

Example



Inspecting  
Real Estate  
Since 1994

**AAD Inspection Corp.**

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# Home Inspection Report



**1234 Any Street  
Boise, ID 83700**

Inspection Date: mm/dd/yyyy



Example



Subject Property: **1234 Any Street, Boise, ID 83700**

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**AAD Inspection Corp.**

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# GENERAL SERVICE AGREEMENT

(PLEASE READ CAREFULLY)

Between: **AAD INSPECTION CORP.** (Company)

And: **A. Buyer** (Customer)

Re: **1234 Any Street, Boise, ID 83700** (Subject Property)

The Company agrees to perform an inspection and prepare a report to enhance the Customer's knowledge of major systems and aspects of the Subject Property. Information conveyed will consist of professional opinions, only, and will be based upon the Company's customary efforts to maintain accuracy.

While the Company strives to discover and report in a manner that can significantly reduce the Customer's future possible health, safety, and financial risks, the Customer agrees that it is not reasonably possible to eliminate all such risks through the procurement of this inspection service. It is further understood and agreed that the inspection may be limited to readily accessible areas of the property and that the report will be based upon observations of apparent conditions existing at the time of the inspection. The Company shall not be required to dismantle items or systems, move, remove, or lift personal property, debris, or snow in order to perform the inspection, but may do so at its option. The Company is not responsible for the discovery or reporting of latent or concealed defects or deficiencies. (The Company cannot perform a functional inspection on a system if its respective public utility has been shut off.)

The inspection and report might not address and are not responsible to address the possible presence of, or danger from, any potentially harmful substances or environmental hazards including (but not limited to) radon gas, lead paint, asbestos, urea formaldehyde, toxic or flammable chemicals, or water and airborne hazards. Any information that may be conveyed by the Company for the benefit of the Customer with regard to such hazards is not to be construed as being in compliance with inspection or reporting protocols of any regulatory bodies unless such compliance is specifically claimed in the report.

This company and its inspectors are not licensed or insured as pest, fungus, or mold/mildew inspectors. Any information that may be conveyed by the Company for the benefit of the Customer with regard to pests or bio growths, or conditions conducive to their attraction or proliferation is made without warranty. These services are available from others licensed or certified in their respective fields.

The inspection and report do not address compliance or certification regarding past or present governmental codes or regulations of any kind. We are not code inspectors.

**THE COMPANY IS NOT GENERALLY AN INSURING AGENT.** However, the Company provides both a "**200% Satisfaction Guarantee**" and a "**90-Day Limited Structural & Mechanical Home Warranty**", which are both made part of this contract. The inspection and report are not generally intended as (or to be used as) a guarantee or warranty (express or implied) regarding the adequacy, performance, or condition of any structure, item, or system. All warranties outside the scope and responsibilities expressly stated herein and in the attached "**200% Satisfaction Guarantee**" and in the "**90-Day Limited Structural & Mechanical Home Warranty**" (both express and implied) are disclaimed, including any warranty of merchantability or of fitness for a particular purpose.

In no case shall the Company be liable to the Customer for any special, incidental, or consequential damages. In no event shall the Company's total liability to the Customer for damages, losses, and causes of action, whether in contract, tort (including negligence and malpractice), or otherwise exceed the amount actually paid by the Customer for the Company's inspection and report, except as expressly stated in the aforementioned "**90-Day Limited Structural and Mechanical Home Warranty**".

If legal action is brought against the Company for any reason, the Customer agrees to pay reasonable expenses for pro se defense or representation by an attorney if the Company prevails.

The Customer agrees to hold     Your Favorite Agent & YFA Realty     forever harmless regarding liabilities for any or all consequences arising from the inspection and report.

The use of any information conveyed through the inspection and report by any party shall be deemed as a contractual understanding, acknowledgment, and acceptance of all terms of this agreement.

# Explanation of **Our 200% Satisfaction Guarantee**

Our 200% Satisfaction Guarantee

**If, when you receive your inspection report, you feel that you are unable to rely on our services with confidence, we will return your full inspection fee and reimburse you for another inspection of your choice ... up to the amount of our original fee.**

**Our promises of excellent service to you are so important to us that we are willing to back them up by as much as 200%**

Notice of dissatisfaction regarding your service expectations must be given within 24 hours of receiving your inspection report, as we realize time is of the essence for you in your transaction. However, please remember that our 90-Day Limited Structural and Mechanical Home Warranty also provides meaningful coverage by us far after we've completed your inspection and delivered your report. Therefore, we urge you to consider keeping it in force.

# 90-Day Limited Structural and Mechanical Home Warranty



[FOR FULL HOME INSPECTIONS, ONLY]



This Limited 90-Day Structural and Mechanical Home Warranty is provided solely for the benefit of the person(s) designated on this form, below, as “Beneficiaries”, regarding the subject property designated on this form, below, as “Inspected Home Street Address”. This warranty becomes effective on the date of the home’s inspection and continues for a period of 90 days or 21 days after the actual closing date of the purchase and sale contract, whichever occurs later. Benefits under this limited warranty cover failures of listed covered items, only, which occur after the Beneficiaries have legal possession, and are subject to all exclusions set forth, below. Notice of claims must be received by AAD Inspection Corp before the expiration date to be valid. (We suggest providing written notice to serve as proof of notification.)

## WHAT MECHANICAL COMPONENTS IN MY HOME ARE COVERED?

Under PLUMBING: Components covered – all supply and drain piping, plumbing fixtures, water heaters, gas lines, and valves (excluding main shut-off valves, service stop valves, water heater valves, laundry valves, and water conditioning or filtering equipment). Under ELECTRICAL: Components covered – main service panels, subpanels, switches and receptacles, and lighting fixtures (excluding bulbs & fluorescent tubes). Under APPLIANCES: Components covered – free-standing ranges, drop-in ranges and other built-in cooking appliances, built-in dishwashers, built-in microwaves, trash compactors, garbage disposers, and garage door openers. Under CLIMATE CONTROL: Components covered – all primary, built-in heating and air conditioning system components serving living spaces. (All coverage is subject to the exclusions set forth below.)

## WHAT STRUCTURAL COMPONENTS IN MY HOME ARE COVERED?

Under FOUNDATIONS: Components covered – poured concrete and masonry-block foundations under living spaces. Under FRAMING: Components covered – all structural framing. Under ROOFING: Components covered – roof sheathings and roof coverings, together with associated flashings, roof jacks, and drip edges (limited to repair of leaking areas, only). Under GARAGE DOORS: Components covered – vehicle doors for garages attached to homes with living spaces, only. (All coverage is subject to the exclusions set forth below.)

## WHAT IS EXCLUDED UNDER THIS LIMITED WARRANTY?

Any item or component not specifically listed above as covered. All secondary or consequential damages. Items listed in the subject full home inspection report as defective, needing further professional evaluation, not verifiable, not inspected, or not visible at the time of the inspection. Cosmetic repairs. Water damage in any form. Items embedded in, beneath, or behind concrete. Damages caused by negligence subsequent to the subject inspection. Any climate control system, water heater, or covered built-in appliances 10 years of age or older (except for dishwashers 5 years of age or older). Removal and repair or replacement of walls, floors, roof, concrete, or other items to access failed components that are covered under this limited warranty. Blocked pipes. Sewage treatment systems. Damage due to (or mitigation of) mold in any form. Improvements, modifications, or upgrades made solely for the purpose of bringing up to code, rule, or regulation. Service calls to perform routine maintenance and service. Fireplace and chimney repairs. Concrete cracking or scaling. Interior and exterior painting and all other maintenance items. Any damage caused by vermin (insects, termites, rodents, etc.).

Roof repair is limited to repair of the immediate leakage or damaged area, only. Repairs and/or replacement materials will be completed in substantially the same kind and quality of material. All mechanical coverage is limited to within the footprint of the foundation of the home or buildings having covered living spaces and to a maximum of \$500. All structural coverage, including foundation and roofing, is limited to within the foundation footprint of the home or buildings having covered living spaces and to a maximum of \$2,000. Indemnification from all loss is not implied by this limited warranty.

## CLAIMS PROCEDURES (We welcome your phone calls, too ☺)

AAD Inspection Corp reserves the right to inspect the subject system or component *before* repairs or replacements are made and *before* committing to paying claims under this warranty. Therefore, the Beneficiary is highly encouraged to contact AAD as early as possible in the event of a possible claim. (AAD is often able to avert unnecessary expense or other trouble by becoming involved as early as possible.)

Notification of claim must be received (preferably in writing) by AAD Inspection Corp., 3288 Sweetwater Dr., Boise, ID 83716, or by phone at 208-338-9144, or by e-mail at s@aadinspections.com before the expiration date of the limited warranty period. Please provide a brief summary of the problem and include your name, complete address, and the home inspector’s name. It would be helpful to also include a copy of an itemized estimate or repair bill with a breakdown of parts, labor, and the specific cause for the failure from a qualified repair person. (AAD Inspection Corp. reserves the right to inspect the failure, talk to the repair person, or request up to two additional estimates.)

Beneficiaries	Inspection Date
<b>A. Buyer</b>	<b>mm/dd/yyyy</b>
Inspected Home Street Address	
<b>1234 Any Street, Boise, ID 83700</b>	

# Suggestions for Understanding and Using This Report

## **No property is perfect.**

Every building has imperfections or items that are ready for maintenance. It's the inspector's task to discover and report these so you can make informed decisions. This report should not be used as a tool to demean property, but rather as a way to illuminate the realities of ownership.

## **Maintenance costs are normal.**

Building owners should plan to spend around 1% of the total value of a property in maintenance costs, annually. (Annual costs of rental property maintenance are often 2% or more.)

If considerably less than this percentage has been invested during several years preceding an inspection, the property will usually show the telltale signs of neglect; and the new owner may have to play "catch up" with large sums of money and time.

## **This report is not an appraisal.**

When an appraiser determines worth, only the most obvious conditions of a property are taken into account to establish a conservative valuation. In effect, the appraiser is usually only representing the interests of a lender. Building inspectors focus more on the interests of the prospective buyer; and, although inspectors must be careful not to make any statements relating to property value, their findings can help buyers more completely understand the true costs of ownership.

## **This report may include (upon specific request) cost estimates for repair or replacement of certain items.**

Where estimates are given, they may appear as a range of possible costs. The low figure of the range is the inspector's best guess of current material costs, alone – the higher figure of the range includes reasonable retail profits on the materials, together with reasonable labor costs, overhead, and profit for qualified contractors. Nonetheless, the client is encouraged to obtain several bids from licensed or otherwise qualified contractors before agreeing to any work.

## **This report may include estimates of normal useful lives for certain items.**

Where estimates of normal, useful life for any components or appliances are offered in the report, the inspector is relying upon widely published data for similar items or systems. When these data are compared to known or estimated ages given in the report, the client may form his or her own opinions as to likely remaining life.

## **We offer future assistance at no cost.**

If you find yourself needing a second opinion regarding repairs or renovations at any time in the future, please give us a call. Most of the time, we should be able to help you avoid high-pressure marketing tactics or costly errors in judgment. Consultation by telephone costs you nothing. We encourage you to continue to trust us for timely and meaningful advice whenever you need it.

**If You Have Any Questions** please feel free to contact us at any time. We will be happy to discuss your report or provide further maintenance tips.

(Master copies of all reports are kept in our files for future reference.)

**Good Luck! We wish you the best!**

# REPORT OVERVIEW

Dear A. Buyer,

Thank you for choosing us as your building consultants.

Please review this report carefully before releasing your contingency.

If you need further explanation regarding this property's conditions, please don't hesitate to call:

Our 24-hour, 7-day office number is: (208) 338-9144.

Sincerely,



*Stan Audette*

Stan Audette, building consultant

Inspection date:	mm/dd/yyyy
Property address:	1234 Any Street Boise, ID 83700
Occupancy status:	Vacant
Date built/remodeled:	2019 (0 years)
Current weather:	Above 70°F. Sunny.
Recent weather:	Upper 90's, Hazy, Dry
Customer(s):	A. Buyer
Referring (Buyer's) Agent:	Your Favorite Agent
Agency:	YFA Realty
Listing (Seller's) Agent:	Sellers Agent
Agency:	SA Realty
Attending Inspector(s):	Your Inspector of Choice (Access with IMLS Affiliate Key)
Others in attendance:	Landscaping contractors (entire time)

Subject Property: **1234 Any Street, Boise, ID 83700**

# **INSPECTION FINDINGS**

## **(Inspection Issues, Defects, Imperfections, Etc.)**

Only defects, imperfections, safety issues, or maintenance concerns are reported in this section. If no issues are published concerning a particular component or system, then it may be assumed that it is “serviceable” in its present state, or that its condition is typical and normal for the age and style of the property.

### **Major Issues:**

These are findings of consequence to the safety, soundness, sanitation, or future integrity of the property that may *individually* require more than \$1,000 to cure. (They may be listed in random order).

1. No “Major Issues” were noted ☺.

NOTE: Whether any issues are listed in this category or not, it’s entirely possible that any of the other issues, imperfections, or facts that I’ve listed elsewhere in this report could conceivably cost more to address to the satisfaction of a prospective buyer than the \$1,000 threshold I’ve arbitrarily defined for this category to help clarify perspectives.

### **Lesser Issues:**

These are findings of consequence to the safety, soundness, sanitation, or future integrity of the property, which *individually* are likely to (or may possibly) require less than \$1,000 to cure. (They may be listed in random order.)

2. The local shutoff box for the condenser coil is a little loose at its connection to the siding, as shown in the following photo.



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3. One or more of the foundation's perimeter vents have soils and/or landscaping materials either touching or partially covering them, as exemplified in the following photo. Placing vent wells (small dams) in front of them would help keep their wooden frames from being subjected to various forms of wood-destroying organisms and help prevent partial restriction of the important cross-flow ventilation intended for the crawl spaces under the home.



4. The trim wrap of the front entry support posts and the rear patio siding/ledger board are contacting the concrete slab below them, as exemplified in the following two photos.



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This can encourage moisture to wick up into the trim, which can lead to possible deterioration. Siding and trim should be held at least 1 inch above concrete to help prevent such issues. Furthermore, the materials behind and below the siding and trim should be protected with flashing designed and installed to effectively prevent water entry behind the concrete.

5. One or more gutter downspouts discharge where their water cannot continue to flow adequately away from the foundation, as exemplified in the following photo. I suggest modifying the downspouts or the grading to help keep water from ponding against the house. I also suggest monitoring any adjacent below grade spaces for evidence of exterior surface water infiltration after periods of heavy rains or intense irrigation.

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6. The ledger board for the rear-facing sliding glass door has been caulked, but not yet painted to adequately protect it against the elements, as shown in the following photo.



7. Some of the caulking is starting to split along the seams of the siding and trim around the home, as exemplified in the following photo. This can eventually allow water entry resulting in swelling.

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8. Some of the saw-cut edges of the window trim around the home are partially unpainted, as exemplified in the following photo. This can allow water entry and resultant swelling.



9. Construction scraps containing cellulose (wood or paper products) have been left in the crawl spaces under the structure, as exemplified in the following photo. Since these scraps can eventually attract various wood destroying organisms, I recommend that they be removed.

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10. One of the mounting straps has come loose from a drain pipe in the crawlspaces under the main-floor front left living room, as shown in the following photo. These steel plumbers straps should be installed every four feet along horizontal runs of plastic drain pipe to maintain adequate support and consistent slope for the drain system.



11. I found two sections of interior footing curbs in the crawlspaces under the front entry with no pony wall supports, as shown in the following photo. Occasionally, I find footing curbs in the crawlspaces that are not part of the original blue prints, and were poured needlessly. However, I suggest verifying with the builder/framing contractor whether or not pony wall intermediate supports are necessary at this location.



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12. The foam insulation along the larger of the two A/C refrigerant lines in the attic has been torn in a few areas, as exemplified in the following photo. This can cause condensate to form and drip onto the insulation and sheetrock below. Therefore, I suggest repairing the insulation to cover essentially all the copper surfaces.



13. One or more nail heads are not flush with the siding material around the home, as exemplified in the following photo. This can more easily allow the nail heads to back out and let damaging moisture into the siding materials.



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14. One or more screw heads are uncaulked on the trim at the front entry, as exemplified in the following photo. These can be possible entry points for moisture that will eventually lead to swelling.



## Cosmetic Issues:

These issues apply to imperfections that have *no bearing* upon the safety, soundness, sanitation, or future integrity of the property, but which may be of concern to the Customer, regardless of likely or possible cost to address. (They may be listed in random order.)

- a. I found staining on some of the fascia boards where no gutters are installed, as exemplified in the following photo. Gutters are not required, but could help prevent this condition.

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b. I found some paint splatter on the louvers of the kitchen exhaust vent cap, as shown in the following photo.



c. I found a few nicks and dings in the siding and trim around the home, as exemplified in the following photo.



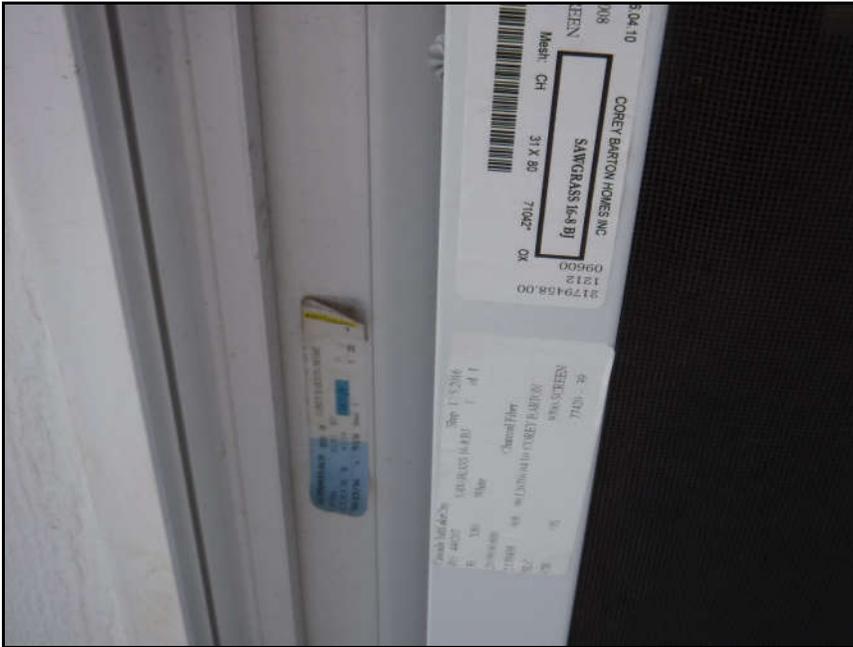
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- d. The manufacturer tags are still on some of the window and door frames, as exemplified in the following photo. If they are removed soon enough, they might not leave so much mastic residue and/or paper behind. (Their removal at this time would also allow touch-up painting, if necessary.)



- e. The concrete foundation walls have some minor vertically oriented cracks that should be considered “cosmetic”, only, as exemplified in the following photo. Such cracks are typical for this climate and do not indicate any structural deficiencies.

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- f. I found one or more small cracks and/or splits in the wooden frames for a foundation vents around the home, as exemplified in the following photo. These do not indicate structural deficiencies. In fact, they could be easily glued/repared, so that the screens do not come loose.



- g. One or more of the siding boards are a little “wavy” at the left exterior, as exemplified in the following photo. However, this is only a cosmetic concern.

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- h. I found what appears to be paint splatter on the freeze-proof sill cock (exterior garden hose valve) at the left exterior, and on the siding below it, as exemplified in the following photo.

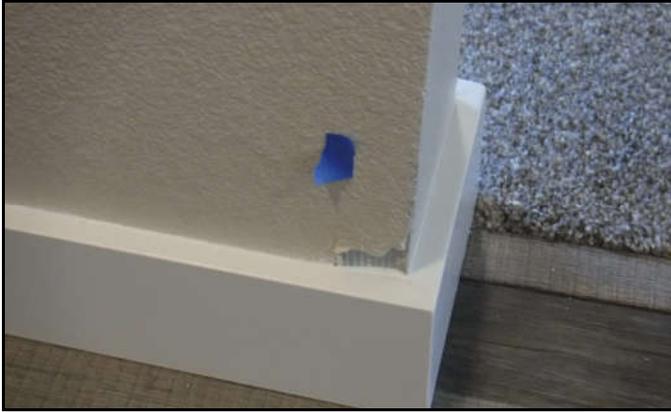


- i. Blue masking tape has been placed by others at many of the existing (remaining) cosmetic imperfections to indicate intentions to address these issues, as exemplified in the following three photos. This report may mention some of these or other cosmetic issues. However, this report does not intend to list all such cosmetic issues, as the blue masking tape, alone, is a very effective communication tool.





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- j. The concrete floor inside the garage is a little soiled, as exemplified in the following photo. However, this will likely be addressed during the final cleanup.



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- k. The baseboard molding and sheetrock surfaces throughout the home are not perfectly straight, as exemplified in the following photo. However, this condition likely falls under the quality guidelines set forth by the NAHB (National Association of Home Builders), which is an industry-wide, self-regulating standard of care. With respect to the straightness of wall, they should not be more than  $\frac{1}{4}$  inch crooked within any horizontal span of 4 feet. Nonetheless, this is a cosmetic consideration, only.



- l. The interior surfaces of this property have less than the typical amount of blemishes, scratches, dents, scuffs, or dings that may require repair in order to present the best possible visual appearance, as exemplified in the following four photos.

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- m. I found a few smudges of potential paint splatter on some of the window glass around the home, as exemplified in the following photo.



- n. The manufacturer's ink stamps are "bleeding" through the paint on the soffit sides of the fascia around the home, as exemplified in the following photo. Some of these areas are visible from the interior of the home. I believe that thicker paint coatings would effectively mask the printing, if desired.

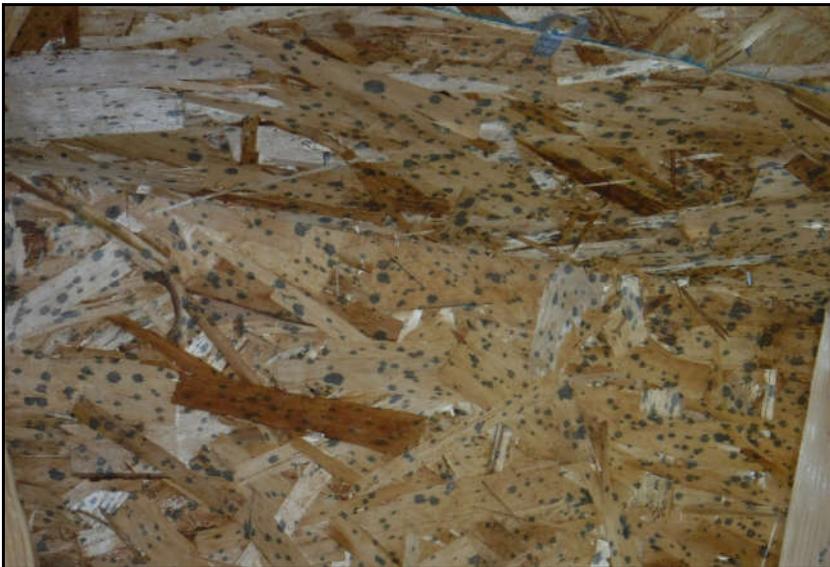


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- o. I found a few specks of paint chips and other small pieces of debris throughout the interior, as exemplified in the following photo. However, this will likely be addressed during final cleanup.



- p. I found specks of ink splatter on the attic side of the OSB roof sheathing, as exemplified in the following two photos. This occurs during manufacture, and is strictly cosmetic. (Some people may erroneously mistake these splatters as biogrowths.)

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- q. The partition wall at the front of the garage interior between the left and right bays is not centered above the concrete footings. However, this should be considered mostly cosmetic.
- r. The decorative handle is loose on the exterior side of the smaller overhead door, as shown in the following photo.



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- s. I found a few nails and other construction debris in the landscaping around the property, as exemplified in the following two photos. However, this will likely be addressed prior to closing.



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## FYI (For Your Information):

The following additional information and considerations are provided to help enhance your knowledge of the property. However, this information is not intended to be material to purchase or sale negotiations.

- Our policy as building inspectors is to not functionally test (open or close) main shut-off valves, laundry valves, water heater valves, water conditioning valves, filtering equipment valves, or service stop valves leading to plumbing fixtures during the inspection. These valves are not meant to be frequently operated and are installed mostly for maintenance. Please refer to further discussion regarding this issue, which I have included in the section titled “Ownership Tips for this Particular Property” near the end of this report. Because it is not reasonable for us to operate these valves during our inspection, all such aforementioned valves are specifically excluded from coverage under our 90-Day Limited Structural and Mechanical Home Warranty.
- As building inspectors, we typically inspect clothes dryer ducts for visually obvious disconnections, leaks, spewing of clothes lint, and runs that are too long or with too many bends. We cannot inspect the interiors of clothes dryer ducts; and we’ve discovered that perceptions of air flow rates can lead to false assumptions regarding the conditions at the interiors of these ducts.

We’ve learned that all clothes dryer ducts should be professionally cleaned at least every 2 years to reduce the risk of dryer-initiated fires. (Just because a person can feel air flowing from an exterior vent cap with the clothes dryer running does not mean the duct is clean enough to be safe.)

We also strongly suggest having the same professional simultaneously ensure that no clothes lint has built up anywhere in the appliance cabinet or in its hose connection to the dryer duct. [*One such local, trusted clothes dryer duct cleaning professional is Francis Burger of Boise Dryer Vent Cleaning. Mr. Burger's business phone number is 208-713-1581.*]

- This building has multiple levels of conditioned spaces, but only one HVAC system with no multi-zone thermostat controls. Therefore, it’s likely that the upper levels will become noticeably warmer than the lower levels. Please refer to further discussion regarding multi-level buildings with only one heating/cooling system, which I have included in the section titled “Ownership Tips for this Particular Property” near the end of this report.

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- I operated the primary HVAC equipment through normal user controls and visually inspected the major components without disassembly past that which would typically be performed by a homeowner. Any adverse issues found during this inspection are listed, above, in this report. The presence and locations of certain components can be found in the descriptive section of this “Full Inspection Report”.
- This home has a garage-to-interior door. Please refer to further discussion regarding self-closing fire doors, which I have included in the section titled “Ownership Tips for this Particular Property” near the end of this report.
- The method and extent of my inspection of the roof coverings can be found, below, in the descriptive section of this “Full Inspection Report”, together with my estimates of “Remaining Functional Life” and “Remaining Economic Life”. Any adverse issues found during this inspection are listed, above, in this report.
- The home includes conduit and low-voltage wiring for telephone, cable, and the Internet at the right front corner of the garage, as shown in the following photo. If these services are activated with any providers, their respective control boxes will be added at this location. (The white plastic cover provided over a “courtesy ground” terminal strip for the possible future utility providers can be seen near the bottom of the photo to the left of the gray plastic power conduit that leads upward to the electric meter.)



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- Essentially every type of buried water service piping is prone to eventual failure. Therefore, it's probably wise to consider purchasing the relatively inexpensive additional insurance offered through most water utility companies. The premiums for this type of insurance can usually be added to the utility billing, making it very convenient once put into effect. From past experience, I believe that risk of failure is probably highest with older galvanized iron piping. Older copper piping is in a close second. Next is probably blue polybutylene plastic piping (along with inappropriately chosen gray polybutylene, PVC plastic, or CPVC plastic, of course). At this time, black polyethylene probably has the lowest risk of failure.
- The pressurized irrigation shutoff valves for the sprinklers are located at the right rear corner of the property, as shown in the following two photos. I suggest regularly cleaning the filter, to reduce weeds in the lawn and the clogging of sprinkler heads.



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- Piping has been provided at the rear interior of the garage for a possible future water softener. However, no appliance is currently in place. NOTE: I strongly suggest that any further piping modifications for these purposes be made only by a licensed plumber.
- The fence around the back yard was in process of being installed during the inspection, as exemplified in the following photo. Similarly, some of the landscaping rock was being placed around the perimeter of the foundation. It is my understanding that the backyard landscaping is included with the purchase of the home, and will likely be completed prior to closing.



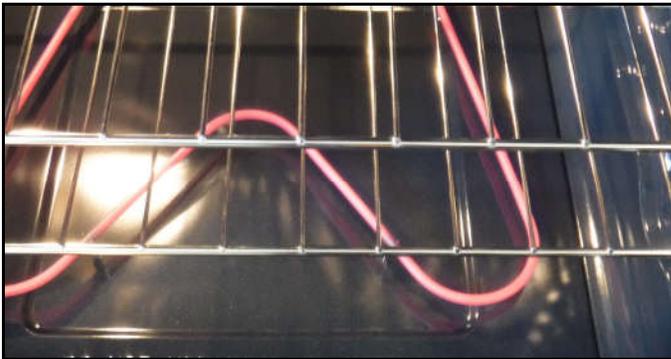
- The overhead garage door keypad could not be tested, as the code was not made available to the inspector at the time of this inspection.
- The dishwasher was operational, as shown in the following photo.

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- The exterior-mounted light fixtures at the front of the garage are controlled by a photocell and were not tested at this time. (I suggest verifying proper operation of this circuit after dusk.)
- The heating functions of the free-standing electric range were all operational during this inspection, as shown in the following three photos.



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- Gutters are not installed on all eaves of the home. However, none are required by codes.
- The air inlet in the ceiling of the mechanical closet for the furnace does not have a register cover or a mesh screen to prevent potential pest access to the interior of the home, as shown in the following photo. (Typically, a ¼-inch mesh screen is placed over the exterior opening of this combustion-air path.)



- The first few times that the freestanding electric range is turned on, the homeowner may note an unpleasant smell and/or subtle amounts of smoke emitting from the oven ventilation. This is “normal”, as a protective coating is applied to the interior of the oven, and burns away during the first few uses. I suggest always using the exhaust fan while the range is in use.
- The precaution of applying matching silicone caulking in all bathrooms and laundry rooms or kitchens not only along the joints where sheet vinyl floor coverings meet the fronts of tubs or showers, but also around their entire floor perimeters can help prevent future water damage. When water gets on vinyl floors, it doesn’t always stay next to the water sources. This additional precaution is not “required” or “expected” of builders or sellers, but tends to offer extended

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protection against the possibilities that escaping waters can get under the inlaid vinyl to cause eventual swelling of particleboard underlayments, or cause discolorations of the floor coverings.

- The bottom edges of the siding and trim are somewhat unpainted in several locations, as exemplified in the following photo.



This often leads to water absorption and eventual swelling. Therefore, I suggest adding primer and paint to the bottom edges of all siding and trim adjacent to the foundation and around windows to help protect against water damage.

NOTE: Most local builders and painters will not paint these areas unless specifically contracted to do so.

- One or more windows have little or no caulking around their frames at the exterior, as exemplified in the following photo, as exemplified in the following photo.



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However, if the windows are properly installed (with caulking behind their nail fins and with flashing tape applied around their frames before the siding was installed), the only remaining concern might be future swelling of trim boards, themselves. Therefore, periodic monitoring for swelling or other signs of water entry is a good idea.

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## **DESCRIPTIONS OF MAJOR SYSTEMS & FEATURES**

Only those components, systems, or features which exist on the property are included in this section. If an existing component, system, or feature was not inspected, the reason for not inspecting it will be published.

### **Foundation**

Description of foundation system: Cast-in-place concrete footings and stem walls form the perimeters. Intermediate support is provided by pony walls (short wood stud walls) atop footing curbs in the crawl spaces.

### **Crawl Spaces**

Method of inspecting crawl spaces: Crawled to all areas.

Location(s) of access points: Stairway closet floor.

Description of vapor retarder: 6-mil-thick black plastic vapor barrier sheeting with about 98% coverage.

Type and thickness of perimeter insulation: None.

Type and thickness of under-floor insulation: Unfaced fiberglass batting.

### **Gutters & Downspouts**

Descriptions: Metal gutters and downspouts. One or more leader chain downspouts.

### **Roof Coverings**

Method of roof inspection: Viewed by walking upon the lower roof surfaces. Upper roof viewed from eaves, only.

Current roof covering: Architectural composition shingles (typical 30-yr lifespan).

Estimated current age: New.

Number of courses in place: One, only.

Estimated "Remaining Functional Life"\*: 25 to 30 years.

Estimated "Remaining Economic Life"+: 22 to 27 years.

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- \* **“Remaining Functional Life”** is the amount of time left before an average building owner would choose to replace a roof because of leaks occurring that are too numerous or expensive to simply repair.
- + **“Remaining Economic Life”** is the amount of time left before a roof would most likely need to be replaced in order to satisfy a prospective buyer who may be receiving advice from a roofing repair contractor or other inspector. (Most prospective buyers and some lenders like to be assured that at least 3 to 5 years of “useful life” remain.)

## Roof Structure & Attic

Accessibility and/or method of inspecting attic: I entered and viewed all accessible unfinished attic spaces.

Location(s) of Accesses: Entry hatch up through garage ceiling. Upstairs left center bedroom ceiling.

Roof framing: Engineered truss system.

Roof sheathing (decking): OSB (Oriented Strand Board) sheathing.

Type and thickness of insulation: About 14 inches of blown-in fiberglass over the living spaces, only.

## Walls (Interior & Exterior)

Perimeter wall structures: Stud wall construction.

Partition wall structures: Stud wall construction.

Exterior surfaces: Fiberboard siding, with fiberboard trim, painted. Faux-Stone masonry veneer at the front, only.

Interior surfaces: Sheetrock, taped, textured, and painted.

## Ceilings & Floors

Ceiling structures: Bottom cords of trusses.

Floor structures: OSB (Oriented Strand Board) subflooring over “I”-beam joists and pony-wall supports.

## Windows

General descriptions: Vinyl-framed, thermal-paned.

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## Service & Entrance Panels

Service type: Underground service.

Location of main electrical power shut-off: In the main circuit breaker panel box.

Service amperage and voltage: 200-amps (120/240 volts)

Service entry conductor materials: Stranded copper.

Locations of meter, main, and subpanels: The meter is located at the right front corner of the home. The main distribution panel is located at the interior wall of the garage, just inside from the meter.

## Branch Circuits

Types of overcurrent protection: Circuit breakers.

240-volt conductor materials: Stranded aluminum. Solid copper.

120-volt conductor materials: Solid copper.

Wiring Methods: The branch circuits of this building are grounded.

## Gas Supply

Type of gas: Natural gas, as provided by Intermountain Gas Company.

Location of hydrant or tank and main shut-off valve: Right exterior.

Points of use: Water heater. Central furnace.

## Heating Equipment

Type: Central furnace.

Energy source: Natural gas.

BTU's/hr or kilowatts heating capacity: 88,000 BTU's

Location: In the mechanical closet on the left side of the upstairs hallway.

Approximate age: New. [*Most gas furnaces and electric heat pumps last from 12 to 18 years. Most oil furnaces last from 18 to 25 years. Most gas boilers, ceiling-hung space heaters, and wall furnaces last from 30 to 40 years. Most electric space heaters, forced-air central heaters, and baseboard heaters last 30 years or more.*]

Method of heat distribution: Central, forced-air system, with ductwork.

Filter types and locations, if applicable: Located behind the hinged cover of the return-air grille. (This is a great location because it's easy to see when the filter is dirty.)

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Manufacturer: Lennox  
Model No.: ML180UH090P48B-55  
Serial No.: 1719A03072

## Cooling Equipment

Type: Refrigerative, air-to-air central conditioning system.

Energy source: Electricity.

Cooling Capacity: 3-ton.

Location of outdoor compressor (condenser) unit: Right exterior.

Approximate age: New. [*Most air conditioners and heat pumps last from 12 to 18 years. Most window- or wall-mounted room coolers last from 10 to 15 years. Most evaporative ("swamp") coolers last from 8 to 15 years.*]

Method of cool-air distribution: Central forced-air, integral with the heating system.

Comments (for refrigerative systems, only): If the outdoor air temperatures at the time of this inspection were below 45°F, our policy is to NOT attempt to start and run a refrigerative appliance. If the outside air temperatures are above 45°F, our policy is to attempt to start and run a refrigerative appliance. However, we do not expect meaningful cooling performance data until or unless the outdoor air temperatures are above 70°F. Therefore, until or unless the outdoor air temperatures are recorded as being above 70°F at the time of this inspection, we cannot warrant the performance of any A/C system.

Manufacturer: Lennox  
Model No.: 13ACXN036-230-22  
Serial No.: 1919A09260

## Ducts & Vents

Descriptions: Insulated in the attic spaces.

Comments: The ductwork was inspected for continuity only where visible access was available.

NOTE: Although air flow may be discernible at supply registers, building inspectors are not able to determine whether the availability and balance of air flow is acceptable to all prospective occupants.

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## Water Supply Systems & Fixtures

Source of domestic water: Public water system.

Location of main shut-off valve: Under the floor at the crawl space opening.

Supply piping: The potable water service line into the building is of black plastic buried pipe. The supply piping throughout the building is mostly of PEX (Cross-linked Polyethylene) plastic pipe.

Comments: The pressurized water supply piping within the building was inspected only where visible and readily accessible.

## Drains, Wastes, & Vents

Type of collection system (if known): Public collection system.

Visible building drain piping materials: Black plastic.

Comments: The drain lines within the property were inspected only where visible and readily accessible.

## Water Heating Equipment

Energy Source: Natural gas.

Location of gas and/or water shut-off valves: Adjacent to the appliance.

Capacity: 50-gallon.

Model year (or date of installation): 2019 [*Most gas water heaters last from 12 to 18 years. Most electric water heaters last from 20 to 40 years.*]

Location: In the garage.

Manufacturer: Bradford White

Model No.: RG250T6N

Serial No.: TE43427661

## Dishwasher

Dishwasher Type: Built-in, under-the-counter.

Manufacturer: Frigidaire

Model No.: FFC2413US1A

Serial No.: TH91110018

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## Food Waste Disposer

Manufacturer: Evergrind  
Model No.: E101-2A  
Serial No.: 19061033869

## Kitchen Exhaust

Type: Built-in Spacesaver<sup>®</sup>-style microwave with exhaust fan, above the range.  
This appliance vents to the exterior.

## Major Cooking Appliances

Descriptions: Free-standing electric range.  
Location of gas shut-off valves (if applicable): N/A..

Manufacturer: Frigidaire  
Model No.: FFEF3054TSH  
Serial No.: VF91726489

## Microwave Cooking Equipment

Description: Built-in Spacesaver<sup>®</sup>-style, above the range.

Manufacturer: Frigidaire  
Model No.: FFMV1645TS  
Serial No.: KG84109045

## Garage Vehicle Doors

Descriptions: Two, multiple-sectioned metal overhead.

Types of safety reversing (if present): The larger door has both electronic eye and force-sensitive stop-and-reverse functions in place. The smaller door is manually operated, only.

## Dryer Vent

Description: Rigid sheetmetal tubular ducting.



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Termination: The dryer exhausts up through the roof with an appropriate vent cap.

## Lawn Sprinklers

Source(s) of water: Pressurized irrigation system.

Type of Control: Electronic (with battery back-up).

Number of zones: 2 zones.

Comments: I did not functionally test the sprinkler system because the customer did not contract for that particular option.

## Fire Protection Equipment

Description: Both hard-wired and battery-backup. If one unit sounds, they all sound.

Comments: I suggest maintaining smoke detectors in every bedroom and in every other room or hallway that adjoins any bedrooms. Furthermore, it's always a good idea to have at least one detector installed at each living level or ceiling level that differs from the next by more than 2 feet.

I also suggest replacing smoke detectors at least every 5 to 7 years, as their sensors will usually begin failing after that period (even though their alarms will continue to sound when their test buttons are pressed).

Smoke detectors may be periodically checked for response to actual smoke by building owners. (Try using a short candle at the bottom of a tall glass jar. The candle will tend to produce a lot of smoke due to lack of oxygen, and the jar will keep hot wax off hands and carpeting. However, if such testing is done too frequently, the smoke may prematurely coat the sensors with a film that could block their sensitivity.)

Additionally, carbon monoxide detectors should be installed to protect all sleeping areas whenever combustion appliances are present in the building.

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## **OWNERSHIP TIPS FOR THIS** **PARTICULAR PROPERTY**

Each of the following subjects was included in this report because it pertains directly to this particular property. Each short article is written by our inspectors for the benefit of our customers in hopes that their ownership experiences will be enhanced.

### **Guarding Against Molds, Mildews, and Other Fungi.**

Molds and mildews (recently so often referred to as “toxic molds”) can grow anywhere in and around our buildings where the conditions are right. Molds need darkness, relative humidity above 50%, and organic food sources.

Sunlight will kill mold rather quickly. One way to kill mold or stop it from getting a “foothold” is to periodically let as much sunlight as possible into the areas where it might otherwise thrive.

Dry environments will not allow mold to grow. Even though mold spores may be present in almost any air, the spores must land on surfaces that can provide enough food and moisture for them to live. Otherwise they become dormant and eventually die. Surfaces that are being continually wetted or which never dry out can support mold colonies even when the surrounding air is relatively dry. However, if the air, itself, is continually above 50% relative humidity, the mold can thrive on otherwise dry surfaces.

Food sources can include even fine dust or lint that collects on otherwise indigestible materials. (This is how mold colonies are sometimes found on windows.) Wood, paper, or any other material containing cellulose can be a food source to molds. The significance of this is that most building materials contain these nutrients.

All these molds, mildews, and fungi produce spores that have been floating around in our daily environment for all our lives without causing much trouble for anyone. It’s the unique confinement of living spaces that lends itself to possibly harmful concentrations of these micro-organisms. That’s why we are learning to become more educated and more responsible with respect to mold.

Many types of molds typically found in today’s living environments may contain allergens that cause a wide variety of symptoms in individuals. These symptoms are most often related to the respiratory system, but may also involve rashes or dizziness. Not all people are allergic to these types of molds. Typically, people with compromised immune systems will be more likely to have allergic reactions. People suffering from asthma are particularly sensitive.

Some types of black molds have been identified as neurotoxins. These can cause severe, long-term damage to the nervous system. People can be hurt by these molds without ever developing outward allergenic symptoms. Although this type of injury is rather rare, it should make us more cautious with respect to threats from molds, in general.

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Allergy doctors can usually identify which of the known molds may cause allergic reactions in any individual, but the doctors are not equipped to tell that individual whether he or she may be exposed to those molds in their daily environment. Fortunately, Southern Idaho now has mold specialists who can survey a building and identify any molds or mildews that may be present (along with other possible airborne contaminants). Slide samples of molds or other fungi can be sent off to microbiologists for analysis. Air samples can be taken.

Southern Idaho also has several mold mitigation contractors trained in removing or treating mold and reducing the conditions that may be conducive to their proliferation. However, the EPA currently recommends involving certified remediation contractors only if the affected area of mold exceeds 10 square feet. (For areas less than that, building owners can usually feel confident in their ability to scrub away any mold with a 10% bleach solution.)

Regardless of the type or extent of mold remediation that might be required, the most important strategy is to remove the source of invasive moisture and to take steps to ensure that moisture does not return.

## Draw-String Window Coverings

Any of the popular window coverings that incorporate drawstrings to raise and lower them can be operated in a manner that will greatly extend their expected lives. Rather than using only the tension of the draw strings for raising the window coverings, one may do most of the lifting by placing one hand under the center of the window covering's bottom rail to support most of the weight while simultaneously keeping only mild tension on the draw strings. In this manner, the window coverings are not raised by the strings, but only held in place by the strings.

Conversely, when wishing to lower the coverings, one may hold the drawstrings in their "release" positions with only very slight tension. Then, rather than applying enough downward tension on the strings to cause the locking cams to release, one can gently lift the center of the bottom of the window coverings to release the cams. In this manner very little actual tension is required on the drawstrings to release the cam.

By following the procedures outlined above, very little wear occurs on the draw strings as they follow around their pulleys, and very little "tugging" is done on the window covering's attachment hardware to the window casings or walls. The window coverings will last much longer. I suggest teaching all occupants in a building to use these techniques.

## Trees and Shrubs Near Building Surfaces.

If trees or shrubs have branches that can touch the building, those branches should be kept trimmed back and away from those surfaces seasonally to avoid long-term wind-action abrasion damage. For this reason, we strongly recommend carefully planning the placement of any new trees or shrubs. It's wise to consult an arborist or botanist regarding the expected eventual sizes and shapes of all mature plantings. Whenever possible, the locations of such plantings should allow for at least 1 foot of clearance between the foliage and any building surfaces even after the trees or shrubs have reached full maturity. However, if trees or shrubs are already planted rather close to the building, we suggest seeking the advice of arborists or botanists as soon as possible to determine whether pruning,

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relocation, or removal would be the best choice. Please bear in mind that expert answers to these questions can save a lot of money, later, as trees and shrubs get more expensive to prune, relocate, or move when they get larger.

## Insurance Industry's C.L.U.E. Reports

The insurance industry maintains a database of risk factors associated with individual clients and with certain properties. The database functions much like a credit report. Most of the risk factors are associated with the financial habits of individuals; but some important data stays with the building. For instance: If a building has had a water damage claim, the insurance underwriters may be afraid of future claims deriving from molds or mildews.

This database is known as the C.L.U.E. (Comprehensive Loss Underwriting Exchange). The acronym is a clever play on words, as it pertains to giving insurance companies a "clue" regarding risks that could lower their profits.

Building owners should know that whenever they file a claim (or even call their insurance company to inquire as to whether they should file a claim) the information they give over the phone is most likely being entered into the C.L.U.E. database. This information can have grave and lasting negative effects on future insurability. For this reason, the insurance departments and commissioners of many states are taking proactive roles in educating consumers and in protecting them from misuse of these data. However, Idaho has not yet taken such action ... leaving consumers to protect themselves through self-education.

Therefore, I strongly urge building owners, buyers, and sellers to think twice about disclosing any water damage to their insurance companies. (This includes fire damage, as many fires are put out with water ... which, of course, often leads to associated water damage.)

Finally, I highly recommend asking your prospective building or homeowners insurance agent to be sure to obtain a CLUE report on this property before submitting a binder for insurance to your lender. (Failure to insist upon this important information *before* purchase of the building could possibly result in a surprise increase of premiums or even in withdrawal of the insurance once the insurance company has completed their due diligence.)

## Backflow Prevention Valve Codes and Inspections.

The State of Idaho requires all irrigation systems that are in any way connected to domestic water systems (including underground aquifers, by means of private wells) to have adequate means of preventing contamination of their associated domestic water sources. The state publishes detailed specifications for the design, installation, and performance of the required backflow prevention valves.

Idaho requires that certified inspectors inspect all existing backflow prevention valves, annually. The state and the local water providers have the right to immediately discontinue service to any point of final use that is not in compliance. (However, normally, some notice is given along with a reasonable time to comply.)

It is fair to note that enforcement of these laws has been sporadic and inconsistent, which explains why so many Idaho citizens are yet unaware of any need to comply. However, once an address is listed

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in the state's records as requiring backflow prevention, it is more likely that annual inspections will be tracked and compliance enforced.

The numerous older-styles of anti-siphon loops with ball-check valves and many other older backflow prevention devices that are no longer in compliance with today's codes cannot be accepted as "legal". There are no "grandfather" rights when it comes to public safety.

Further information about backflow prevention valves can be obtained from the State of Idaho Department of Environmental Quality (DEQ) at (208) 373-0413.

## **Self-Closing Garage-Building Entry Doors.**

Since most fires are known to originate in garages (because of the types of flammable chemicals typically stored in them), fire insurance companies have continually lobbied for greater improvements in the "fire barriers" between garages and adjacent parts of buildings when the garages are "attached" to those buildings.

Garage doors must now (since about 1993) not only be rated as "fire doors" with at least a ½-hour fire rating; but they must also be designed to self-close and successfully self-latch when released from a fully open position. This is usually accomplished by the installation of spring-loaded hinges.

However, many people seem to find the self-closing hinges to be a nuisance when carrying multiple sets of packages into the building from the garage. For this reason, I find that many garage-building entry doors have hinge springs that have been purposely relaxed.

I suggest, instead, that people install drop-down rubber stops that can be easily operated with one foot ... even while one's hands are full. Alternatively, magnetic or friction-catch doorstops can also work. These simple devices are inexpensive and easy to install. Their installation and use can avoid the typical frustrations of self-closing safety features, while maintaining the important fire barrier aspects of the doorway.

## **Sodium-Based Water Softeners.**

Some water sources (both private and public) may contain high concentrations of dissolved minerals that can build up and clog piping and faucet aerators or cause water heaters to fail faster. This condition, known as "hard water", can be measured to decide upon a course of action, if desired.

Most water softeners installed in residences use sodium-based ion displacement systems. This type of water conditioner forces the iron, calcium, potassium, and a number of other elements typically associated with "hard" water out of solution by super saturating the water with sodium. Sodium is easily obtained from salt that is rather plentiful, cheap, and easily dissolved into water. (That's why people need to keep refilling the salt canisters of water softeners.) The unwanted ions of the harder elements are deposited on the surfaces of resin beads and then flushed down the drain periodically to refresh (or recharge) the resin bed of the conditioner.

The high concentration of sodium in most "softened" water is usually detectable by making the water feel "slippery". Softened water not only prevents the buildup of harmful deposits on the inner surfaces of piping and plumbing fixtures, but also allows more lather to be easily produced with a given amount of detergent. (It saves on soap bills.) In contrast, it's the hard water that makes the "squeaky" sound on skin or dishes when they're being rinsed.

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It's important for anyone instructed by their physicians to maintain a low-sodium diet to avoid the consumption of water softened by many of the sodium-based systems. (Most people can drink sodium treated water without ill effects; but many people don't like the taste or feel.) Check with a knowledgeable dealer regarding the sodium contents of the water being treated by a particular installation, as some systems manage to keep the sodium levels much lower than others.

Also, if indoor potted plants are continually watered with high-sodium water, their captive soils may trap and accumulate enough salts to eventually kill the plants.

For these few above reasons, it is rather typical to have the plumbing modified to provide unconditioned water for human consumption or plant watering to one or more taps at the interior of the building. Most people also want to ensure that the water to the exterior sill cocks (hose connections) is not treated, which avoids needless salt costs.

Whenever the building's water piping is to be modified for the installation of a water softener subsequent to original construction, it is very important to realize many water softener dealers may not employ licensed plumbers. Since plumbing modifications should require a plumbing permit and code inspections, I suggest making it known to the water softener salesperson that necessary permits and inspections will be expected by the building owner. (I've seen too many poorly installed units and improper modifications to building plumbing that have caused extensive damage to buildings due to incompetence or poor workmanship.)

## **Tripping Hazards Along Public or Private Walking Surfaces**

Precedences set by governing agencies typically define any vertical disparity along a walking path as a "tripping hazard" if it is greater than 5/8 inch in height. These guidelines represent what attorneys feel are appropriate when prosecuting or defending trip/fall cases in courts of law. Therefore, as building inspectors, we try to follow these guidelines regarding the reporting of possible tripping hazards.

The need for such guidelines seems to begin with public right-of-way sidewalks. Sidewalks installed along public streets are part of the public's property, but the individual property owners usually have the responsibility for their maintenance. Likewise, if anyone is injured due to a tripping hazard anywhere in the right-of-way areas bordering their property, the individual owner(s) are usually liable, just as they would be for someone tripping or falling on their own property. However, although this liability can be very great, most people simply rely upon their building or homeowner's insurance to cover these risks.

There is one very important exception to the above-mentioned strategy, however! Local government agencies typically have the legal responsibility of ensuring that hazards along their rights-of-way are being addressed. If their department is made aware of a possible tripping hazard, they are legally obligated to investigate further. If their inspector finds that any hazard exists, then the property owner adjacent to the hazard may be contacted and be given instructions for repair as an ultimatum.

Most such governing entities will consider any abrupt vertical irregularity greater than 5/8 of an inch to be a tripping hazard. (The arbitrary 5/8-inch standard is a measure that their attorneys feel they can reasonably defend for not taking corrective action. However, any hazard—no matter how small—may still end up in court if someone trips and injures themselves.)

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If the property owners fail to accomplish the directed repairs in a timely manner, the government agency may have the work done and invoice the property owners. If the property owners fail to pay the invoice, a tax lien or other remedy may be placed against their title. (NOTE: All work done in the public rights-of-way must usually be done only by contractors who have been approved by the agencies having jurisdiction. This usually increases expenses far above those that the building owners would choose to incur on their own.)

Most governing agencies do not actively inspect sidewalks for hazards. They respond only to people who call in to complain about sidewalk conditions or to people who call to inquire about regulations. (This explains why most citizens can point to obviously hazardous areas in public sidewalks that have remained unaddressed for years.)

If the person receiving a phone inquiry regarding sidewalks is given a street address, then they are usually obligated to send an inspector to that address. This could trigger a very expensive chain of events for some property owners. Most of the people answering the phones at those offices will try to warn the callers not to give a specific address unless they wish to make a complaint.

My advice to building owners inquiring about the sidewalks, curbs, or driveways in front of their own property is to ask about general advice regarding right-of-way sidewalk regulations without giving out their specific addresses.

## Importance of GFCI (Ground Fault Circuit Interrupting) Devices

Over the past 40 or so years, the electrical code authors have begun to recognize the importance of increased protection against inadvertent small electrical shocks due to ground faults. Physiologists have discovered that electrical currents as small as 30 to 60 milliamps per square centimeter passing through a heart muscle can cause fibrillation. This is probably the most serious condition that electrical currents can produce. Once a heart goes into fibrillation, it usually requires a defibrillator to save the patient. (Most of us don't have this type of equipment nearby.) Ironically, if greater amounts of current pass through the heart muscle, it's far more likely that the heart will simply spasm in response to the shock and then regain its normal rhythm.

Research has found that older people and persons with unsound hearts are much more susceptible to small shocks that might be below the threshold of perception of younger, healthier people. For this reason, it's quite possible that a malfunctioning appliance in a building could be creating small shocks that don't bother one user, but which could kill another user.

The electrical industry has addressed this danger by requiring the installation of protective devices (commonly known as GFI's, for Ground Fault Interrupters) to serve all outlets that are within six feet of plumbing fixtures or major appliances likely to have exposed surfaces directly connected to ground. Outside outlets and outlets over bare concrete surfaces are also required to have this type of protection.

These GFI devices are usually set to open (trip) a circuit if an imbalance of current flow between the "hot" and "neutral" conductors greater than 10 milliamps is measured. While some of these devices are incorporated into GFI-type circuit breakers, the more modern implementation is the use of GFCI (Ground Fault Circuit Interrupting) duplex receptacles ... the outlets having special "test" and "reset" buttons.

The GFCI outlets were originally designed for use on fully grounded circuits, i.e., circuits having a black, white, and a bare ground conductor. However, these outlets can also be appropriately applied



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to ungrounded circuits. (This is a little-known fact within much of the industry, which otherwise appears to be in conflict with the general rule about allowing only 2-hole outlets ungrounded circuits.)

NOTE: The locations and degree of implementation of GFI-type devices has changed dramatically over the past 30 or so years, according to codes adopted by various authorities. (One cannot expect all older buildings to be in compliance with today's codes.)

## Importance of AFCI (Arc Fault Circuit Interrupting) Devices

It's been known for many years that certain wiring problems can cause fires before the actual current ratings of the conductors are exceeded. Fuses and circuit breakers have traditionally been the only line of defense against overloaded circuits that can generate enough heat to ignite nearby combustible materials in residences. The sizes of these fuses or circuit breakers are based upon the sizes and types of wiring designed and insulated to carry the necessary load currents.

However, it's all too common that smaller amounts of current can find paths through poor wiring insulation that can generate more heat than the engineers predicted. When this occurs, fires can start.

The types of paths that electrical currents can follow when they escape their intended circuits are known as "faults". When the current has to jump through or past poor insulation to follow a fault path, it must usually form an "arc" through the air or through insulation that has high resistance to current flow. Therefore, these types of wiring failure are referred to as an "arc faults".

Arc faults tend to generate high amounts of heat in very small spaces without involving large amounts of electrical current.

The following short list defines some examples of wiring problems that can generate arc faults:

- a) Extension cord insulation becoming frayed by being walked upon under a throw rug
- b) Appliance cords being pulled around sharp corners.
- c) Rats or mice chewing on wiring insulation in walls or ceilings until it is nearly bare, or until it can touch adjacent surfaces that can conduct some electrical current.
- d) Pets chewing on appliance cords or extension cords.
- e) Embrittled insulation around fixtures that are not adequately protected from too much heat.
- f) Insulated wires touching sharp metal edges of electrical boxes, rather than being protected by bushings or bushing clamps, or other strain relief devices.

The electrical industry has finally been able to develop "smart" circuit breakers that use small-scale integrated circuit logic to compare the typical load waveforms of arc faults to normal loads that should be expected. When the waveforms look like arc faults, rather than safe loads, the breakers "trip".

Since these devices are still rather expensive and are still in their infancy of development, code authorities are requiring the inclusion only in bedroom receptacle circuits at this time. However, as they become less expensive and more dependable (that is, with fewer "nuisance trip"), they will no doubt be included in more and more of a typical building's branch circuits.

At this time, the AFCI's are made only in a circuit breaker format. However, it's expected that the industry will soon be able to produce them in the small and less expensive duplex electrical receptacle format.

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## Making Incandescent Light Bulbs Last Longer

Have you ever noticed that light bulbs seem to burn out just when you turn them on? That's because their frail filaments are hit hard and suddenly by a large burst of voltage and current every time conventional switches turn them on. Those forces actually cause them to be "jarred" physically. (Sometimes, in a quiet room, you can actually hear the filaments sound like a released spring in response to the sudden energy put to them.)

To reduce the amount of unnecessary stresses that switches can place on light bulb filaments, I suggest considering the incorporation of what some people call "soft switches". These are any number of solid-state dimmer devices that allow the lights to be turned on gradually, instead of simply "slamming" them with the sudden forces that most contacts create. Any dimmer switch that forces the user to move a dial or toggle through a continuously increasing range of voltage or current in order to get the fixture to its fully "on" position each and every time the light is turned on could be considered as a "soft switch". (Any style of rotating-dial dimmer switch with a push-push on/off action, or a slide control in combination with a rocker switch that allows the dimming level to be set, but yet also allows a separate "on/off" action does not qualify as a "soft switch".)

I suggest incorporating soft switches especially wherever expensive light bulbs are used, or where light bulbs are exceedingly difficult to access (such as at high ceilings or over stairways). The use of soft switches can extend bulb life by as much as a factor of 5 or 10.

## Refrigerators and Freezers on GFI-Protected Circuits

Most garages built after 1976 have GFI-protected outlets. Other garages and exterior storage rooms are often subsequently "upgraded" with GFI-type protection. If refrigerators or freezers are plugged into these outlets they can sometimes cause "nuisance" trips of the protective devices. This can lead to food spoilage if the tripped conditions manage to go unnoticed for too long.

I suggest placing refrigerators or freezers in garages (or for other locations that may be protected by GFI-type devices) only upon non-GFI outlets. Usually, a qualified electrician can provide such an outlet in these locations with very little alteration of the existing circuits.

## Loose Door Knobs and Door Pulls

When the surface plates (escutcheons) of doorknobs and closet door pulls are allowed to slide loosely around on finished surfaces, the surfaces are often damaged. Therefore, I suggest keeping all hardware tightly secured to avoid such damage.

## Laundry Valves

Since most washing machine hoses will eventually fail, it is wise to close the supply valves to which they are connected after each appliance use. For many building owners, this would seem to be very inconvenient ... especially if the valves are hard to reach behind the washing machine or require many turns to operate. However, in these cases it would still be appropriate to turn the valves off during long periods of non-use, such as during vacations, etc.

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Alternatively, some modern valve stations are made with simple globe valves that require only one-quarter turn for their full range of motion. Some valves are also available with a single lever to control both hot and cold valves simultaneously. It might be advisable to consider replacing existing valves with these newer types to promote the habit of turning them off between laundry uses.

If easier valves are not a ready option, it may be prudent to employ only the more expensive, steel-reinforced washer hoses to help reduce the chances of flood damage.

## Window Screen Panels Do Not Safely Hold Children

There have been a number of unfortunate accidents through the years involving infants and small children falling through windows that parents thought were safe because of the presence of screen panels. The children would manage to climb onto interior windowsills and lean against screen panels that they naively trusted would hold them. Therefore, I urge all parents of infants and young children to keep the toddlers away from open windows, altogether ... especially windows of upper story rooms.

If windowsills cannot be made inaccessible to youngsters, then it may be wise to either keep sashes secured shut or to open window panels only a few inches for air circulation, when desired.

## Smoke and CO Detector Placement, Testing, and Maintenance

While older buildings may not have been required to have either smoke detectors or carbon monoxide (CO) detectors in place when they were built, we strongly suggest considering the installation of these important life-safety devices in any building. Furthermore, building owners should know that any time a building permit was or is needed to be obtained during any period when the IRC (International Residential Code) has been adopted by the local code authority, smoke detectors and carbon monoxide detectors have been required to be updated to current codes, regardless of the age of the building.

Current codes require smoke detectors in every sleeping area, in every room or hallway that adjoins sleeping areas, at least one at every living level, and at least one for every ceiling level that varies from an adjacent ceiling level by more than 2 feet. Additionally, they should be interconnected in a way such that if one sounds, they all sound. (However, battery-operated smoke detectors that sound independently are acceptable in renovations where major electrical upgrades are not otherwise being made.)

Likewise, current codes require at least one carbon monoxide detector to be placed at each living level in or adjacent to sleeping areas whenever any type of combustion appliance is installed in the building.

I suggest replacing smoke detectors at least every 5 to 7 years, as their sensors will usually begin failing after that period (even though their alarms will continue to sound when their test buttons are pressed).

Smoke detectors may be periodically checked for response to actual smoke by building owners. (Try using a short candle at the bottom of a tall glass jar. The candle will tend to produce a lot of smoke due to lack of oxygen, and the jar will keep hot wax off hands and carpeting. However, if such testing is done too frequently, the smoke may prematurely coat the sensors with a film that could block their sensitivity.)

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## Leaking or Stuck Valves (Service Stops or Main Shutoffs)

If water valves that are not regularly used (such as those for shutting off water supplies to entire buildings or to specific plumbing fixtures), seem “stuck” or “frozen” in a certain position, we recommend exercising extreme care in attempting to force their movement. It’s all too easy to damage such valves or their nearby piping and find yourself with a flood emergency on your hands. Unless the building owner is an experienced plumber, it’s not a good idea to risk causing damage that you have neither the tools, parts, nor experience to repair before the situation gets quickly worse. (We suggest always knowing where the main shut-off valve is located, or how to operate the valve at the water meter before attempting repairs that could possibly cause damage and result in flooding.)

Infrequently used valves can fail to stop water flow when closed after being open for long periods of time. This is sometimes found to be the case with older building shut-off valves that have been in their “open” positions for years. It’s also quite common with valves installed in the cold-water inlet pipes above water heaters. If such valves fail to stop all water when closed, a plumber should be called to replace the valve, as either their stop washers or the valves, themselves, will need to be replaced.

It’s very common for valves to leak a little water past their stem packing or cartridge seals when they get older and/or haven’t been used for some time. This leaking is usually caused by moving a valve that has been stationary for years. However, this unwanted water escape from the valves can usually be stopped by closing the valve immediately. If the leaking valve has a packing nut, we suggest attempting to tighten the nut a little to stop the leak. This can usually be done with a crescent wrench on the packing nut and an opposing wrench on the valve body to avoid transferring damaging forces to nearby piping. (The packing nut is the very first fitting on the valve behind the operating handle that allows the valve stem to pass into the valve body.) By tightening this nut a little, the valve stem packing washer is further compressed into its confined cylindrical space to usually stop the leak by making a tighter seal around the valve stem as it spins in the valve body’s bore where the circular valve stem from the handle must enter. However, if this simple method does not stop the leak, then a plumber must be called to replace either the valve packing or the valve.

Some valves with screw-action stems are designed to stop packing leaks if they are turned fully open, hard against their fully open stop positions. Therefore, if a stop or gate valve leaks a little from its stem packing while being turned open or closed, it’s sometimes possible to stop the leak by simply turning the valve fully open and tight against its internal stops.

Ball valves and globe valves do not have this feature. If they leak from their valve bodies, it’s time for a new valve. (Ball and globe valves are the ones that usually have a bar or lever-shaped handle that moves only through 90 degrees of travel, rather than having circular handles that require many turns to fully operate like gate or stop valves.)

If a building owner is experiencing problems with any types of valves, we are more than willing to receive calls at any hour to try to help them take the most appropriate action, first. Sometimes, we can guide building owners through corrective repairs. Other times we can help building owners choose the best plumbers at the most reasonable rates. Hopefully, we can always help reduce anxiety and educate the customer further in the process.

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## Crawl Space Conditions

The spaces under this building should be kept relatively clean and dry. It's wise to keep all wood or paper debris or personal property removed from the crawl spaces ... especially from resting in direct contact with the soils. (Any type of cellulose-containing material can become an attractor for wood-destroying organisms such as molds, mildews, wood-rot fungus, wood-boring beetles, or termites, etc.)

I suggest inspecting crawl spaces at least twice each year. Someone should at least peer into its access with a flashlight. This will help detect water flooding that might develop due to an unnoticed leak in the supply or drain plumbing. An occasional peek into the crawl space will also let you know how the gutters and downspouts are performing, as well as tip you off to possible exterior grading and drainage problems.

## Mineral Efflorescence on Earthen Floors of Crawl Spaces

Earthen floors in crawl spaces often display white, orange, brown, or yellow growths that are sometimes confused with molds or other types of fungi. If these "growths" are noted only in areas not covered by vapor barrier, they are simply the result of crystalline growths formed by the buildup of minerals that have leached up through the soils in solution with water. As the water evaporates, the minerals are left behind to form crystals. The types of minerals that were brought to the surfaces determine the colors of the crystals. (If these "growths" were fungal in nature, they would be more prevalent under the vapor barriers, as those conditions would be more conducive to fungal growths.) The crystals grow because the water is evaporated away from the surfaces. Wherever the surfaces are covered by vapor barrier sheeting, the moisture cannot evaporate away.

While there is no inherent harm done by the crystals of mineral efflorescence, the process indicates that moisture is slowly migrating from the soils into the air of the crawl spaces. Therefore, it would be prudent to ensure full coverage of the earth with 6-mil plastic vapor barrier sheeting to reduce overall moisture levels under the building. (Elevated moisture levels are conducive to the proliferation of all sorts of pests and wood destroying organisms.)

## Air Conditioning Systems

Air conditioning compressor units (the outdoor portion of the system) should not purposely be run when the outdoor air temperatures are below 45 or 50 degrees Fahrenheit. (The cold oil in their sumps tends to lift up and into the Freon (coolant), leaving none to lubricate the compressor.)

When the outdoor air temperatures are between 50 and 70 degrees Fahrenheit, the compressor can safely be run and some cooling will take place; but this cooling effect is due primarily to the fact that the outdoor air is cooler than the living space air—not due to any change-of-state of the coolant (from liquid to gas).

Air conditioning systems cannot work as designed until the outdoor air temperatures reach at least 70° Fahrenheit. For this reason, annual maintenance should not be scheduled each spring until the outdoor air temperatures will be at least this warm. Heating and cooling maintenance contractors cannot tell whether the coolant charges are correct when outdoor temperatures are below 70 degrees.

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It's also important for the maintenance contractors to verify that the fine air fins of both the outside and inside refrigerant coils (heat exchangers) are free of dust clogging. (An access panel must be available to see the coils at the indoor unit. Sometimes, an access must be cut through the sheetmetal.) Freon (or other coolant types) cannot be correctly adjusted unless the coils are clean.

One should avoid purposely restarting a compressor unit within the first 3 to 5 minutes after it has stopped. (It is more difficult for the compressor motor to restart against a load. Allowing a few minutes for the coolant pressures to equalize helps take the load off the compressor.) During power outages, it's a good idea to quickly turn the thermostat to the "off" position until power is restored and appears to be stable. These precautions can help prolong the life of the compressor motor.

## Air Conditioner Condensate Leaks

When refrigerative-type central air conditioning systems are working in the summer months, the indoor refrigerant coils unavoidably collect moisture from the air in the form of condensate, which gathers into larger and larger droplets of water until it drips off the coils. This water is gathered in trays beneath the coils where it flows by gravity into a condensate drain to carry the water away from the system. The drain piping should be routed either to the exterior or to another suitable drain—not just into a crawl space.

If the intended collection and drain path becomes clogged with the typical dust and lint that also lands on the same refrigerant coils (especially if the furnace filters aren't doing their job), the condensate can build up and overflow the collection trays. This causes water to leak down out of the system in places where it can often cause damage. Therefore, one should periodically check all areas directly beneath the indoor refrigerant coils of the air conditioning system for signs of leaks during the summer months when the air conditioning system is in operation. (Searching for the typical 3/4-inch and 3/8-inch soft copper tubing emerging from one of the metal cabinets at or near the furnace or indoor air handler, where the system blower is usually located can identify the indoor refrigerant coils. The larger of these copper-tubing lines is usually covered with black foam rubber insulation. Both lines are usually found running side-by-side from the indoor coils to the outdoor compressor unit.)

Condensate leaks down into the heat exchangers of combustion furnaces can lead to damaging corrosion that can cause breaches in the heat exchanger walls and threaten to let carbon monoxide from the flames into the living spaces.

Condensate leaks down into the crawl spaces or through the flooring can attract termites or lead to dry rot damage or the development of molds and mildews.

One should look for telltale signs of water trails or rust on metal parts of the furnace or ducting (plenums) under the refrigerant coils, or stains left from water puddles on floors adjacent to the furnace or air handler cabinets. Of course, if actual water is found puddling, then one can know for sure that a condensate leak is occurring.

If any signs of condensate leaks are noted, a qualified heating/cooling contractor should be contacted to make any necessary repairs before other problems develop.

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## Heating System Maintenance

Heating systems (furnaces, air handlers, space heaters, etc. – any heating component other than simple radiant electric heat components) should be cleaned and checked annually. However, it's not important what time of year this maintenance is done. For this reason, it's usually wisest to direct the five minutes or so of annual heating system maintenance to be done at the same time as the annual air conditioning service. This strategy can save building owners the cost of an additional, unnecessary service fee each year.

## HVAC System Filters

The types of filter elements that are only 1 or 2 inches thick (usually of paper, fiber mesh, "hog hair", fiberglass, open-cell foam, etc.) must be washed or replaced as often as monthly to ensure the longest possible system life. These simple and inexpensive furnace filters (such as often purchased in grocery stores) will typically help furnaces and air conditioners last up to 17 to 22 years if very diligently maintained. Whereas, the more expensive and more efficient types (such as 4,5, or 6-inch pleated media filters, electronic filters, and combination filter systems) can help a furnace's heat exchanger last up to 35 or 40 years and an air conditioner's compressor last 20 to 25 years or more.

Usually, custom installed filter racks and appliances containing electronic, electrostatic, or pleated media filters will provide the best results. Therefore, I suggest contacting several local heating and cooling contractors to gain more knowledge about the types available.

Of course, better filtering systems also provide the added benefits of helping keep the living spaces cleaner and reducing symptoms of allergy sufferers. People who suffer from asthma also gain more comfort from better filtering systems.

## Fiberboard Siding

Fiberboard siding should last indefinitely as long as it is kept sealed against water entry. I suggest keeping all nicks and scrapes made by pets, lawn mowers, weed eaters, etc. covered with good quality oil-based primer as soon as they're noticed. (Water-based primers soak into fiberboard materials to cause further disruption while they are drying. Therefore, they cannot provide an adequate seal against further moisture absorption.)

Furthermore, the nails that were used to apply the siding will often let water into the boarding if not properly driven or if not kept sealed. Therefore, I suggest keeping all cracks or openings around nail heads sealed with good quality paintable caulking or with oil-based primer ... or a mixture of the two.

## Repair of Weather-Damaged Fiberboard Siding and Trim

When the interior particles of fiberboard siding and trim have been exposed to the weather and become expanded due to water absorption, special techniques must be used to prevent further degradation and restore appearance. Simple repriming and repainting will often not effectively reseal the larger voids created by the expansion of the factory compressed wood fibers.

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If the amount of expansion damage is severe enough to prevent most paints from “bridging” the gaps between the coarse fibers at the surface, but not severe enough to substantially weaken the fiberboard panels; a method of filling the large pores can be employed to effectively reseal the fiberboard from further damaging water intrusion.

A slurry of oil-based primer and drywall powder can be intermixed to the consistency of butter and applied with a brush to all surfaces that are otherwise too coarsely open to be sealed effectively with primer coatings, alone. Once the drywall powder of the slurry is worked into the open-fiber surfaces as much as possible with the ends of a brush, the primer component of the slurry will be able to form a continuous, smooth film over the surfaces that can dry to become a waterproof filler coating.

(Of course, the water damaged areas of the siding or trim should be dry before the slurry is applied; and any loose material should be first scoured away with a wire brush.)

Once the primer slurry is dried and the fiberboard is effectively sealed, color-matched water-based alkyd or latex top coatings may be applied.

I also suggest the use of polyurethane caulking to seal all small holes where nails have broken the surface, or where one wishes to generally apply caulking beads to make a “tighter” looking appearance to the exterior of the building. Polyurethane caulking cannot usually be found at paint stores because of its expense. It usually costs from \$12 to \$14 per tube to fit into the smaller-sized caulking guns. It’s easier to apply than most other sealants, and has a very slow curing time. It’s also very “paintable”. It’s made by various manufacturers and can usually be found in building supply stores or masonry supply centers. Alternatively, a paintable caulking called “Big Stretch® is available through some paint stores, which is very effective. However, regardless of the caulking used, I suggest covering it with paint after it is applied, in order to extend its life in the sun and weather.

Speaking of painting over caulking: Don’t be tempted to believe that any kind of sealant containing silicone will be “paintable”. Although sealants made with silicone are great, in themselves, they simply don’t allow paint to stick to them—regardless of what their manufacturers may claim.

## **Roof Valleys and Gutters Over Sloped Shingled Roofs.**

Since the roof of this building is prone to collect tree debris, I suggest that the valleys and gutters be cleaned seasonally. If too much tree debris is allowed to stand in the valleys, the shingles may let water through into the attic or living spaces. If the gutters become too full of tree debris, water may leak back under the shingles along the eaves to damage the fascia, soffits, or living spaces.

## **Overhead Garage Door Operator Safety Functions.**

The newer-style multi-sectioned overhead vehicle doors in use at most buildings today have a tendency to develop higher forces close to the bottoms of their travel than the older-style one-piece doors. This is due to a cam-like action that is developed by the drive linkages in the last few inches of downward travel.

In order for drive-force-sensitive stop-and-reverse safety functions to be effective when the bottoms of the garage doors are at the height of a child’s head or chest, they must be set extremely light at the upper extents of their travel.

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This often tends to cause the doors to stop and reverse because of the inherent friction in their tracks and rollers. By the time adjustments are made to allow the doors to travel fully closed without reversing from their own frictional forces, the forces that can occur without tripping the stop-and-reverse safety function in the last 4 inches of their travel can be too great to provide any real protection for children or small animals.

That's probably the main reason the industry has developed the electronic "eye" (or "light beam") sensors that have been included with most installations since 1993. These sensors can augment the relative safety of the traditional drive-force-sensitive functions by causing the drive motors to stop and reverse whenever the light beam is interrupted while the door is traveling downward.

However, I see all too many of these electronic "eyes" being installed at heights much greater than those of a child's head or chest. This could conceivably allow a child or small pet to lay upon the floor beneath the light beam without tripping that function ... leaving only the older-style, relatively insensitive, safety function remaining in effect.

Some people have been tempted to raise the levels of the electronic "eyes" high enough that cars cannot be parked halfway in and out of garages (where the light beams would simply shine under the cars, between their front and rear wheels, for instance). This certainly provides more protection for the cars; but severely reduces the protection for children and small animals. I strongly discourage this practice.

I suggest that any electronic "eyes" installed as safety features on garage door operators be installed at heights no greater than 4 inches above the floor.

I further recommend that the drive-force-sensitive safety features be set to barely allow the doors to drive downward without stopping and reversing upon their own friction. (This adjustment should be checked every month or so, as the settings will tend to "creep".)

As a final word: The only truly safe way to operate automatic garage doors is to watch them travel fully open and closed. Children should not be allowed to operate these appliances without adult supervision.

## **Sprinkler Controller Back-up Batteries.**

Automatic sprinkler controllers designed to hold their customized programs in solid-state memory usually lose their programming whenever the power source to their memory is interrupted. These controllers require the implementation of "back-up" batteries. Although the controllers are not designed to allow actual operation of the sprinkler system during power outages, they can at least save the custom programs stored in their memory and keep track of the correct time and dates during most power outages. (This is a great way to ensure that your custom timing and scheduling has not been interrupted, changed, or forgotten because of a power outage.)

However, to ensure that the backup batteries remain fresh enough to do their job, I suggest replacing them each fall when the sprinkler system is "winterized". (They can be replaced while the main power source is still available to the controller without fear of losing the program.)

It's a good idea to place a chart of any custom program schedules near the controller. It's also a good idea to keep a map of the zones and sprinkler head locations near the controller. The map should also show the locations of all the solenoid control valves, the stop-and-drain valves, and the backflow

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prevention valve. (This information is invaluable to sprinkler contractors, plumbers, lawn maintenance personnel, or even friends who may have to operate the system in your absence.)

## Winterizing Sprinkler Systems.

This climate produces freezing weather as early as mid-November, with frosts typically occurring into early April each year. For this reason, it's best to "winterize" the sprinkler systems each fall to protect them from freeze damage.

This is done by closing the main stop valves and blowing compressed air through each of the zones, in turn, (usually using the automatic controller to sequentially open the zones) until nothing but clear air emerges from the sprinkler heads.

Most systems also have a drain valve located near the stop valve that can help let any trapped water in that section of piping out into the soils through a gravel sump around the valve.

The backflow prevention valve manifolds usually have one or more drain valves located on them, also. It's very important to ensure that all water is purged from all components that are within 3 feet of the ground surfaces.

## Discovering and/or Verifying Water Service Line Leaks

If the sound of flowing or rushing water can be heard through the pipes inside a building, and yet you know that no fixtures are using water, you may have a buried water service line leak. (These sounds transmit themselves rather easily through the piping, even if the leak is occurring beyond the building walls. Of course, other ways to discover water service line leaks are high water bills or constantly cycling pumps in private wells.

If a private well pump can be heard cycling on and off when no water is being used, a leak has developed somewhere. The leak needs to be found and eliminated. The sounds of the pump can usually best be heard near the pressure tank, pressure switch, or the well head.

If the property has a water meter, most meters have a small red triangular indicator on the dial face that spins perceptibly even for the smallest of leaks. It is a good idea to watch the leak indicator triangle periodically on older buildings with any type of direct-buried metal service line piping.

Many water utility companies make special insurance policies available to their customers (through independent vendors) that will cover the costs of buried service line leaks. Usually, these policies are very inexpensive.

## Using Unfinished Attic Spaces for Storage

The open truss or rafter framing found in most unfinished attics will not provide surfaces capable of withstanding loads required for storage activities. The danger is that people might inadvertently step through sheetrock or plaster ceilings, thereby causing property damage or personal injury. I suggest installing solid wood plank flooring or at least ½-inch plywood sheeting to span the framing members before attempting to walk in unfinished attics. Likewise, stored personal items should never be placed so their weight is applied directly to sheetrock or plastered ceiling surfaces. Such loads should always be applied to the framing members. Additionally, it would be wise to have an architect or engineer

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determine the amount of weight that can be safely placed on ceiling framing in any attic. Furthermore, if attic storage space is made over living spaces, care should be taken to avoid degrading the insulation needed for energy efficiency.

## Dealing with “Fogged” Windows

When building inspectors are able to identify even one thermal window that has “fogged”, there are often other windows on the same property that are also showing visible interior condensation from time to time. When this condition first develops, water droplets may be visible at certain times of the day or during certain weather conditions, only. At other times, these same windows may appear completely clean and clear.

It isn't until moisture-laden air (along with dust and other soils carried into the thermal panels with that air) has been entering the window assemblies for a considerable period of time that the characteristic streaks of mineral deposits remain even when no condensate happens to be visible. When these streaks finally become prominent, they begin to interfere with the ability to see clearly through the windows. (They also make the windows look “dirty”.)

While windows in this condition can eventually look pretty bad, their ability to keep out wind and rain is not really hampered. In fact, their ability to continue to provide thermal insulation is not affected all that much. The only slight exception, here, I suppose, is the partial exchange of argon gas found in many higher quality windows, with normal air. (Argon gas conducts less heat than air.)

The “loss of seal” or “seal failure”, as some people are fond of saying, is really only the condition of the desiccant powders placed in the windows' thermal units by their manufacturers having finally absorbed more moisture than they can hold. Many thermal windows are designed to “breathe”. Those typically have tiny capillary tubes installed that are designed to let only small amounts of air in and out of the spaces between the glass to help equalize pressures between the gasses inside the windows and the atmospheric air outside.

Usually, south-facing windows with no tree shade have to “breathe” much more during their daily cycles of strong direct sunlight and cool nights than windows facing in other directions. For this reason, the south-facing windows are often the first to become “fogged”.

However, if a person unwittingly sprays a window that is exposed to direct sunlight on a hot day with cold water to wash it, it's a pretty good bet that the rapid change in temperatures will cause enough sudden contraction to either break the seals along the spacer channels, or the glass, itself.

In fact, just banging on a window or slamming a moveable sash open and closed while a window is stressed from temperature changes could also cause seal failure and result in premature “fogging”.

Unfortunately, the only feasible way to eliminate the undesirable effects of “fogged” windows is to replace the thermal glass units, themselves. Fortunately, though, most factory-framed windows allow these thermal units to be replaced without having to remove the window framing from its building. The process of replacing “fogged” thermal units is usually quite fast and causes very little disruption to the building. However, wood-set windows (where the thermal units are built right into the building, rather than being factory-framed) usually require a little more time and disruption, as casings and/or moldings have to be temporarily removed, replaced, repainted and/or recaulked.

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## Small Shrinkage or Settling Cracks in Sheetrock Surfaces

**New Buildings Under Warranty:** It is completely normal for new buildings to acquire small cracks here and there in sheetrock surfaces due to initial settling and shrinkage. Usually, these cracks will begin appearing within the first few months after the completion of construction; and 90 percent of their total movement will have occurred within the first 3 to 5 years.

If owners of new buildings prefer to have their general contractor take care of these minor cosmetic imperfections during the warranty period (which is usually one year), I suggest simply putting the contractor “on notice” and asking that all cracks be treated at one time near the end of the warranty period.

**Buildings No Longer Under Warranty:** Alternatively, the building owners can usually very satisfactorily fill these cracks with matching painters caulking. The matching caulking should be pressed as deeply as possible into the cracks, but all excess caulking should be immediately wiped from the surrounding surfaces with a damp towel. In this manner, the visibly contrasting black shadows of the cracks are eliminated, making them essentially disappear. (CAUTION: If excess caulking is left on the wall or ceiling surfaces next to the filled cracks, it will be too visible. Even a closely matching caulking color will appear very different if enough surface area is in view. Additionally, it won't reflect light the same as the adjacent paint; and its texture won't be the same, either. The patch would appear “over-worked”.)

## “Nail Pops” or “Nail Bumps” in Sheetrock Surfaces

Sheetrock nails will sometimes appear to be backing out of sheetrock surfaces. When this begins to happen, it looks as though the nail heads are forming “bumps” just under the painted and textured surfaces. However, sometimes, these “bumps” become so pronounced as to actually create splits in the paint. Eventually, the paint and texture can even fall away, leaving the nail heads exposed.

In actuality, however, the nail heads are not moving at all. What is really happening is that the sheetrock is moving closer to the framing, sliding along the nail shanks, causing the nail heads to pop through the surfaces of the texture and paint.

This condition is caused by the drywall contractor's failure to secure the sheetrock panels tightly against the framing with the nails. Therefore, when the building framing moves a little due to expansion and contraction, wind loading, settling, or other forms of typical and normal flexing, these “nail bumps” or “nail pops” can occur and become visible ... sometimes even unsightly.

First of all, though, please rest assured that this is a cosmetic problem, only. And although it would have been nice if the drywall contractors could have secured the sheetrock tighter to the framing, there's usually a pretty easy and completely appropriate “fix”.

I suggest completely removing any such offending nails that are causing the unsightly “bumps” or “pops”, as they are almost always no longer needed in those particular places once everything is taped and textured. (Furthermore, trying to drive them past the surface usually only causes more damage, such as splitting nearby taping joints.)

Once the nails are removed, their holes can be filled, retextured, and repainted at any time without further worry of those places ever appearing less than perfect again in the future ☺.

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## Avoiding Baked-on Food Soils in Oven Door Glass Panels

I often see brown streaks of baked-on food soils deposited on the inner layers of glass-paneled oven doors. Once food soils get inside the oven doors, disassembly of the doors is required to access the surfaces to remove the stains.

To avoid this problem, I suggest being aware that cleaning fluids can easily enter the interior of oven doors through their edge seams and especially through their latch lever holes which are provided for the “self-cleaning” functions. Since the “self-cleaning” processes do not reach any food soils deposited beyond the oven door’s flexible seals, building owners usually need to clean these perimeter surfaces separately with a strong detergent. I encourage the building owners to wring all excess moisture from their cleaning rags before attempting to scrub these surfaces. Any water or detergents that get into the oven door may look clear at first (as they run down the inner glass surfaces), but any organic soils dissolved or suspended in the water will eventually darken and become baked on.

## Soils Settling Next to Foundations

When foundations are made that must extend to frost grade (a minimum of 24 inches in Idaho) beneath most buildings, the earth is excavated beyond the boundaries of the foundations to allow room for the concrete forms. After the forms are removed, the trenches are gently backfilled so as not to threaten the relatively uncured, weak concrete. As a result, most backfill will settle noticeably within the first few feet of any foundation during the first 5 years after construction.

After this initial setting has occurred, building owners may find that the ground surfaces which originally sloped away from their foundations now slope towards them. If this is the case, I strongly recommend periodic inspection of any adjacent below-grade spaces for possible exterior surface water entry. If waters from rains or irrigation begin entering below-grade spaces due to inadequate slope of the soils away from the foundation, then corrections should be made. However, if the settlement occurs adjacent to slab-on-grade floors (such as for most garages and some living spaces), then the importance of correction is less. Nonetheless, it’s never a good idea to allow water to pond against foundations.

If corrections are needed, the loose topsoil, landscaping materials, shrubs, plants, and any sprinkler system components should first be removed to expose the underlying “subgrade” of native earth that was used to originally backfill the footing trenches. Once the underlying soils are exposed, they should be further compacted with vibrating machinery as much as possible.

After that, additional soils with relatively high clay content should be added in 3-inch “lifts” and carefully compacted until the maximum slope away from the foundation can be achieved. It’s wise to use soils less permeable (i.e., with slower percolation rates) than the native soils, if possible. (Note: At least several inches of clearance should be maintained between the bottom edges of siding and the tops of the finish grading.)

Once appropriate new soils are properly placed in the footing trenches to bring them up to adequate slopes away from the building, the sprinkler components, plants, shrubs, lawn, landscaping materials, etc., can be reinstalled.

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## Multi-Level Buildings with Only One Heating/Cooling System

Many buildings with bonus rooms over garages or with second stories or basements have only one forced-air heating system. Those buildings often have difficulty maintaining even, comfortable room temperatures at every living level, simultaneously. This is due to the fact that hot air tends to rise and cold air tends to sink. These buildings can easily experience as much as 10 F° of temperature differential between lower and upper level rooms.

In the summer months, it's relatively harder to get cold air to travel through duct systems into the upper levels of the building. Conversely, in the winter, it's all too easy to get the warm furnace air to the upper rooms—making the upper rooms hotter, for a different reason.

However, it's usually possible to significantly reduce the differences in room temperatures between upper and lower living levels by closing off some of the feed-air registers. (Most feed-air registers have built-in dampers that can be adjusted to regulate the amount of air that can flow through them.)

In the summer it's helpful to close off most of the lower level feed-air registers. This tactic creates greater pressure in the duct system that helps more of the cool air (from the air conditioning system) to be forced out at the upper level rooms.

In the winter it's helpful to close off most of the upper level feed-air registers, instead. This action forces most of the furnace's warm air to be let out into the lower level rooms, first. (Much of that air finds its way to the upper rooms, anyway, without making them seem unbearably hot.)

**CAUTION:** Heating & Air Conditioning contractors may warn against the practice of closing off air flow to any of the rooms ... especially to too many rooms. Therefore, let me instruct the building owner on how to know whether too many feed-air registers have been closed.

In the summer, with the air conditioner running, if too many registers are closed, there's not enough warm room air circulating through the evaporator coils of the system to keep the condensate from freezing. When freezing occurs, the coils may become totally blocked with ice (looking much like the freezer compartment of a non-frost-free refrigerator). If this happens, turn off the air conditioner, but leave the main blower fan running, until you can feel strong air flow, again, at the feed-air registers. After the ice has melted, open a few more of the registers until the system can be run continuously in the "cooling" mode without freezing the coils.

In the winter, it's important to leave enough of the feed-air registers open to allow the main blower to remove sufficient heat from the furnace's flame chamber to keep it from overheating. If overheating of the furnace's heat exchanger occurs, the furnace will automatically turn off the flames until the heat exchanger cools down. Running a furnace against its upper limit safety switch in this manner creates a condition called "short cycling". It's not immediately dangerous (as long as the upper limit switch is functioning); but it's not a good idea, either.

The way to know if the furnace is "short cycling" is to turn the thermostat up to its highest setting while operating in the "heat" mode. As long as the thermostat is calling for heat, the main flames should not need to shut off. Therefore, watch the flames at the furnace for at least 10 minutes after running the thermostat to its highest setting. If the flames shut off during that test period, the furnace is "short cycling". You'll need to open additional feed-air registers.

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Please note that other factors can also lead to iced air conditioner evaporator coils and to short cycling of the furnace. Clogged furnace filters will cause the same unwanted conditions. Therefore, you should be sure to keep the filters free of dust build up that could slow down the needed air flow through the evaporator coils and/or furnace's heat exchanger.

Slow or failing blower motors can also cause the same symptoms. Malfunctioning limit switches or improperly charged refrigerant can also lead to these same symptoms. Therefore, it's best to have the systems checked at least annually by qualified HVAC contractors.

## Foundation Vents (for all but "Conditioned" crawl spaces)

Unless a house is built with "Conditioned" crawl spaces, it's important to keep foundation vents open at least 6 to 9 months during the warmer months of each year to help assure adequate ventilation of the crawl spaces. (Crawl spaces that have a history of high humidity should probably be kept ventilated year round.)

**Vents Operable from the Exterior:** Most of these vents have metal push-pull linkages that protrude through the front faces. These linkages are connected to solid sheetmetal flaps hinged along the top inner sides of the vents. When the linkages are pushed towards the crawl spaces, the metal flaps are opened. Notches along the bottom sides of the linkages can be used to prop the vent flaps open.

To close each vent for winter, simply pull its linkage as far towards the exterior as possible, and then push the linkage downward against the face of the vent to draw the vent flap closed as tightly as possible.

**Vents with Foam Block Inserts:** Some vents have rigid, closed-cell foam blocks that can be stored elsewhere and then inserted from the exterior when the vents need to be sealed for the colder months.

**Vents with exterior flaps:** Some foundation vents have rigid plastic exterior flaps that can be closed or opened.

**Older, Screened Foundation Vents:** Older-style perimeter vents are usually fixed—not operable. They typically have metal mesh screens nailed to wooden frames. I suggest periodic inspection of these vents to ensure that their screening has not become blocked with debris. The proper screen mesh size for this purpose is ¼-inch. Window-screen fabric is too tightly woven and will tend to plug with wind-blown debris and spider webs too quickly. Conversely, mesh sizes larger than ¼-inch will tend to allow too many pests into the crawl spaces.

## Hinge-Mounted Doorstops

I suggest considering the removal of hinge-mounted doorstops, wherever possible. This type of doorstop can apply extreme point loads to door surfaces—all too often punching through the "skins" of hollow-core doors. (However, if this style is the only kind that will work in a given situation, then I suggest applying one to each hinge pin and adjusting them all to share the loads, equally.) Brass self-adhesive plates are also available for door surfaces to spread the point loads over slightly larger areas, or to "patch" door skins that have become damaged by this type of doorstop, rather than needing to replace the whole door because of one small hole.

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Some newer hinge-mounted doorstops have been designed to transfer their point loads back onto the hinge plates, rather than onto weak door skins. However, I find many hinges bent because of these.

Builders are required by code inspectors to apply some sort of doorstop to every door in every building. However, once owners take possession, they should go through the building and immediately decide whether to remove some of the doorstops or replace some of them with different types of doorstops. Commercial-style bumpers can be placed over wall surfaces to avoid (or even cover) damage.

## Various Types of Hose Valves

**Older-Style Non-Freeze-Proof Hose Valves:** Older buildings which have not been fitted with modern freeze-proof sill cocks (typically pre-1950 buildings) usually provide a means of draining all water from their sill cocks (exterior hose valves) during the winter months to prevent freeze damage to the piping. This is done by employment of special “stop-and-drain” valves located somewhere inside the building ... usually in the crawl spaces or in basement ceilings within a few feet of the hose valves.

To “winterize” these older-style hose valves, one would close their associated stop-and-drain valves, and then open the exterior hose valves to let all water drain outside that will drain freely by gravity. To guaranty that all water has drained from the valves and the sections of piping that might be exposed to cold weather, special knurled drain nuts are designed into the sides of the stop-and-drain valve bodies that can let water drain out also through that end of the pipes. Most people simply hang small tin cans or buckets beneath the stop-and-drain valves to catch any small amounts of water that drain from these points.

This process is simply reversed in the spring to reactivate the function of the non-freeze-proof exterior hose valves.

**Freeze-Proof Hose Valves:** This type of sill cock (exterior valves for garden hose) is designed to allow all water to drain from its barrel each time the water is shut off. This allows all water that would otherwise be exposed to freezing air temperatures in the winter to drain away safely before it can freeze and expand to cause damage to the piping inside or behind the wall.

However, in order for this type of hose connection to function correctly, any hoses or other obstructions such as additional valves must be removed during cold weather to allow the valve barrel to freely drain when the valve is shut off. (The valves are designed to be mounted so that their barrels slope towards the exterior enough to effectively drain. If they are incorrectly installed, water can be trapped in their barrels to lead to freeze damage, even if hoses are diligently removed each winter.)

If hoses are inadvertently left attached during freezing weather, one can check for possible freeze damage after the piping is thawed by placing a tight-fitting cap over its hose threads and turning the valve open. If any water sprays or leaks out either to the exterior or into the crawl spaces or wall cavities around the freeze-proof barrel (behind the exterior portion of the valve), the valve must be replaced as soon as possible. (This type of water leak will occur only when the valve is in use and with some back pressure developed.)

**Freeze-Proof Self-Draining Garden Hose Valves:** These valves have an improved design that allows garden hoses to remain attached during the winter without threat of freeze damage to the valves or their adjacent piping. However, in order for the valves to remain protected during the winter months, their valve handles must be turned closed (clockwise) a few more turns than are needed to simply shut

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off the flow of water. When the extra turns are applied, water should be seen falling through a gap created to let water out of their freeze-proof barrels just behind the hose attachment. It is important to apply the extra turns to the valve handles whenever freezing weather might occur before next use of the sill cock.

## Rust Stains on Concrete

Rust stains can usually be totally removed from concrete surfaces, or at least greatly reduced (if not eliminated) by treating them with chemical cleaners designed for that purpose. The most effective product I've seen so far for removing these stains is made by Behr®. It's their "Concrete Etchant and Rust Remover". However, up to a dozen applications with interspersed water rinsing and a lot of scrubbing with a stiff-bristled brush may be required.

**Rust from Irrigation Water:** If water available for irrigation has a lot of iron (ferric ions) dissolved in it or rust (ferric oxide) particles suspended in it, constant watering of adjacent lawn or landscaping areas may result in reddish brown deposits accumulating on the concrete from the nearly unavoidable overspray. Although these stains are difficult to remove, they tend to wear away in time if something can be done to minimize the repetitive wetting of the concrete. Often times, an adjustment of the landscaping and/or sprinkler system will help.

One can install decorative borders adjacent to the concrete flatwork of the driveways, walkways, patios, etc., that don't require watering and which provide enough separation to eliminate most of the occasional overspray.

**Rust from Fertilizer:** Some pelletized fertilizers containing iron will leave small rust-colored stains if not swept off concrete driveways, sidewalks, or patios before the next rain or sprinkler operation. I recommend sweeping or vacuuming all fertilizer pellets off concrete surfaces immediately after application.

**Rust from Leaking Radiators or Battery Acid:** Radiator water or battery acid leaks from vehicles tend to leave rust-colored stains on concrete driveway surfaces. Therefore, automobiles with these problems should not be parked over clean concrete surfaces.

**Rust from Iron or Steel Objects:** Iron or steel patio furniture, plant pots, etc., touching or placed above concrete can be responsible for rust-colored stains if they are not kept adequately coated to prevent oxidation when it rains or automatic sprinklers wet them.

## Floor Coverings in Rooms with Plumbing

Bathrooms and laundry rooms are often subject to inadvertent water spills onto the flooring. Even though most contractors carefully seal the joints between the fronts of tub and/or shower curbs and adjacent floor coverings, water spills can run to the nearby walls. For this reason, I suggest applying matching silicone sealants along the bottoms of all painted wooden baseboard moldings around the entire perimeters of bathroom or laundry-room floors ... especially if the floor coverings have particleboard underlayment beneath them. (Ceramic tiled or stone floors with cementitious underlayments are not nearly as susceptible to this type of damage.)

Without this precaution, water that manages to get to the edges of the floor coverings can be absorbed into their particleboard underlayments to cause swelling and eventual discoloration of vinyl



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flooring or swelling of other flooring materials. Once this happens, the underlayment and the floor covering may both need to be replaced. Therefore, it's much cheaper to protect the underlayment by sealing all possible water entry points.

## Sealing Refrigerator Cubbies Against Water Leaks

Since refrigerators (especially those with icemaker lines) can let water onto flooring, I suggest considering sealing the perimeters of the floor coverings in their cubbies with silicone to prevent water entry into the crevices where the floors meet the walls or adjacent cabinets. This precaution may help prevent unnoticed water leaks from causing long-term damage to subflooring and structures. (I've seen many cases where hardwood flooring has become very warped for 10 feet in both directions from such leaks because water got under it and followed the grooved channels cut into the bottoms of the flooring boards.)

If water leaks are prevented from finding their way down into or past the finished flooring, they will be more likely to advance out onto the floor surfaces in front of the appliance where they will be more readily noticed—before causing greater damage.

Another way to accomplish the same precautionary measure is to place 6-mil plastic sheeting under the appliance. The sheeting can be folded up and against the back of the appliance cubby and along its sides, and held in place with tape. The front edge of the sheeting can be cut to stay just out of view.

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