FACT*Sheets*

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The FACT*Sheets* publication is an integral part of the home inspection report. The topics are various home inspection related items with detailed descriptions and explanations of each. Read and reference those that apply to your house to help you to better understand them.

Contents

Air Conditioner Not Checked

If the day of your inspection is under 60 degrees F., we cannot operate the air conditioner. To do so can *seriously damage* the equipment. Hence, during many fall, winter or spring inspections, the condition of the central air conditioner (or any wall or window units) will remain unknown.

If the inspection is in late winter or in spring, you may be able to test the air conditioning equipment by the time of your final walk-through. Most inspections take place two months or so before final walk-through, and by that time the weather may be warm enough to safely operate the equipment. *Do not operate any air conditioning equipment if the outside temperature is below 60 degrees!*

You can probably make an adequate test of the air conditioner simply by turning it on and, after 10 minutes or so, 1) checking outside that it is running , and 2) that cold air is being delivered at the registers in the house. If you want to be more technical, bring a thermometer to your final walk-through and check the air conditioner the way an inspector does:

Turn the equipment on. After 10 minutes, measure the average temperature in the house, say at waist height in the middle of a large room. Now measure the temperature of the air coming out of a register. The air at the register should be 13-22 degrees (F.) colder than the room temperature. (Settle for a 10 degree drop if the house has been closed up and is very humid inside.) Temperatures outside these ranges indicate trouble and the unit should be professionally checked.

An alternative is to arrange to have a heating and cooling contractor meet you at the house at the time of your final walk-through. Order a normal *spring checkup and service* be performed. This will get this annual chore out of the way for the year, and you can be professionally assured that the equipment is *in working order*. The disadvantage here is one of time constraint-walk-through and settlement are often hectic times and these kinds of arrangements may prove too trouble-some to accomplish. Also, in the rare instance that settlement does not take place, you will have paid a contractor to service equipment that you do not own!

Your inspector can return to the property to test the air conditioner for an additional fee. Or your inspector can return to perform your entire walk-through with you. Testing the air conditioner, of course, would be included. We offer a reduced price for this service to our clients who have purchased our Basic Home Inspection.

If the weather surrounding both your inspection and your walk-through makes testing the air conditioner impossible, talk to your real estate agent about alternatives. If your purchase contract guarantees the system will be in working order, but you cannot test it, your agent or settlement attorney may be able to arrange some kind of extension of that guarantee until warm weather arrives.

Amateur Work

Many home inspection reports state that a particular feature of the house appears *amateur* built, or displays *amateurish workmanship*, or *nonstandard construction*. Is amateur work a problem?

We think that the answer depends on whether the work was inept enough to create functional problems. Home inspectors at times see cases of unbelievably bad amateur workmanship– house features that have actually been compromised structurally, or rendered downright unsafe by poor construction. To save money, many amateurs have evaded getting legally-required building permits, and thus have avoided city or county inspection of their work in progress.

Most home inspections will detect any amateur work in a house, and a good inspector will scrutinize it closely. The inspector will see if an obvious problem has been created, but looking at a completed project of any kind leaves unknowns. Inspectors cannot inspect concealed structural work, electric wiring and plumbing pipes once the walls are finished.

Professional workmanship, of course, does not guarantee quality. But when the visible parts of new work appear professionally done, to the same standards that such jobs are usually done, we inspectors have some confidence that the concealed work was done in a standard way as well. We conclude that it *probably* will behave over the years like similar installations. We have less confidence when confronting the visible evidence of an amateur-done project.

In summary, don't rule out a house that has been improved by *loving hands*, but do factor in the possibility that some components might not prove as durable, useful, safe or trouble free as if they were done in a more standard way.

354-4554
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Building Codes

Rare indeed is the home where everything is *up to code*. Building codes are rules governing new construction. They are based on national models and are adapted locally by the city or county, which then has the legal power to enforce them. Code rules change periodically to reflect new materials and new concerns with safety and utility. All new work must follow their dictates.

Building codes do not apply to *existing* houses. Unless a violation is cited while it is occurring, during construction, the rule goes unenforced. Like speeding on the Beltway, once you are off the highway and a few blocks away, you are not going to get a ticket.

We home inspectors have no power granted by local governments to enforce the code. And since most of our work concerns existing houses, codes are not applicable to the home inspection process. In fact, if we judged every existing house by today's codes, we would have many needlessly confused and unhappy clients.

Sometimes we look to code standards as a set of common sense guidelines to judge the adequacy or quality of existing work. But even here we must use discretion. Do we use the rules that were in effect when the house was built? Or do we use today's rules? Or some version in between? Also, in some cases the local code enforcement officer may have approved a variation on the rules as the house was being built. If such a variation was approved, it by definition *meets the code*, even if it differs from what the code book said.

Sometimes our clients, after occupying a home, are told by a plumber, electrician, or other contractor that one feature or another is not *up to code.* Be careful if you hear this. Often it is a sales ploy by an individual who wants to sell work, or expand a simple repair job into a major improvement. If that contractor can demonstrate to you that a house feature is not doing its job, or has become inadequate or unsafe, that is a different story. Hear the person out. If necessary, call your inspector for a second opinion. But if the contractor tells you something **must** be done to *meet code*, be wary. He or she may be urging you to upgrade a 1952 Ford to 1996 Cadillac standards.

While no building authority will force you to upgrade your existing house, any improvements you do make will have to meet current codes. But remember, the rules only apply to the new work. Old features are not affected unless they are an integral part of the job. When you do have major work done, the city or county inspector can be your best friend—your job will be inspected for free, and by an individual with the legal power to ensure that it is done right. Beware of contractors who offer to make major improvements without getting necessary permits, thus short-circuiting the official inspection process. The small savings in money and time are seldom worth the risk to you. If you have any doubt as to whether a particular job requires a permit, or exactly where the boundary lies between new work and old, call your local building department for the definitive word.

Ceramic Tile Shower Pan Leaks

Stall showers with tile floors are very long lasting, but over time they are likely to develop leaks. This is usually due not to a tile problem, but to the pan installed beneath the tile to make the shower waterproof.

In old homes, the tile shower floors were waterproofed by lead pans, or receptors, underneath the tile. To make a lead pan, a plumber or tilesetter would bend the material to form a tray, with sides about four inches high. A hole was cut into the middle to accommodate the drain fitting. A mortar bed was laid over the pan, and then tile was embedded.

Lead pans last about 25-50 years, occasionally longer. Eventually, however, the metal corrodes and the resulting holes allow water to leak into the ceiling below. During your home inspection, your inspector floods the shower floor with water for 10-20 minutes, then checks for leaks below. If any are found, further investigation should be done by a plumbing contractor. Sometimes the contractor will have to cut away the ceiling below to view the underside of the shower floor and make a final diagnosis of the problem. This is not something home inspectors are permitted to do.

Although leakage usually indicates a bad pan, leaks can occur for less serious reasons too–a bad drain connection or spillage onto a poorly grouted floor outside the shower are two other possible causes. If the pan is at fault, the repair is expensive because the whole shower floor and about six inches of wall tile are involved. Prices typically run between $1,000-$2,000. Drain repairs or less serious tile repairs are much less, of course. A repair contractor can quote exact prices after diagnosing the problem.

In the 1970s, neoprene (a thick, tough, synthetic rubber) replaced lead as the material of choice for new shower pans. The life expectancy of neoprene pans is still an unknown, as none has failed from old age yet. Other choices for replacement floors are pre-fab shower bases made of fiberglass, synthetic marble, cultured marble, or tough polyester resin. These floors are typically not tiled over and are not subject to wearing out like an old, lead-lined shower floor. One of them may be a better choice for you when replacing an old, tile shower floor.

Ceramic Tile Floor Problems

Ceramic tile is durable, elegant, maintenance-free and, when installed correctly, it is permanent. Ceramic tile walls and floors, still in serviceable condition, have been found in Roman baths two thousand years old. In fact, when ceramic tile causes problems, it is likely that the substrate–what is under the tile–rather than the tile itself, is at the root of the problem.

Ceramic tile is often retrofitted into newer homes to add elegance or ease of maintenance to expansive front hall or kitchen floors. This may yield a bad result because the substrate is not adequate for the installation. Newer homes are often built with lightweight joists, or floor trusses, and thin plywood subfloors. This saves costs, and fewer large, old-growth trees are

used up. But while these lighter floors may be perfectly strong enough to support the weight of a new tile floor, they are seldom stiff enough for use under tile; they were designed with flexible, resilient flooring in mind. Tile is a completely rigid material, as is the grout that fills the joints between tiles. Any bending of the floor will crack tiles or pop out the grout.

When a tile floor is installed over lightweight subflooring, the floor fails. At a minimum, the floor needs repeated tile repairs and regrouting. In bad cases, owners tire of this and come to consider their floor a total loss. They tear up the tiles and go back to wood, sheet vinyl, carpet or some other material that will tolerate flex.

If you are determined to keep the tile on such a floor, then the floor structure itself must be stiffened. Some contractors contend that thick plywood or cement board laid under the tile will do the job. We are skeptical, and believe that the job is best done by structural reinforcement of the beams and joists under the floor-an expensive proposition. If the room below has a finished ceiling, it must be demolished to gain access to the beams and joists, then replaced when the job is done-adding yet more cost.

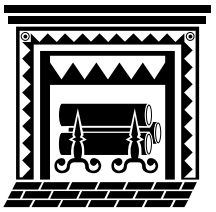
If your inspector sees cracked tiles or popping grout, be warned that the repair is not one of simply replacing a few tiles or regrouting the joints. Even in the absence of damage, you may still be advised that your floor is suspect. A new ceramic tile floor, or one that has been recently repaired, may not show signs of failure until you have occupied the house and used the floor. Keep this possibility in mind when proceeding with your purchase-floor replacement may be needed down the line. Unfortunately, only time will tell.

Heat Pumps

Heat pumps do not operate like other heating systems. In winter, in the heating mode, the heat pump captures heat from outside air and transfers (*pumps*) it inside to warm the house. In summer, in the cooling mode, the process is reversed. The heat pump removes heat from inside the house and transfers it outside for discharge. The heating or cooling mode is controlled automatically by the indoor thermostat setting.

Your heat pump will deliver air to your rooms at lower heat levels than fossil fuel systems. Air at the supply registers usually ranges from 85 to 95 degrees, although some newer heat pumps deliver somewhat warmer air. Delivering air at these temperatures allows your equipment to operate economically, but air at these temperatures will feel cool blowing directly on your skin. Yes, the equipment will heat the house…but it may cool you in the process. For comfort, wear collared shirts and long sleeved garments in your home in winter to keep the draft off of your skin. Try to place furniture away from heat registers, and get plastic deflector shields to redirect the air from any register that blows directly onto a bed, chair or other seating area.

As outdoor temperatures get colder, a heat pump must run longer and longer to capture enough heat for the home. At about 25 degrees or so, the heat pump will no longer be able to supply enough heat and the supplemental heat-generally electrical resistance coils-will automatically come on as needed. While this electric resistance heat is more costly than heat pump heat, in cold weather its use is unavoidable. Even so, over an entire winter, it still accounts for only a small percentage of your costs.



You can avoid unnecessarily triggering your more expensive supplemental heat by leaving your thermostat alone. Pick a comfortable temperature and stick with it. Do not try to save money, as with other kinds of heat, by turning the heat down at night or when you go to work. When you turn it back up again the sudden demand will trigger the resistance heat and more than wipe out any savings you realized during the setback period. (Some programmable thermostats designed specially for heat pumps can manage setback periods without this bounce-back effect.)

When outdoor temperatures fall very low-say under 17 degrees-your heat pump must work so hard and long that the cost of the heat rivals the resistance heat. During these frigid times, you may want to turn the switch on your thermostat to the *emergency* heat, or *supplemental* heat, setting. This will turn the heat pump off and all of your heat will be supplied by the resistance elements, and the air coming out of your registers will feel warmer. You will gain in comfort, and you won't be spending any more money. Be sure to return the switch to the normal heat mode when the frigid weather gives way to normal winter temperatures to again take advantage of the normally cheaper heat pump heat.

It is very important that good air flow be maintained through a heat pump system. Change or clean your dust filters every month. Do not close more than two or three registers in a house at any one time and never block the large, central return air grilles. Additionally, have your system professionally cleaned and serviced at least every two years.

Ice Maker/Refrigerator Off

Ice makers and refrigerators must run for several hours for your inspector to make a positive determination that they are working properly. It takes that long for the ice maker to deliver two or more batches or ice, and prove that all parts of its cycle are engaging properly—fill, chill, dispense, refill, and shut off when the bin is full. Refrigerators take considerable time to prove that they can reach the desired temperature and maintain that temperature. If either appliance is unplugged or turned off when the inspector arrives, it will not be possible during the time normally available for the inspection to positively make these determinations.

If a refrigerator or ice maker is off when the inspector attempts to inspect it, he or she will turn it on and see if it runs. That may give an indication that

the appliance is not totally out of order, but it will not allow us to conclude that it is working properly in all regards.

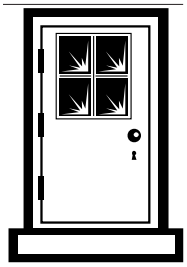
We suggest that if we cannot fully inspect a refrigerator or ice maker, that you notify you real estate agent of that fact and arrange to have the appliance turned on a day or two (minimum) prior to your final walk-through of the property. Then, at that time, you will be able to verify that the appliance if working. Check that the refrigerator compartment is in the 32-40 degree (F.) range and that the freezer holds -5 to +10 degrees or so. Slightly warmer temperatures are acceptable if the temperature control is set near the *warm* end of its range.

Ice makers should be checked to see that fresh ice has been delivered. The ice should not be frost covered or the cubes stuck together (the latter may indicate that the tray is overfilling and water is splashing down into the bin). After you move in, throw away that first batch of ice and allow the machine to make a fresh batch before you use it.

Metal Roofs

People often refer to any metal roof as a *tin roof*, but in fact most metal roofs are actually steel, not tin. In the past, metal roofs were coated with *terne*, an old-time mixture of tin and lead, to resist rust. Maybe terne and tin sound enough alike to account for the confusion. New steel roofs are zinc covered.

In time the terne or zinc wears off, exposing the steel to rust. Once a metal roof is 20 years old or more, it must be recoated every 5 years or so. In the old days, tar was the choice. In those days, *tar* meant coal tar, which got soft every summer and oozed together any cracks that had formed in the cold weather. Unfortunately, as the use of coal in American industry has waned, coal tar has become rare. Now what people call *tar* is asphalt—a petroleum by-product. It does not soften and self-heal in the summer and in fact is a very poor choice as a roof coating for many reasons. Now the coating of choice is fibrous aluminum paint. It is silver and thus reflects sun rays, lowering summer cooling costs.



Metal roofs should be recoated any time the surface begins to show flakes, cracks or rust. The roof should be scraped of any loose tar or paint first. Don't be too aggressive in scraping—the metal is thin and can be pierced by the corner of your shovel or scraper. Just scrape off whatever is already loose. Then wash the roof, then paint it. The paint will stick to any tightly adhered old coating. A few years later, do it again. In this way, many roofs previously coated with tar can be rehabilitated. After 2 to 4 scrapings and paintings, the roof will be free of tar.

Unfortunately, home inspectors cannot see underneath layers of old tar. If a roof is coated at the time of inspection, we cannot judge the roof's condition. Its condition must be considered unknown, and there is the risk that the building will require re-roofing soon. There are two reasons a roof might be thickly coated—one good, one bad: the owner might have maintained it very well, adding layer after layer of coating during periodic maintenance; or the roof might have holes in it and the owner coated the roof heavily to stop the holes from leaking and extend its life. Only time will tell the true condition of the roof.

In our experience, most coated metal roofs are usable. Often they can be restored via the method discussed above. If, when scraping the roof, you find many rusted-through holes, you should begin to think about reroofing, though not necessarily right away. You can use such a roof for another year or two just by recoating it.

When reroofing a building with a low slope (nearly flat or flat) roof, we recommend one of two types of new membrane roofing systems: EPDM rubber, or Modified Bitumen. Both are moderately priced and can last upwards of 30 years.

Not Inspected

Some items in a home are not normally checked by your inspector due to limits on time, moving furniture, dismantling equipment, causing harm to the house, or inaccessibility without special equipment. They are excluded from the scope of the inspection. In most cases these do not prove a cause of concern. In some cases, however, they do.

For example, the condition of wood floors under heavy rugs cannot be determined. In most cases, they are in the same condition more or less as the visible parts of the floor…but sometimes they are not. We know of one case (out of thousands of inspections) where the owner of the house deliberately concealed serious pet stains. Unfortunately there is no way to discover this type of problem on a basic home inspection.

We believe our inspectors can tell you more about a house than any single source. But we cannot tell you everything. We cannot eliminate all of the risk of home buying.

Other examples of areas that cannot be inspected include the interiors of most chimney flues, the attachments of ceiling fans and sun decks to the house structure, and the condition of roof sheathing under the shingles.

Sometimes you can ask an owner to make a positive statement about anything that might be known about concealed conditions. This could reveal a problem, or could turn up the history of a condition that later will help you understand and deal with it better. If you are lied to, you might have legal recourse (consult an attorney).

For some other of these uninspectable items, it is possible to have a specialist probe further. An electrician can dismantle a ceiling fan and examine the quality of the hanger. A carpenter (with the current owner's permission!) could tear out part of a ceiling to examine the interior end of deck attachments. Some chimney sweep services have special video cameras and lights that can be lowered down a

chimney to inspect every square inch of the flue interior. We believe that unless there is some obvious sign of trouble, these procedures are not cost effective.

If, upon occupying the property, signs of trouble appear– the ceiling fan that seems to hang lower from the ceiling than it did in the past, a growing gap between the deck and the house wall, and so forth– you should take them seriously. Call in the electrician or the carpenter for further evaluation. Remember, too, that your inspector is available to you for a year at no charge by phone to help you decide on the proper course of action; by calling us first, you might save money on unneeded repairs or inappropriate specialists.

Polybutylene Pipes

A new kind of plumbing pipe was introduced during the late 1970s made from polybutylene (POLY), an inexpensive, versatile plastic. Contractors loved it because it was flexible. Unlike copper or steel pipes, it did not need an elbow every time it changed direction. Plumbers could just bend it around corners and snake it through walls. The labor savings were enormous.

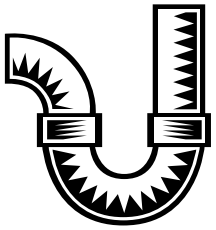
Unfortunately, problems developed in some of the six million or so systems installed. Pipes came apart at fittings, or the fittings themselves deteriorated and broke. Repairs were not complicated, unless the failure occurred in concealed space behind a wall. But the damage caused by the leaks—floods, in some cases—was serious.

Several solutions were tried to address the problem, but apparently none proved entirely successful. Contractors have given up on POLY, and recently the last manufacturer of the material left the business.

Where installed, the material was approved for use by building codes. It is legal. While the material undeniably presents more risk than copper, steel or CPVC piping, the extent of the risk remains debatable. We have seen few actual problems, and plumbers point out that most failures are leaks at fittings near the water heater, thus usually easy to access and repair. But when failures occur, they can be serious. There is also some risk that existing installations will deteriorate over time. Some owners opt to replace their entire system rather than deal with leaks on an as-needed basis.

The cost to replace all of the pipes in a house typically runs between $1,500 and $5,000. Many installations are covered by a resolution program set up by three of the former makers of POLY: Shell Oil, Celanese and DuPont. (Plumbing Claims Group, Inc. 1-800-356-3496.) This program will pay to fix a leak in any *covered* system. If a second leak occurs in the same house, the program will arrange to re-plumb the whole house at no cost to the homeowner. (Check eligibility rules!) Alternatively, the work might be covered by a builder warranty if the house is fairly new. Homeowners insurance generally covers water damage to a house and belongings, but it will not pay for repairs to the piping itself in most cases. Check your individual policy.

For further information, we suggest you call the local building department, the local water department, or the Plumbing Claims Group. Also, ask neighbors, or any condo or neighborhood association, if there have been any documented problems in your development or building.



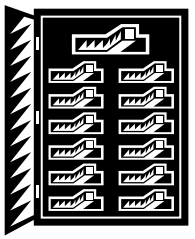
Slate Roofs

A slate roof in good condition is a positive value on a house. Slates are far more long lasting than asphalt shingles or wood shakes. Slate roofs require periodic maintenance to seal metal flashings and replace any slates that crack or come loose from the roof.

Occasionally you will notice slates lying in the bushes near the home, or caught in a gutter. It is not necessary to call in the slater every time you notice a dislodged slate. Slates overlap each other, so a single missing unit will not necessarily cause a leak. However, a missing slate weakens the resistance in the area to wind driven-rain, so a leak can result from storms associated with high wind conditions.

Generally every five years or so, or if you notice that several (a half dozen or so) slates have dislodged or broken, it is time to call in the slater. Choose a contractor who has experience with *slate* roofs. Not all roofing contractors are skilled at working on slate roofs.

Some people are under the mistaken impression that slate roofs last forever. This might not be much of an exaggeration in the case of a well installed roof of New England slates. Many roofs in our area, however, consist of slate that comes from the area of Pennsylvania surrounding the town of Bangor. The useful life of this material ranges from about 40-50 years on a sunny (south facing) roof surface to 60-80 years on a shaded roof surface.



Over the years, Bangor slate absorbs water by capillary action at its edges. The water dries through the surface, leaving behind dissolved minerals. Look for white rings near the border of each slate. This is the first stage of deterioration and indicates a roof is aging. As the deterioration progresses, layers of slate begin to scale off. The slates begin to look flaky and turn brown or black. Now the slates are soft and will dislodge and break more easily.

If a few slates in the roof have reached the dark, flaky stage it is time to begin thinking about reroofing the house. However, such roofs can often be nursed along for a few or several more years with increased care. As time goes on, more and more slates will need periodic replacement, and more often will you find dislodged slates in garden and gutter.

Once many slates have reached the darkened, flaky stage it is time to reroof the house. Too you will face ever-increasing expenses for replacing slates, and eventually the roof will be so brittle that the roofer will not be able to work without causing further damage.

When reroofing, you will have to choose whether to use slate for the new roof, which is very expensive, or switching to asphalt shingles at about one-fourth the cost. Consider how visible the roof is from the ground in making the decision. Remember, the whole roof does

354-4554
Rusty Layton

not have to be done if only one slope is worn out. And, there is no reason you can't have asphalt shingles on the rear, slates on the front, if that is the best solution.

Steel Plumbing

Many houses built before 1955 have steel plumbing pipes. Unlike copper pipes, steel pipes have a limited life span. Usually steel pipes must be replaced when they are between 50 and 70 years old. This is an expensive proposition.

The first signs that steel pipes are deteriorating are small, visible spots of rust. These form where the pipe rusts through, seeps water, then *self-heals* the leak with an accumulation of more rust. When an inspector sees many *self-healed* leaks, the inspection report will state that the plumbing is nearing the end of its life.

While this process goes on, the pipes are also rusting internally. The rust soon begins to clog the pipes, reducing the amount of water flow. Users of the system experience a loss of pressure and wide temperature swings when additional fixtures are turned on or off. Most familiar is the shower that runs suddenly colder when a downstairs toilet is flushed. People may live with this condition for many years. But the rusting never stops. Over time, the problem just gets worse and worse.

To test pressure and flow, your inspector operates several fixtures at once and observes the results as each additional fixture is turned on. If you are buying a house, however, you must be the final judge of what you will accept. There are few objective standards applicable to old construction. One is the definition of *functional flow* provided by the American Society of Home Inspectors®: *A reasonable flow at the highest fixture in a dwelling when another fixture is operated simultaneously.*

While most people will choose to replace steel pipes long before they fail that test, it is possible to extend the life of an aging steel plumbing system by budgeting water usage and having consideration for others in the house. (*Don't start the dishwasher, dear, I'm getting into the shower!*) Some people consider this a normal part of living in an old house.

Eventually, however, the pipes will need replacement. The usual cost for this is $1,500-$4,000. It sometimes can be done in stages. First the easily accessible horizontal pipes in an unfinished basement are done. This, costwise, is about one third of the job, and it may bring several years of relief. Eventually the walls must be cut into and the vertical riser pipes replaced.

In some houses, the homeowner will face an additional bill of $1,000-$3,000 to dig up and replace the main pipe entering from the street. But this main is larger and in most cases lasts 10 to 20 years longer than the internal pipes.

Wet Basements

Your home inspection will report on any observed signs of past dampness, seepage or flooding in the basement. Remember, however, that it is not always possible to detect signs of past water infiltration, and that no inspection can assure against future water infiltration.

In fact, the majority of all basements in our area are too damp, and some actually flood during and after heavy rain. Such conditions are seldom difficult or expensive to cure. The key is to reduce the saturation of soil surrounding the foundation during periods of wet weather.

Leakage into basements seldom causes structural problems. However, the condition should be cured whenever possible to increase the utility and comfort of the basement. It is not necessary to spend thousands of dollars to cure these problems–despite the advice of so-called *waterproofers*. According to the Washington Suburban Sanitary Commission, which has studied wet basements, and our experience, *98 percent of all leaky basements can be cured by correcting outside drainage conditions surrounding the house foundation.* Simply improving drainage will reduce dampness in all basements and prevent any seepage in most basements.

Most important is the condition of the house gutters. Gutters catch rain draining from large expanses of roof and channel it through downspouts to the ground. If gutters overflow, the water ends up *exactly where it will do the most harm—at the foundation.* Gutters must be kept in good condition. Frequently examine them to make sure they are well attached to the house, pitched to drain toward the downspouts, and clean. Cleaning may be needed several times a year. Gutter screens can cut down on the frequency of cleaning, but will increase the work involved in each cleaning. Additionally, downspouts must be directed to discharge water well away from the foundation. Concrete or fiberglass *splash blocks* are sometimes adequate; we prefer that each downspout be fitted with a plastic extension tube to carry drainage four to eight feet, or more, away from the house. Such tubes are sold at local home center stores and often cost less than $5.

In addition, all soil adjacent to the foundation should slope evenly and smoothly away from the house for a distance of three to six feet. If necessary, add soil to improve the grading. If you have a strong back and a wheelbarrow, you may be able to do this yourself. Or consult a landscaping contractor. Use clean fill soil, high in clay content. Topsoil, mulch, grass or ground cover can be added on top of the fill to create the desired visual effect and protect the clay from eroding.

Hard surfaces (driveways, patios, sidewalks) adjacent to the house should slope away from the foundation, and their joint at the foundation should be kept well sealed with good caulk.

If you need further information about wet basement conditions, please call before contracting for any drain system, sump pumps, foundation coating or sealing, or any other expensive wet basement "cures." We can direct you to the proper information. In most cases, we can help you avoid thousands of dollars of unnecessary expense. But only if you call us first!

Wet Crawlspaces

A wet crawlspace, unlike a wet basement, is seldom perceived by a homeowner as an immediate and major problem. Out of sight, out of mind, a wet crawlspace may go for years without affecting the use and enjoyment of the home.

As building inspectors, we see the trouble this inattention can lead to: rot, mildew, brown fungus, ruined insulation, and odors. These conditions can be expensive and extensive to correct. Ignored long enough, they can lead to serious structural harm.

Inspection of the crawlspace entails probing for wood for rot, looking for unsound structural members, and testing the joists and subfloor with a moisture meter. We are particularly interested to find any wood with a moisture reading over 18%. Wood drier than that level will not support the life of microorganisms and fungus that cause rot. Wetter wood is vulnerable.

Even if we do not find any rot, or other conditions requiring correction now, we *strongly* urge that any crawlspace containing wet wood, excessive general dampness, or evidence of past water penetration be dried out to help forestall problems in the future. (Note: Wet crawlspaces also are much more vulnerable to termite infestation than dry ones. Termite inspection is not part of your home inspection. Your home should be separately checked for termites and wood boring insects by an exterminator.) Then your crawlspace should be reinspected *at least* every two years by a termite inspector or your home inspector.

To dry out a crawlspace, first take all of the steps we advise for wet basements. These alone will dry out many crawlspaces. Additionally, we recommend adding a plastic sheet, called a vapor barrier, over the floor of the crawlspace to keep out rising soil moisture.

All crawlspaces should either be vented—so outside air can circulate and dry out the area—or fully enclosed, insulated, and heated and cooled as part of the home. Your inspector will suggest which is right for your particular crawlspace. A few wet crawlspaces may also require a sump pump or a dehumidifier.

During a home inspection, we get into any crawlspace that we can. If there is no access to the space, if the space is too small to fit into, or if flooding, exposed electric wiring, broken glass or other hazardous conditions exist, we may have to exclude part or all of the space from inspection and conditions may remain unknown. In these cases we urge you to have the impediments to access corrected, and a thorough inspection of the crawlspace made, as soon as possible.

FRT Plywood

Many homebuyers are concerned about premature deterioration of roofs in townhouses and condominiums because of fire-retardant treated (FRT) plywood. Intended as a safety measure, FRT plywood is supposed to stop the spread of fire from house to house via connected roofs. It has been required by building codes for attached dwellings since the late 1970s.

Apparently normal heat buildup on some roofs can set off the fire-stopping chemical reaction that the wood's inventors intended to happen only in the heat of an actual house fire. When the reaction occurs, the chemicals attack the structure of the wood, causing it to weaken. Seriously weakened material can let go of the shingle nails, allowing the shingles to blow off, or can sag or collapse. Roof leaks will result from any of these failures.

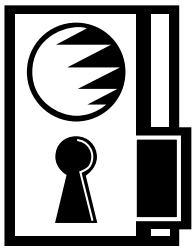
Not all FRT plywood fails. Houses built since 1989 use an improved type that apparently does not deteriorate at all. In older homes, about 50% of it seems to be holding up just fine. About 30% is failing slowly and will need replacement when the house is 15-20 years old and undergoes its first normally expected re-roofing. The remaining 20% of the material failed fast and needs to be replaced immediately, if it has not already been.

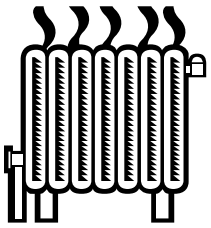
During your home inspection, your inspector looks carefully in the attic for any sign of plywood deterioration. Early signs of change include darkening of the wood or the formation of a fine white powder on the surface. Signs of advanced deterioration include blistering, alligatoring or softening of the surface. A *pressure test* may be performed—your inspector pushes up hard against the underside of the roof; a crunching or crackling sound is a sure sign of imminent failure. Outside the house, we look for any sagging or buckling of the roof, or the lifting or blow-off of shingles.

If the plywood is in just the initial stages of deterioration, it might well survive as long as the roofing. If so, it is most economical to wait until the house needs a new roof anyway before replacing the plywood. If the material is in seriously deteriorated condition, we will advise immediate replacement. In ambiguous cases, a delay in repair for a few years is probably feasible, but the plywood should be periodically reinspected—say every 3-5 years.

There is no way to replace failed plywood without reroofing the house. Typical reroofing of a townhouse costs about $1,000-$2,000. Replacing the plywood adds about $400-$700.

In any case, you should not walk on an FRT roof or allow any service contractors to do so unless they are skilled professionals. While weakened plywood may stand up just fine to snow and wind loads, the concentrated weight of a human being can cause failure. Serious falls and injuries can result. Professionals know where they can and cannot put their weight when atop the roof and can thus avoid injury.





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Budgeting Future Replacements

Your report includes your inspector's estimates of the age of some major components and their remaining useful lives. No one can predict when any item, however new or old, will need repairs; the estimates we furnish are for how long the component might be expected to last before total wear-out and need for complete replacement. These estimates are based on statistical comparisons and broad averages. The way a component has been maintained in the past (or not maintained), past use, its initial quality, hidden manufacture defects, and just plain good or bad luck can all drastically affect the actual useful life. These are beyond our ability to take into account. Replacement costs are based on standard quality. Super-economy, or luxury-grade replacements would considerably expand the ranges given.

Repair Cost Estimates

If your report includes estimates for repairing any problems, please remember that they are just that-*estimates.* No precise measurements were taken, nor were problems broken down and fully analyzed. No troubleshooting was done. The costs cited here in most cases should give you pretty good *ballpark* figures for the types of repairs involved. If you need firm numbers for negotiating or decision-making purposes, you *must* get actual *bids* from contractors willing and able to effect repairs.

Rusty Layton
ASHI Certified Home Inspector #392

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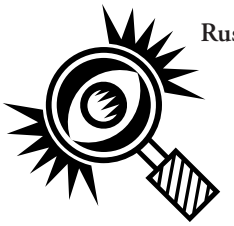
Replacement Costs

Component	*Avg Life*	*Cost to Replace*
Air Cond. (indoor coil)	25-40	$350-550
Air Cond. (window)	15-20	$250-500+
Air Cond. (outside unit)	13-18	$1,200-2,000
Boiler (hot water heat)	45-60	$2,000-3,500
Clothes Washer	8-15	$350-600
Clothes Dryer	15-30	$300-500
Dishwasher	10-15	$350-700
Disposer	8-15	$150-300
Furnace, gas or oil	20-30	$1,400-2,800
Furnace, electric	25-40	$1,500-2,000
Heat Pump	11-20	$1,300-1,800
Microwave oven	15-25	$350-650
Range (cooktop)	15-30	$450-650
Range (unitary)	15-30	$300-1,200
Refrigerator	15-25	$500-1,200
Water Heater (gas)	10-20	$450-600
Water Heater (electric)	8-16	$450-700
Asphalt shingle	15-25	$1.40-1.75 sq.ft.
Cedar shingles	15-25	$3.50-5.00 sq.ft.
Cedar shakes	20-27	$4.00-6.50 sq.ft.
Membrane	20+	$4.50-5.50 sq.ft.
Metal	50+ possible	$5.50-8.00 sq.ft.
Roll roofing	5-15	$1.00-2.00 sq.ft.
Slate	45+	$6.00-8.50 sq.ft.
Tar-and-gravel	11-20	$2.00-3.50 sq.ft.



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