper sanitation.   |

3. If there are gaps between the floor and baseboards and/or cracks, crevices and/or other openings in walls.
4. If there is evidence of any water leaks/stains.
5. There is no access door to attic.
6. There is evidence of decay/insect/rodent attack in windows and window frames, doors, door frames and sills, wood baseboards, wood flooring, walls, etc.



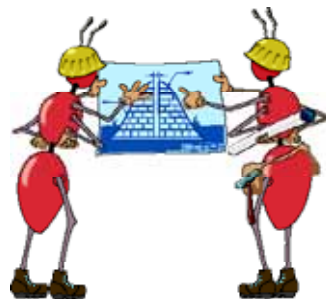
3. If they are due to drying of wood, caulk all openings, cracks and crevices and gaps. If they are due to settlement of the floor in crawl space houses, correct as needed.
4. Repair any/all leaks in plumbing, replace caulking and/or grout in showers around pipes and around sinks and tubs.
5. Provide an access door to the attic. Note any inaccessible areas in the attic in the inspection report.
6. Determine and eliminate the source of moisture which allows decay to occur. Replace structurally weakened wood with sound untreated wood. Decay is commonly associated with the absence of caulking or glaze around window and door frames and windows, or plumbing leaks. If there is extensive decay away from an obvious source of moisture, suspect the water-conducting fungi *Poria incrassata* or *Merulius lacrymans*. If either of these are present, great care must be taken to find and eliminate the source of the fungus. Identify the type of insect/rodent from the type of damage present, for example, gnawing, termite tubes, insect exit holes, sawdust, pellets, etc. and initiate the correct control procedure. All structurally weakened wood should be replaced as part of the control procedure. Properly seal, weather-strip, glaze and/or screen where needed. Make sure windows are opened regularly.

7. There is evidence of rain seepage or decay, rodents, bats, and/or insects in the attic sheathing (particularly around vent pipes and t.v. antennas), rafters, joists, wall top plates, etc.

7. Determine and eliminate the source of moisture; identify and correctly control the rodents and/or insects. Replace structurally weakened wood with sound untreated wood. Rain seepage or decay is commonly associated with leaks around vent pipes and t.v. antennas or through broken shingles. Decay may be due to excessive moisture in the building. This should be eliminated. In areas of the country with severe winters, water leakage is sometimes caused by ice dams. If this is the source of moisture, improve ventilation and insulation in the attic.

8. Inspect all pipes, water sources, custodial closets, boiler/steam vents, mechanical rooms, electrical rooms, gyms, staff lounge areas, offices, work stations, utility rooms, lockers, rest areas, food preparation and storage areas; check to see if all materials are properly stored and kept 15 - 18 inches away from walls. If everyone is following proper stock rotation practices, e.g., first in, first out, no permanent food storage in the preparation areas. If there is proper sanitation, segregation, repackaging, storage and adequate and thorough housekeeping.

8. Correct as needed.



Are people eating, drinking or smoking in these areas; are plastic can liners being used and emptied regularly? Is paper being stored in these areas? Is there any evidence of dust, debris, flowers, food, drinks, tobacco, dirty appliances, plumbing leaks signs of pests and or damages visible?

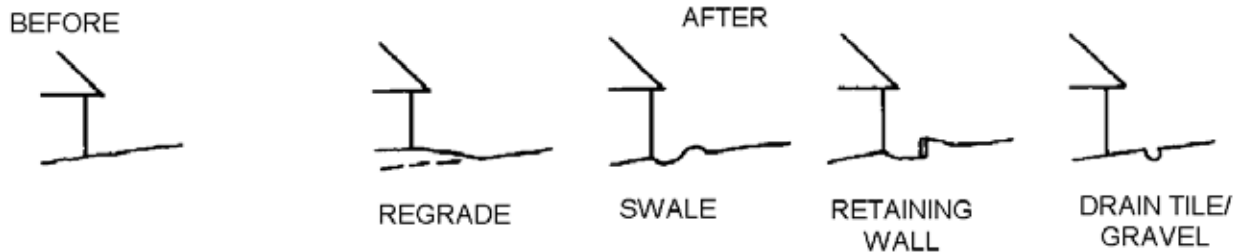
Are there any visible dirty and/or empty containers? Are all susceptible products either in refrigerators, freezers or tightly sealed containers? Are damaged goods being properly segregated? Are all susceptible goods in either freezer or refrigeration storage? Is there adequate ventilation and thorough housekeeping around equipment, counters and food preparation surfaces? Can all enclosed areas be easily opened and cleaned? Describe all storage practices and garbage/debris disposal and/or condensation and/or general sanitation problems you see. See if the area beneath and behind vending machines are clean. Inspect all utility areas to see they are clean and neat.

9. The vapor barrier on insulation is on the side of the insulation towards the outside of the building, not the living area.
9. Reverse the vapor barrier if it is placed towards the outside of the house, not the living area. If this is not practicable apply an aluminum paint on the living area side of walls where the vapor barrier is incorrectly applied (in the Gulf Coast area it is advisable to omit all vapor barriers in the walls and ceiling).
10. The elevator shafts, dishwashing areas, inside garbage and trash areas, toilets and locker rooms, lunch rooms, utility, office and public areas have an accumulation of debris, old clothes, trash or other filth, improper ventilation and/or moisture problems that can provide food, moisture or harbor age for insects and/or rodents and/or are not routinely and properly emptied, cleaned, stored and/or covered.
10. Practice proper sanitation.
11. Note all visible condensation (does it provide a breeding area for flies or other pests?) Do lights attract insects into the building? Railroad track areas (if spurs come into the building, is the area kept clean?) Screens, windows, doors = are they rodent and insect proof and do they shut tightly?
11. Correct as needed.

Inspect around the exterior of foundations, basements, slabs and crawl spaces (including crawl space areas in ranch, multi-story, half-basement and split-level houses. Carefully look at and for the: absence of pest harborage(s), absence of pest breeding area(s), garbage handling systems, garbage storage area, garbage containers, garbage container cleaning, trash disposal, paving and drainage problems, weed control, perimeter rodent control.

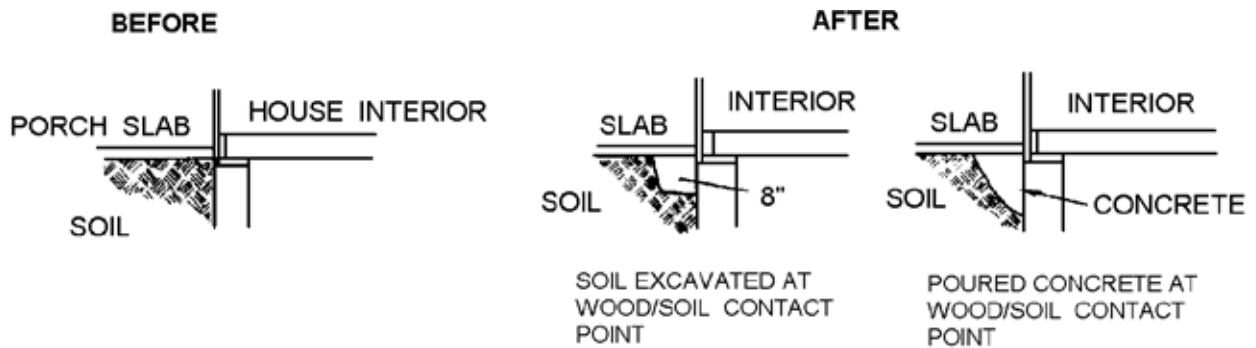
**Around the foundations of basements, slabs and crawl spaces your inspection finds: Suggested control/correction procedure:**

- |  |  |
|--|--|
| 1. Surface water drains towards the house, not away from it. | 1. Alter surface drainage so that water runs away from the building by regrading the lot; by building a retaining wall or swale, or by installing drain tile and/or gravel to intercept water before it reaches the house. |
|--|--|



- |  |  |
|--|--|
| 2. Walkway, patio and porch slabs slope towards the house, not away from it.   | 2. Change the slope of the slab to direct water away from the building. If this is not practicable, caulk all cracks between the slab and the wall of the house to prevent water seepage under the house.  |
| 3. Rain water from the roof drains under the building.   | 3. Drain water away from the building with gutters, downspouts and splashblocks; by regrading; or by attached drain tile to downspouts to deposit the water in a storm sewer, dry well or other location where it will not run under the building.                                   |
| 4. Firewood and lumber piles are less than 6' away from the building.  | 4. Move firewood and lumber piles so that they are at least 6' away from the building.   |
| 5. Form boards, grade stakes, wood debris and paper products have been left around the building  | 5. Remove untreated wood form boards and grade stakes, wood debris and paper products. Otherwise they may provide an entry point for fungi and insects.  |
| 6. Any other wood in contact with the soil and/or wood exposed to a high risk of decay or insect attack is not preservative treated or naturally resistant, or not stamped with the appropriate quality or grade mark. | 6. See appendix for wood items which should be pressure treated or naturally resistant. Replace untreated wood if practicable. Alternatively brush it with a wood preservative/water repellent solution, e.g., sodium borate and (Co-Pel) sealer and/or drill and insert Impel Rods. |
| 7. Wood siding is less than 6" above outside grade.  | 7. Lower grade so that soil is 6" below wood siding, but prevent rain water from draining under the house.   |
| 8. Untreated wood framing is less than 8" above outside grade.   | 8. Lower grade so that soil is at least 8" below untreated wood framing, but be careful to prevent rain water from draining under the house.   |

9. Untreated wood framing is less than 8" above soil in earth-filled porches and planters (not critical when separated by flashing or poured concrete, or when porches or planters are separate structures.
9. Remove soil under porch slab so that soil is at least 8" below untreated wood framing; or pour concrete to isolate soil from wood in the house. For planters, install continuous flashing or pour concrete to isolate from wood in the house.



10. Untreated wood framing is less than 8" above soil under carport and patio slabs.
10. Install continuous flashing or pour concrete to separate wood framing from soil under the carport or patio slab if there is a possibility of moisture accumulation under the slab.
11. Paint or stucco is blistered, peeling or loose.
11. Try to determine if problem is caused by excessive moisture, poor maintenance, or improper use of materials, e.g., application of oil-based paints on latex, or latex paints on oil sometimes leads to blistering or peeling of the paint. If excessive moisture is the problem, locate the source of moisture and where possible eliminate it. Improve ventilation in crawl space, install vapor barriers in the walls, or vent moist air out of bathrooms, kitchens and utility rooms. Loose stucco should be examined carefully for the presence of subterranean termites.
12. Areas under suspended slab porches above grade are inaccessible for inspection.
12. Provide inspection accesses from either the building side of the porch, or from the outside.
13. There are termite tubes, fungi, droppings, or other wood destroying insects present on the sill boxes, walls, etc.
13. Treat the building sill plates, joists with sodium borate per label directions. Determine if the droppings are insect or rodent and institute proper **IPM** controls.
14. Untreated wood framing in the basement is less than 8" above soil in crawl space areas adjacent to basement rooms.
14. Remove soil in crawl space against basement wall so that the soil is at least 8" below untreated wood framing.
15. There is evidence of decay or insect attack: wood siding, doors, door frames and sills, wooden steps, wood columns, crawl space access doors, fence posts, arches or other non-structural items attached to the house, planters, etc.
15. Determine the source of moisture which allows decay to occur and eliminate it if practicable. Replace structurally weakened wood with sound, sodium borate treated wood where the source of moisture can be eliminated, and seal (with Co-Pel) where it is in ground contact or where moisture cannot be eliminated. Where slight decay has occurred in frames, doors, wood steps, wood

- columns, access doors, etc., brush with a wood preservative/water repellent solution to reduce the rate of decay (do not apply to painted surfaces). Decay is commonly associated with rain splash against wood close to the ground due to an absence of gutters and downspouts, and lack of proper clearance between untreated wood and the ground. Identify the type of insect from the type of damage present, for example termite tubes, insect exit holes, sawdust, pellets, etc., and determine the correct control procedure.
16. There is no access door to the crawl space. 16. Provide an access door to the crawl space. Use preservative-treated wood for framing near grade. Note inaccessible areas under the house in any inspection report.
17. There is not adequate cross ventilation in the crawl space. 17. Install at least four ventilators in the crawl space. Use preservative-treated wood for framing near grade. Note inaccessible areas under the house in any inspection report.
18. Ventilators are closed in the summer. 18. Open ventilators which are closed in the summer.
19. Outside surfaces of foundation walls below grade are not waterproofed (not necessary in arid regions). 19. Waterproof the outside of the foundation walls below grade level if there is any evidence of moisture problems in the basement.
20. There is no drain tile connected to a positive outflow installed around the footings (not necessary in arid regions). 20. Install drain tile and gravel at the footings to discharge water into a storm sewer, street, dry well or other area where it will not run under a building if there is any evidence of moisture problems in the basement.
21. Tree stumps, untreated wood form boards and grade stakes, wood debris, paper products, and plants have been left in the basement crawl space and under suspended slab porches. 21. Remove tree stumps, untreated wood form boards and grade stakes, wood debris, paper products and plants, otherwise they may provide an entry point for fungi and insects. Treat stumps which are difficult to remove with sodium borate where subterranean termites are a hazard.
22. Untreated wood blocks support ducts or pipes on the ground or untreated wood columns, walls and/or stair stringers are in direct contact with the concrete slab. 22. Replace untreated wood blocks with pressure-treated wood blocks or sodium borate treated and sealed (with Co-Pel material).
23. There is evidence of standing water in the crawl space, particularly where the grade inside the crawl space is below the outside grade. 23. Determine the source of the moisture. If it is due to a plumbing leak, repair the leak. If it is a condensate from an air conditioning condensate line, or clothes dryer vent, discharge the condensate outside the crawl space. If it is due to faulty drainage around the house, correct as described before or by trenching around the inside of the foundations walls to run excess water into a storm sewer, street or dry well by gravity drainage or sump pump; or by waterproofing the outside



- foundation walls below grade and installing drain tile and gravel around the footings.
24. There is no soil cover on the soil (not critical in arid regions).
  24. Install a soil cover of 4-mil polyethylene or equivalent material over approximately 70% of the soil in the crawl space.
  25. Clothes dryer vents and air conditioning condensate lines discharge moisture inside the crawl space/basement.
  25. Extend vents and condensate lines to discharge moisture outside the building, not in the crawl space.
  26. There is condensation on beams, joists, sills and subfloor.
  26. Determine the source of moisture. If it is due to poor ventilation, improve the ventilation; if it is due to the absence of a soil cover, install a cover; if it is due to standing water in the crawl space, correct as needed.
  27. There is evidence of water leaks or excessive condensation on the basement walls and floor.
  27. If these are caused by plumbing leaks, repair the leaks. If excessive amounts of water are passing through the foundation walls, waterproof the outside of the foundation walls below grade and install drain tile and gravel at the footings to discharge water into a storm sewer, street, dry well or other area where it will not run under a building; or improve drainage around the building; if there is excessive condensation, determine and eliminate the source of moisture by, for example, installing a vapor barrier on top of the slab if there is not one below the slab; venting moisture from bathrooms, kitchens and utility rooms to the outside; or using dehumidifiers in the summer.
  28. There are plumbing leaks found.
  28. Repair leaks in plumbing and replace caulking and/or grout in showers and around sinks and tubs. One leaky faucet can waste 6,000 gallons of water a year!
  29. The foundations walls are wet.
  29. Control excess moisture by improving drainage around the house or by trenching around the inside of the foundations walls to run excess water into a storm sewer, street or dry well by gravity drainage or sump pump; or by waterproofing the foundations walls below grade and installing drain tile and gravel at the footings to discharge water into a storm sewer, street, dry well or other area where it will not run under a building.
  30. There is evidence of decay in wood foundation walls and/or piers.
  30. Replace all decayed material with pressure treated wood or an sodium borate (Co-pel) treated materials.
  31. For wood beams
    - (a) untreated wood less than 12" above inside grade;
    - (a) Remove soil in the crawl space to provide a minimum clearance of 12" between beams and the soil. If this creates a water drainage problem, correct as previously described.
    - (b) there are mold or stain fungi on the wood
    - (b) Determine the source of moisture and eliminate it if practicable. If it is due to conden-

and/or its moisture content is more than 20%;

plumbing leak, repair the leak. If it is due to water seepage through the foundation, correct as previous described. Replace structurally weakened wood with sound untreated wood where the source of moisture is eliminated. If the source of moisture is not eliminated, then replace all wood with a moisture content greater than 20% with preservative-treated wood, naturally resistant or sodium borate/sealed (with Co-Pel).

**A good inspection should allow you to see the entire forest - not just a few trees.” – SLT**

(c) there is evidence of decay after visual inspection, probing and sounding.

(c) Determine the source of moisture allowing decay to occur and eliminate it as described. If there is extensive decay away from an obvious source of moisture, and no evidence of condensation having occurred on the beams, suspect the water conducting fungi *Poria incrassata* or *Merulius lacryman*. If either of these is present great care must be taken to find and eliminate the source of the fungus.

32. In unfinished basements and accessible areas of finished basements:

(a) there are mold or stain fungi on framing lumber and/or its moisture content is more than 20%

(a) Determine the source of moisture and eliminate it if practicable. If it is due to water leaks through the foundation wall, or condensation, correct as needed. If it is due to a plumbing leak, repair the leak. Replace structurally weakened wood with sound untreated wood where the source of moisture is eliminated. If the source of moisture is not eliminated, then replace all wood with a moisture content greater than 20% with preservative-treated or naturally resistant wood or sodium borate (Co-pel) treated wood.

(b) there is evidence of decay, fungi, insects in framing lumber after visual inspection, probing and sounding.

(b) Determine the source of moisture allowing decay to occur, and correct as needed. If there is extensive decay away from an obvious source of moisture, suspect the water-conducting fungi *Poria incrassata* or *Merulius lacrymans*. If either of these are present, great care must be taken to find and eliminate the source of the fungus

33. In finished basements is there evidence of decay. 33. Control insect attack with sodium borate; treat rodents using true **IPM** techniques.

34. In finished basements there is evidence of insect or rodent attack.
34. Determine the source of moisture allowing decay to occur, and correct as needed. Where decay is in window and door frames check and repair, if necessary, outside caulking or glazing.
35. For sills, headers, joists and subfloor (particularly in poorly ventilated areas, damp crawl spaces and areas where the wood is adjacent to porches, patios and carports)
35. Determine the source of moisture allowing decay to occur, and correct as needed. Where decay is in window and door frames check and repair, if necessary, outside caulking or glazing.
- (a) untreated sills and joists are less than 18" above inside grade
- (a) Remove soil in the crawl space to provide a minimum clearance of 18" between the sills and joists and the soil. If this creates a water draining problem, correct as described previously.
- (b) there are mold and stain fungi on the wood and/or its moisture content is more than 20%
- (b) Correct as described previously.
- (c) There is evidence of decay fungi, insects after visual inspection, probing and sounding.
- (c) Determine the source of moisture allowing decay to occur and eliminate as previously described. If there is extensive decay away from an obvious source of moisture, and no evidence of condensation having occurred on the sills, joists, etc., suspect the water-conducting fungi *Poria incrassata* or *Merulius lacrymans*. If either of these is present, great care must be taken to find and eliminate the source of the fungus. Control insect/fungi/decay attack with sodium borate and/or with dehumidifiers proper ventilation, etc.
36. Note that there is a need to install/repair screens/metal.
36. Do so a.s.a.p.
37. Stored pesticides noted; traps, bait stations and/or trapping devices visible.
37. Determine why and take the proper action.
38. Harborages and/or burrows noted.
38. Correct as needed.
39. Visible entryways/open joints
39. Caulk/seal a.s.a.p.
40. Pest sightings
40. Institute true **IPM** controls.
41. Floor drains uncovered.
41. Cover them.
42. Trees, branches touch or overhang the building.
42. Trim and/or remove.
43. Note and carefully record number and type of plants, problems, buildings and areas in your neighborhood:
43. Correct all problems where possible or call the health department for problems you cannot solve off property.
- (a) residential
- (b) business and residential
- (c) business
- (d) vacant lot
- (e) food business
- (f) vacant (building)
- (g) dwelling units (apts., condo, duplex)
- (h) unapproved refuse, exposed garbage, animal food and other sanitation problems.
- (i) abandoned automobiles and/or furniture, car



- pet, rugs, lumber on ground, other large rubbish
- (j) outbuildings, board fences and walls, weeds and grass
- (k) active rodent signs, potential rat and mice entries
- (l) need to secure lids/covers on trash containers/ use plastic liners, wash, steam clean, or empty more often
- (m) stagnant water, fountains, streams, erosion, irrigation problems, overwatering, plumbing leaks, etc.
- (n) dumpsters - need repair, empty, clean
- (o) loading docks - need to clean, close doors, repair, caulk, seal
- (p) outside eating areas - trash noted
- (q) wildlife, birds noted and reasons for presence
- (r) openings noted into the building - pipes, vents, lines, etc.
- (s) plants - locations, health, soil cover, flowering and/or fruiting types, irrigated?
- (t) type of lighting/mercury vapor/sodium/too close/etc.
- (u) air conditioning problems
- (v) list other visual repairs needed or problems noted.



## INSPECTION VS. MONITORING

**The purpose of a visual inspection is to look for: (1) conditions conducive to infestation such as moisture, temperature, food, shelter, access, and suitable environments that favor pests; (2) signs of pest damage, entry, or presence (such as tracks, insect parts, webs, trails, rub marks, tubes, gnawings, droppings, nests, and cast skins); and (3) the pest itself.**

**Note: A proper and thorough inspection** involves careful and thorough searching in and around the **entire** structure for signs of the pest and conditions that encourage its entrance and/or buildup. Monitoring is a systematic record keeping of inspections noting observed problem areas, pests, or pest signs over a period of time. Monitoring will help detect access points, infested areas, reinfestations and is the only real basis for evaluating or initiating any control program(s).

When you make your initial inspection and at least monthly monitoring inspections, ask everyone you see for their observations - then carefully record everything you see or hear and note all of these locations on a sketch/graph of your building and surrounding areas. Include the exact locations of all heating or air conditioning ducts and vents, plumbing, attics, basements and crawl way vents and access points, wall voids, sub-cabinet voids, broken windows, visible openings, and other features of the building which allow pests to get in or which provide food, moisture or shelter for them. Also, note all structural and construction problems, bad sanitation practices, spills, debris, messes, etc. that may cause potential problems. Be sure to note any inaccessible areas, areas of poor or faulty construction or places where the building has been damaged by the careless operation of equipment, leaking plumbing, the date, time, relative humidity, wind, and temperature data, etc. Show the locations of trees, firewood, new construction, shrubs, trash, abandoned vehicles, furniture, garbage storage, water sources, changes in grade, and other features of the surrounding areas that may attract or harbor pests or promote pest buildup in your building or yard, your dated records should carefully record all casual/visual observations and locations, your own written observations, all qualitative and quantitative descriptions, controls and sampling results. **Unfortunately, inspections and monitoring may be complicated by the fact that pests and people don't always keep the same hours, nor do they use the same areas we live in.** In fact, the survival of a pest species in close proximity to humans is at least partially dependent on the fact that our daily schedules and areas are not the same. For this reason, **a flashlight with a red filter, a magnifying glass**

**and bendable knees are often the most valuable monitoring and inspection tools you can have.** Don't forget to bring along your notebook and pencil for keeping records, and a plastic bag or small jar for holding specimens you want to examine more closely later. A floor plan of the facility is very helpful, especially when designing a true **IPM** program. Maps and building floor plans will show you hidden areas that you may not have known about. Each room should be shown on the floor plan, with trap locations and pests noted. Using colored pencils to make such notes is helpful. The diagram will let you know if traps/pests have been moved/controlled.

Always be aware of improvements in the field of pest control and inspections, e.g., Issue 45, Spring 2007 of the Communicator, the Voice of our Nation's Appraisers and Home Inspectors, had an interesting article starting on page 21, entitled "The Bug Whisperers: HomeSafe Inspectors Talk to Termites."

**HomeSafe's cutting-edge termite detection technology** was initially developed by HomeSafe co-owner Peng Lee as part of a USDA-funded project at the University of Mississippi's National Center for Physical Acoustics (NCPA) - <http://www.olemiss.edu/depts/ncpa/>. In the 1990s, Lee, then a NCPA research scientist, developed a powerful listening (acoustic) device (patent pending) to detect the unique sounds made by certain crop pests, such as the Caribbean fruit fly and the pink boll worm. Appointed to serve on the USDA's Project Full Stop, a nationwide campaign to reduce America's population of Formosan Termites, Lee modified his invention to detect termite sounds. Lee later combined the acoustic technology with specially customized infrared technology, enabling inspectors to 1) detect the telltale moisture of a termite colony behind walls with infrared and; 2) to confirm the termite infestation by acoustic detection and specialized pattern recognition software that recognizes only termite sounds.

HomeSafe Inspection, Inc. has since refined and customized these technologies specifically for the termite inspection industry. The technologies empower HomeSafe inspectors to perform advanced, state-of-the-art termite inspections that go far beyond the traditional inspection offered by other companies. Here's how the process works:

### **Step 1: Infrared Scanning**

Most termites bring in their own water supply to a house. HomeSafe's customized infrared camera detects very tiny differences in temperature from one area of a house to another, thus zeroing in on "cold spots" associated with moisture in a termite colony. Areas with suspicious "cold spots" are tagged during the infrared scan for further investigation utilizing the acoustic sensors.

### **Step 2: Acoustic Detection**

Once "cold spots" are detected, the HomeSafe acoustic (listening) sensor (patent pending) can be employed in the tagged areas. Inserted into the wall or floorboard, the needle-like sensor's microphone detects termite noises that the human ear can't hear - i.e., chewing sounds or warning alerts issued by soldier termites.

### **Step 3: Pattern Recognition Confirmation**

The audio signals detected by HomeSafe's sensors are instantly fed into a Tablet PC outfitted with HomeSafe's specialized pattern recognition software (patent pending). This software swiftly analyzes the signals and determines, on the spot, whether or not they are termite sounds. The HomeSafe Termite Detection Process:

- Confirms termite infestations on the spot
- Pinpoints termites' exact location for better treatment
- Is significantly more effective than traditional techniques
- Is completely non-destructive
- Is fast and efficient
- Eliminates guesswork and minimizes risk of human error
- Utilizes a centralized database to confirm insect sounds swiftly and objectively

[http://www.homesafeinspection.com/index.php?option=com\\_content&task=view&id=368&Itemid=131](http://www.homesafeinspection.com/index.php?option=com_content&task=view&id=368&Itemid=131)

**Summary - Your inspection should be a thorough investigation where your observations, examinations and systemic inquiries give you all of the data necessary about each situation, contributory conditions, pest stage(s) and locations(s) to make a proper diagnosis of the infestation and its safe control. Remember what Sherlock Holmes told his friend, Dr. Watson: “Watson, you look, but you do not see.”**



**“Truth is confirmed by inspection and delay; falsehood by haste and uncertainty.” — Tacitus**

**“Nature will bear the closest inspection. she invites us to lay our eye level with her smallest leaf, and take an insect view of its plain.” — Henry David Thoreau**