Home Inspection Report

Inspection Address:
Sample Report, CA

Inspection Date:
00/00/0000

Prepared For:
The Client

Prepared By:
20/20 Home Inspections
319 Balboa Ave.
Davis, CA 95616

866-759-9434 or
530-759-9434
Fax 530-759-9620 Fax

Report Number:
xxxxxxxx-xx

Inspector:
Craig Eden
National Association of
Certified Home Inspectors
Member # NACHI02043001

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Client Advisory

Please note:

This *Advisory* is **not** a "summary" of the inspection report that follows. That is why we urge you to read the *entire* inspection report first.

The *Advisory* is provided as an additional service to our Clients and their Real Estate Professionals and is presented in the form of a listing of the items that, in the professional opinion of your Inspector, merit further attention, investigation, or improvement at this time. Some of these conditions may be of such a nature as to require repair or modification by a skilled craftsman, technician or other specialist. A homeowner such as you can easily handle others.

Often, following the Inspector's advice will result in enhanced safety for the occupants of the home or improved performance and extended life for the component in question. In listing these items, your Inspector is not offering any opinion as to whom, among the parties to your transaction, should take responsibility for addressing any of these concerns.

As with most other facets of your transaction, we recommend consultation with your Real Estate Professional, Attorney or Home Builder for further advice with regards to the items listed to the right.➔

BUILDING EXTERIOR & SITE

1. **Exterior trim at the lower left front corner of the garage door was deteriorated. All deteriorated trim should be carefully examined, then repaired or replaced as necessary to assure continued service. In the future, it should receive regular maintenance.**
2. **The window covers were seriously deteriorated and in need of replacement. The replacement covers should be installed in conformance with standard practice and/or the manufacturer's installation instructions.**
3. **While testing of the yard irrigation system is beyond the scope of a home inspection, leaks were quite evident at several of the sprinkler valves. All leaking, malfunctioning or damaged sprinkler valves in the yard irrigation system should be repaired or replaced to ensure efficient operation of the irrigation system and to minimize wasteful water leakage.**
4. **The garage door had been installed in a substandard manner. A competent garage door technician should examine the garage door and replace all missing hardware, tighten all fasteners and adjust any counterbalance mechanism or completely re-install the door, as appropriate, to restore the door to peak operating condition.**
5. **Voids were evident in the fire resistive barrier between the garage and the interior. We recommend that these voids be patched to restore the required fire separation between the garage and the occupied interior.**
6. **The garage laundry tub was free standing and not secured to either the floor or the wall behind. The laundry tub should be properly supported and secured to restore its full function. Securing should include a rigid fastening to either the floor or the wall behind so that the tub cannot flex the water supply and drain connections.**

ELECTRICAL SYSTEM

7. **Improper wiring methods and techniques were observed in the garage. Improperly installed wiring should be abandoned or removed and replaced with properly installed wiring certified to be safe and dependable by the competent, licensed electrician who performs the work.**
8. **Improper wiring techniques and methods were observed at the exterior rear. Improperly installed wiring should be removed and replaced with new wiring installed in conformance with standard trade practices by a competent, licensed electrician.**

STRUCTURAL SYSTEM

9. **The subfloor under the hallway bathroom was stained with signs of leakage from above. In all areas where the subflooring was damaged or deteriorated, it should be repaired and all damaged material replaced.**
10. **A beam and the subflooring, under the master bathroom, were wet at the time of this inspection. Damage was apparent. The source of the moisture should be found and eliminated and all damaged wood replaced.**

ROOF SYSTEM

11. **The gutter at the left front corner of the garage was damaged. The damaged gutter should be repaired, if feasible, or replaced, if not, with new material installed in strict accordance with the manufacturer's installation instructions and accepted trade practice.**
12. **The metal fasteners used to secure roof flashings were exposed, creating the opportunity for leakage. All fasteners should be sealed, as appropriate, with a high quality caulking material. We recommend the use of urethane sealants, not silicone based materials.**

PLUMBING SYSTEM

13. **The drain line was actively leaking under the master bathroom shower. All drain & waste piping that had been damaged, or which was leaking, should be repaired, or if not feasible, then replaced, by a competent, licensed plumber, utilizing all new materials installed in strict conformance with the latest industry standards.**
14. **One long section of water line, observed in the crawl area, was not supported. This pipe should be strapped to the framing according to accepted standards.**
15. **Portions of the gas piping were corroded and rusted under the master bathroom. A competent, licensed plumber should replace all damaged, deteriorated, corroded or improperly installed gas piping with all new materials installed in a workmanlike manner, in conformance with locally accepted practices.**
16. **A PVC water supply at the exterior left front corner was damaged and in need of repair.**
17. **The installation of the temperature and pressure relief valve for the water heater did not include a discharge pipe. A discharge pipe, conforming to the relief valve manufacturers specifications and local requirements, should be installed so as to exit at an approved location.**

PLUMBING SYSTEM (Continued)

18. The water heater tank lacked seismic restraint. We recommend immediate installation of proper restraint in accordance with current industry standards, local trade practice and applicable jurisdictional requirements.

HEATING SYSTEM

19. The heat exchanger was examined and a crack was discovered. A competent HVAC technician should examine the heat exchanger and confirm our finding. Although it may be possible to replace the heat exchanger, it is usually not cost effective, and parts may be difficult or impossible to find.

COOLING SYSTEM

20. **The difference in temperature between the air entering the return to the system and the air being supplied from it was carefully measured with the system running during the inspection. This temperature differential, or temperature drop, was found to be outside of generally accepted industry standards. This condition could indicate excessive wear in the compressor, low refrigerant level, leaking seals, obstructed air flow across the evaporator coil, or other possible concerns. We recommend further investigation and repair as appropriate by a competent, licensed technician.**

INTERIOR COMPONENTS

21. The mortar in the firebox of the fireplace was soft, and mortar was missing from around the bricks. All loose mortar in the firebox should be removed and new mortar installed. This is known as "tuck pointing."

22. One of the controls for the range was broken or missing. We recommend repair for full use of the range as designed.

23. **A faucet on the kitchen sink leaked at the base, allowing water to drop into the cabinet below. Continued wetting of the cabinet shelf and the contents below will lead to unnecessary expense and damage.**

24. The master bathroom toilet was not securely attached to the soil pipe flange at the floor. A competent, licensed plumber should remove the toilet, inspect the floor for damage, and after repair of any floor damage, reset the toilet, securely to the floor, using a new bowl wax.

Inspection Overview

CLIENT ADVISORY

DESCRIPTIVE INFORMATION

Weather Conditions:	• Overcast Skies
Temperature Range:	• 70 - 80 Degrees F
Orientation of the Dwelling:	• The front entrance faced West
Main Water Shutoff Location:	• On the exterior in the rear
Electrical Panel Location:	• On the exterior on the right side
Main Disconnect Location:	• Inside the main distribution panel
Main Gas Shut-Off Location:	• On the exterior on the left side
Persons in Attendance:	• The client • The client's agent

ADVICE, PRECAUTIONS & CONDITIONS AFFECTING THE SCOPE OF THE INSPECTION

Location/Direction Conventions Used In This Report

Over the years, we have found that our clients appreciate information on the location of thermostats, furnace filters, electrical panels, ground fault circuit interrupt devices, and the main water, electricity and gas shutoffs, especially if they are normally hidden or hard to get to.

Specifying these critical locations becomes even more valuable for those of our clients who are not able to accompany the inspector on the inspection. Not only does this information aid you in operating and maintaining your home, but the abundance of information contained in our Report is reassurance that your inspector did, in fact, crawl into all those nasty places and examine all those "nitty-gritty" details.

Here is how we are going to call out locations and directions in your report:

When we talk about the "right" or "left side" of the house, we are assigning direction as we would if we were standing at the street and were looking towards the front door.

For features inside the home, they will be located by imagining that you are standing in the doorway of the main entrance looking towards the center of the house. Then locations will be described as "left" or "right", and "front" or "rear". (For example, "the left rear corner of the right front bedroom").

The floors or levels are referenced from the level which we enter from the front (main) entrance. The level that you walk in on will be called the "Main Level". If there is a basement, that is usually the level below the Main Level, and the floor above would be called the "Second Floor" or "Upper Level".

Important Information on the Scope of this Inspection

The Yard Sprinkler System Was Not Inspected

The landscape irrigation (sprinkler) system was not inspected and is not included in this report. Thus, we cannot make any representations as to its present condition or future performance. We recommend evaluation by a sprinkler system technician, if further information on the system's function and condition is desired.

Acceptance or use of this Inspection Report shall constitute acceptance of and agreement to all of the provisions of the Property Inspection Contract and its Terms and Conditions which are attached to and form a part of this Inspection Report.

We Evaluate for Function, Operability and Condition

The purpose of a home inspection is to evaluate the home for function, operability and condition of systems and components. Its purpose is not to list or attempt to address cosmetic flaws. It is assumed that the client will be the final judge of aesthetic issues and not the home inspector, as the inspector's tastes and values will always be different from those of the client.

Environmental Issues Are Excluded

Comments on environmental hazards or conditions, including, but not limited to, toxic, reactive, combustible or corrosive contaminants, wildfire, geologic or flood hazards are specifically excluded from this inspection and report.

Not Inspecting for Building Code Violations

The presence or extent of building code violations was not the subject of this inspection, nor was it included in the report. No warranty is offered on the legal use, or uses of the building or property. Information with regard to these issues may be available from the appropriate building and/or zoning agency.

Important Information May be Found in the Public Records

Important information about this property may be a matter of public record. However, search of public records is not within the scope of a home inspection. We recommend review of all appropriate public records by the buyer, or a representative of the buyer, should this information be desired.

A Home Inspection, Not a Pest Inspection

Any observations, which the inspector might make in this report regarding evidence of pests or wood destroying organisms, are not a substitute for inspection by a licensed pest control operator or exterminator. Your inspector may only report on a *portion* of the currently visible conditions and cannot render an opinion regarding their cause or remediation.

We Suggest Review of a Recent Pest Control Inspection Report

We recommend review of a current Pest Control Report for further information concerning pest activity or wood destroying organisms on this property. If such a report is not available, we recommend arranging for a pest control inspection, before close of escrow, to confirm the presence and extent of pest or wood destroying organism activity.

Important Information Concerning Mold and Mildew

We hope that the following facts and considerations regarding mold and mildew, the scope of this home inspection and your family's health will aid in your understanding of this important and timely topic:

- Mold spores are present everywhere in the air, both inside and outside of all buildings, even in the driest of desert climates.

- Mold spores are present on the surfaces and in the cracks and pores of building materials when they are delivered to the site of a new home as it is being built. Thus, every new home begins its "life" amply stocked with mold spores just waiting for the right conditions to begin growing.
- While it is true that molds normally do not grow in the absence of moisture, they can remain dormant for years waiting for the right conditions to spring into life.
- Some molds give off toxic gases as an offensive "weapon". These toxic gases aid them in killing competing molds and expanding their "territory". These toxic gases can also be dangerous to humans.
- Human reaction to, and the possible effects of, exposure to specific molds or mildew can vary widely, *even between members of the same family exposed to the same conditions*.
- Some molds are known toxins, and can be a health hazard, causing reactions in humans ranging from simple allergy symptoms to asthma, watery eyes, sneezing, wheezing, difficulty breathing, sinus congestion, blurry vision, sore throat, dry cough, aches and pains, fever, skin irritation, bleeding of the lungs, headaches, and memory loss.
- Searching for environmental hazards of *any* kind, including molds and/or mildew, is not a part of *any* standard home inspection or report and are specifically excluded from this home inspection. (See your Property Inspection Contract)
- Mold infestations can occur inside wall cavities or in underbuilding or attic spaces where they cannot be seen without the destructive disassembly of the building, an activity specifically prohibited by all nationally recognized Standards of Practice governing the Home Inspection profession. Remember too, that *you*, the Client, would be financially responsible for the repair of any damage resulting from any invasive methods used to find hidden mold growth on your behalf!
- There have been a number of documented cases of significant and harmful mold growths that were totally concealed and which left absolutely *no* visible indications of their presence.
- If, during the inspection, we did come across conditions that, in our opinion, could support or suggest the presence of these organisms, we have made every effort to note them in the report that follows.
- No matter whether or not we have mentioned any visual evidence or even suspicious symptoms in your report, and no matter whether or not you, or any member of your family, have been known to have ever had an adverse reaction to possible mold exposure, or if you are concerned at all about the possible presence of these organisms in this home, then we strongly recommend that you engage the services of a qualified expert that specializes in the identification of these organisms and follow that expert's recommendations.

Structural System

CLIENT ADVISORY

A beam and the subflooring were wet under the master bathroom at the time of this inspection. Damage was apparent. The source of the moisture should be found and eliminated and all damaged wood replaced.

DESCRIPTIVE INFORMATION

Foundation Type:	• Perimeter wall with interior piers
Foundation Material:	• Poured in place concrete
Exterior Wall System:	• Conventionally framed wood stud
Interior Bearing Walls:	• Conventionally framed wood partitions
Roof Structure:	• Conventionally framed joist and rafter
Roof Sheathing:	• Plywood applied over skip sheathing
Crawl Space Access:	• A hatch in the floor of the closet in the master bedroom

OBSERVATIONS & RECOMMENDATIONS

Building Foundation

The foundation and other visible elements of the underbuilding support structure were generally in satisfactory condition for the age of the dwelling. However, we suggest attention to the items noted below.

Piers

Some of the piers had shifted or settled slightly since installation. This was a symptom of expansive soils and, in this case no action was indicated other than attention to any moisture and drainage issues, which may be discussed elsewhere in this report.

Support Posts

The support posts had performed adequately over time and could be expected to continue to do so.

Sill Plate

The sill plate, where visible, was in acceptable condition.

Subflooring

← For important additional information on this item, please be sure to read the Client Advisory in the column to the left.

The subfloor in one area under the kitchen was wet at the time of this inspection. No damage was apparent. However, the source of the moisture should be eliminated before damage develops. We did not that the kitchen sink faucet was leaking into the cabinet below. This most likely is the source of the moisture.

Seismic Considerations

The mudsill is the first (lowest) wood member of the framing that rests directly on the foundation. The mudsill was anchored to the foundation with a significant number of bolts.

Crawl Space Moisture

Evidence of occasional slight ground water entry and periodic accumulation was observed in the crawl space. Small amounts of groundwater entering below grade areas would not be unusual and, in most cases, not a cause for major concern if the crawl space is adequately vented.

Crawl Space Ventilation

Ventilation in the crawl space was inadequate according to current trade practice. While several vents were located at one side or end of the crawl space, no vents could be found on the opposing walls. Thus, little or no passive *cross* ventilation could be achieved. The installation of additional vents should be considered as an optional upgrade.

General Comments About The Underbuilding Crawl Space

The conditions noted are considered significant and may affect the performance of the foundation and/or the support system of this dwelling. There may be other underbuilding crawl space conditions discussed in other sections of this report. An Engineer and/or a licensed General Contractor should be retained to evaluate the dwelling and determine what corrected measures may be necessary.

Wall Framing

Where wall framing was visible, all elements were functioning as intended and in acceptable condition.

Roof Sheathing

The roof sheathing, where visible, was in acceptable condition.

Rafters

The roof structure was constructed in a manner typical of houses of this type and age. Where visible, the rafters, which are the members that support the roof sheathing, were generally in acceptable condition and had performed adequately since their installation.

Collar Ties

The original collar ties, which are structural members connecting opposing rafters in a pair and are significant elements of the roof system, were properly installed and were in acceptable condition.

Purlins

The original purlins, which are the members, perpendicular to the rafters, whose function it is to provide mid-span support, were still in place and had performed adequately. Although the existing configuration may not meet present standards, no action is indicated.

Ceiling Joists

The visible ceiling joists, which are the structural members which support the finished ceiling and often serve as an important component of the roof structure, were generally properly installed and in acceptable condition.

Summary Comments On The Structure

Generally speaking, all the visible structural elements were performing as would be expected for a dwelling of this age and type of construction. However, attention is directed to the items noted elsewhere in this report.

ADVICE, PRECAUTIONS & CONDITIONS AFFECTING THE SCOPE OF THE STRUCTURAL INSPECTION

The Crawl Space Was Entered for Inspection

The crawl space was entered for a closer examination.

Keep Landscape Water Off, and Away from, The Building

Landscape watering should never be set to wet the outer walls of a building, or saturate the soil near a building.

Building Exterior & Site

CLIENT ADVISORY

DESCRIPTIVE INFORMATION

Lot Topography:	• Nearly flat
Lot Topography:	• Nearly flat
Site Gradient:	• Slopes gently from east to west
Driveway Surface:	• Concrete
Walkway Surface:	• Concrete
Patio Surface:	• Concrete
Primary Exterior Cladding:	• Stucco
Secondary Exterior Cladding:	• Shiplap hardboard siding
Number/Type of Garage Door:	• One roll-up "Overhead" type door

OBSERVATIONS & RECOMMENDATIONS

Grading and Drainage

Surface grading was generally effective, but some adjustment of the grading at the foundation, would be beneficial.

Downspouts

The downspouts were properly installed and in acceptable condition, with exceptions noted.

Several of the downspouts were not properly extended. This condition will allow roof water to pool near the foundation that often leads to excess moisture around the foundation or in the basement and/or underbuilding crawl space. The discharge from all downspouts should be routed sufficiently away from the structure (usually at least 6' to 10') to prevent puddling, pooling, and saturation of the soil around the building.

Driveway

The small cracks in the driveway pavement were not significant in terms of the performance of the driveway. The driveway was otherwise in acceptable condition.

Walkway

The walkway was in acceptable condition.

Fences and Gates

The older sections of fencing were deteriorated and their remaining service life was limited. These sections should be repaired soon. Expect the need for replacement in the near future.

Hardboard Siding

The hardboard siding was performing as designed and was in acceptable condition.

Stucco

The stucco exterior was generally in acceptable condition, with no significant cracks. Hairline cracks are typical of this material and no immediate action is necessary to correct them. The small cracks can be scratched open, patched and sealed in the course of routine maintenance.

Vegetation Considerations

The vegetation near the building should be conscientiously and periodically maintained to prevent overgrowth and encroachment onto the structure.

Exterior Trim

The exterior trim was generally in acceptable condition, with exceptions noted.

← For important additional information on this item, please be sure to read the Client Advisory in the column to the left.

Exterior trim at the lower left corner of the garage door was deteriorated. The deteriorated trim should be carefully examined, then repaired or replaced as necessary to assure continued service. In the future, it should receive regular maintenance.

The window covers were seriously deteriorated and in need of replacement. The replacement covers should be installed in conformance with standard practice and/or the manufacturer's installation instructions.

Fascia

The fascia (boards nailed across the ends of the rafters at the eaves) was in acceptable condition.

Eaves and Soffits

The eaves or overhangs are comprised of those portions of the roof that extend beyond the exterior walls. The eaves protect the siding, windows and doors from the deteriorating effects of direct rain or snowfall.

The eaves and overhangs were in acceptable condition.

Exterior Doors

The exterior doors were in acceptable condition.

Exterior Windows

The exterior aspects of the windows were in acceptable condition.

Patio

The patio was in acceptable condition.

Exterior Plumbing

While testing of the yard irrigation system is beyond the scope of a home inspection, leaks were quite evident at several of the sprinkler valves. All leaking, malfunctioning or damaged sprinkler valves in the yard irrigation system should be repaired or replaced.

A PVC water supply at the exterior left front corner was damaged and in need of repair.

← For important additional information on this item, please be sure to read the Client Advisory in the column to the left.

Gas Meter Installation

The condition and placement of the gas meter were acceptable at the time of this inspection.

A meter wrench could not be found in the vicinity of the gas meter as recommended in areas subject to seismic activity. A proper wrench should be chained to the meter to provide a convenient means for shutoff in an emergency. The valve can be turned 90 degrees in either direction to shut the gas supply off.

Gas Piping

The gas piping was in acceptable condition. No evidence of leakage was detected at any of the exposed gas piping. Pressure testing may reveal leaks, but this procedure would be considered beyond the scope of a home inspection.

Electrical Service Drop – The Overhead Electrical Supply

The service drop was in acceptable condition.

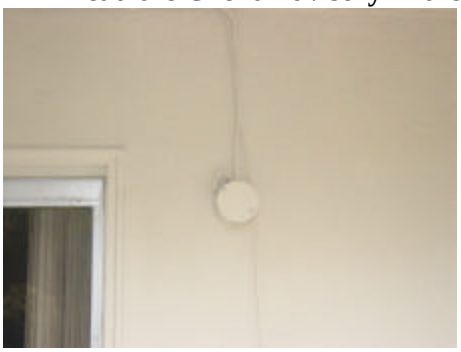
Electric Meter Condition

The electric meter installation was in satisfactory condition. No need for immediate attention was evident.

Electrical Wiring on the Exterior

Improper wiring methods and techniques were observed at the exterior rear. Improperly installed wiring should be abandoned or removed and replaced with properly installed wiring certified to be safe and dependable by the competent, licensed electrician who performs the work.

← For important additional information on this item, please be sure to read the Client Advisory in the column to the left.



Electrical Receptacles on the Exterior

The cover plates were missing from several receptacles on the exterior of the dwelling. This condition could be hazardous, particularly for small children. Appropriate, exterior rated, water-resistant covers should be installed to reduce the chance of moisture penetration and eliminate the safety hazard.

General Comments about the Exterior

The exterior was generally in acceptable condition, but some exterior features were in need of maintenance and repair. These conditions suggest lapses in maintenance rather than negligence or significant structural or systemic deficiencies.

Garage Structure

The garage framing was properly installed and, based on conventional construction standards, was adequate to resist lateral movement. The garage framing can usually serve as an indicator of the type and quality of the framing in general.

Electrical Receptacles in the Garage

All of the receptacles in the garage, which were accessible and which were checked, were properly installed and operational.

Electrical Wiring in the Garage

Unsecured wiring, exposed to damage, was observed in the garage. Loose wiring should be securely attached to reduce the potential for stretching and/or abrasion and to reduce the safety hazard.

Electrical wiring was not properly enclosed and was exposed to potential abuse below seven (7) feet above the floor in the garage. We recommend that a competent, licensed electrician be retained to properly enclose all exposed wiring in conformance with current industry practice.

Improper wiring techniques and methods were observed in the garage. Improperly installed wiring should be removed and replaced with new wiring installed in conformance with standard trade practices by a competent, licensed electrician.

← For important additional information on this item, please be sure to read the Client Advisory in the column to the left.

Examples:




Garage Vehicle Doors

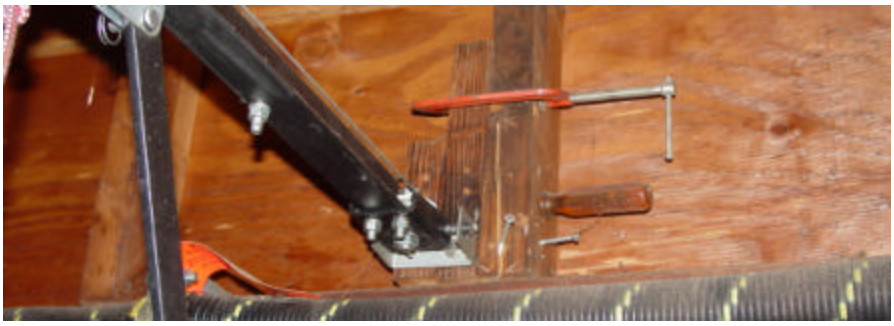
The garage door was operated and was in generally acceptable condition.

Garage Door Openers

The garage door's opener operated properly to raise and lower the door, including the auto-reverse mechanism, which stopped and reversed the direction of the door when striking an object in its path.

The garage door opener had been installed in a substandard manner. A competent garage door technician should examine the garage door opener and re-install the opener as appropriate.

← For important additional information on this item, please be sure to read the Client Advisory in the column to the left.



Personnel Doors serving the Garage

The door between the garage and the living space appeared to be of fire resistive construction, however we could not confirm this conclusively, as no label was evident. It did include an automatic closer. This was a positive feature that provided a greater margin of safety.

Garage Floor

The garage floor was a concrete slab.

Voids were evident in the fire resistive barrier between the garage and the interior. We recommend that these voids be patched to restore the required fire separation between the garage and the occupied interior.

Fire Separation between the House and the Garage

← For important additional information on this item, please be sure to read the Client Advisory in the column to the left.

Garage Ventilation

The ventilation in the garage was adequate.

Garage vents were unscreened, allowing access to animal pests. All garage vents should be properly screened.

Laundry Tub

The laundry tub was free standing and not secured to either the floor or the wall behind. The laundry tub should be properly supported and secured to restore its full function. Securing should include a rigid fastening to either the floor or the wall behind so that the tub cannot flex the water supply and drain connections.

The laundry tub, or sink, was molded polymer or plastic.

← For important additional information on this item, please be sure to read the Client Advisory in the column to the left.

ADVICE, PRECAUTIONS & CONDITIONS AFFECTING THE SCOPE OF THE EXTERIOR INSPECTION

Soil Considerations In Home Construction and Maintenance

While some may have read accounts of spectacular earth movements such as rockslides, earthquakes or landslides, here in our service area the soil behaviors are not nearly as dramatic. However, their potential effect on your house and the concrete flatwork can still be costly and destructive. You may have heard disquieting stories about basement floors which have heaved as a result of accidental saturation of the underlying soils, and a few instances have been reported where excessive settlement or lateral pressures have destroyed the foundation of a home. While one of these extreme situations can be potentially ruinous, the odds of their happening are extremely slim, especially if the informed homeowner will exercise a few common sense precautions.

The good news is that you, as the homeowner, can influence, to a great extent, the behavior of the soils that are present under and around your house. The primary way in which you can influence and control the behavior of these soils is through adequate and aggressive moisture management. In this section, it is our goal to provide you with many suggestions and recommendations that, if conscientiously followed, will help you to stay in control of the soil environment.

After you have read what follows and have studied the environment at your home, you may be tempted to conclude that since you don't see any current signs of water infiltration or slab movement you are safe. Keep in mind, however, that the drainage environment in your yard is ever changing. Gutters can accumulate leaves and debris that clog downspouts, downspout extensions are removed to facilitate lawn mowing – and then are not replaced, swales silt in, underground drainage pipes silt or cave in, and list goes on. To sum all of this up, always monitor the drainage environment around your yard, and conscientiously maintain an efficient flow of water away from the foundation and concrete flatwork.

In most regions of the country, one must consider two distinct soil behaviors – shrinkage and expansion. Each is often described by other names: settlement, consolidation or compaction for shrinkage, and heaving, crowning or up-thrusting for expansion.

Soil Shrinkage:

Soil shrinkage in our area is most often the result of poor quality and/or inappropriate materials in the backfill and/or improper or inadequate compaction of that backfill. To help explain the most frequent causes of soil shrinkage, we should describe in simple terms the evolution of a typical building foundation.

In order to properly construct a foundation in a cold climate, the bottom of the foundation (usually called a "footing" and sometimes called a "grade beam and caisson") must be set well below the outside grade. So that the freezing and thawing of the soil near the foundation will not cause the building to move up and down as the outside temperatures change during the winter.

In order to form and pour the concrete for the foundation footing or grade beam, the ground where the house is being built must be "over excavated". So that the resulting hole will be large enough and deep enough to accommodate not only the foundation but also the workers as they build it. Once the foundation is completed and the formwork has been removed, there remains a sizable cavity between the outside of the foundation and the inside face of the excavation. The practice that has been adopted in recent years has been to backfill the cavity surrounding the foundation with – you guessed it "backfill". Hence, this refilled cavity has become known as the "backfill zone".

More often than not, when it comes time to backfill the foundation of a house under construction, the "backfill" is gleaned from the building site rather than the builder incurring the added expense of importing selected backfill materials from a more appropriate source. Thus, the "backfill materials" often include such inappropriate objects as empty beer or pop cans, lunch sacks, banana or orange peels, wallboard or lumber scraps, sawdust (and other floor sweepings) and abandoned cardboard boxes. Naturally, this motley assortment is often concealed under a nicely groomed cover of "dirt" by the time that you get to see it.

Seldom in residential construction does the builder take the time or have the appropriate equipment readily available to properly and adequately compact the backfill. Their reluctance to adequately consolidate the backfill is further enhanced by the fact that the potential risk of cracking the foundation walls is quite high at this stage of construction. At the time when most foundations are backfilled, they are especially prone to damage for several reasons. First of all, during the initial stages of home construction, the concrete in the foundation walls is still young (called "green" in the trade) and has not yet, attained anywhere near its full strength. Usually, "full" design strength may not develop in the type of ready-mixed concrete typically used in home construction for several years after completion of the house. Second, most foundation walls, on residences with the most commonly encountered wood framed floor diaphragms, must actually function structurally as vertical cantilevers. This means that the next floor system above the basement floor (usually the "first" or main floor) provides little or no lateral support to the top of the foundation wall, leaving it vulnerable to cracking from the excessive pressure which could be applied during the backfill operation. Because of these systemic weaknesses, many residential builders fail to do an adequate job of both backfill material selection and backfill compaction.

Soil Expansion:

After reading the preceding section, it might be hard to imagine how one could experience a situation where the soil could expand. But we encounter symptoms of swelling soils every day.

What conditions could cause the soil to expand? In most areas, the presence of clay minerals in rocks and soils is the leading cause. More specifically, it is the presence of significant deposits of Montmorillonite clay (often called "bentonite") that make themselves apparent by pushing up basement and garage floors as well as patios and front walks. The cause of the expansive movement is the pushing apart of the tiny clay plates by water molecules attracted into the spaces between the plates. In extreme cases, under laboratory conditions, samples of pure Montmorillonite have produced expansions of up to 15 times their original volume!

These swelling soils are likely to be present almost anywhere there are population concentrations. Fortunately, the deposits found around most residential developments may not expand more than 35 to 50 percent. Nevertheless, the pressures and resulting movements of improperly designed building foundations or inadequately drained slabs can be quite damaging and should be addressed with healthy respect accompanied by a liberal application of preventive measures. Once the homebuyer has learned that there is a high probability that at least some swelling soil may be present under or around their home, the next logical step is for the informed purchaser to be aware of the types of preventive measures. These measures can and should be taken to minimize the possibility for soil movement and the attendant damage to the structure and/or flat work.

In summary, the combination of likely geology and prevalent building practices makes it highly probable that vertical soil movement can and will occur around your home. The fact that this potential exists, however, is not a valid reason to avoid purchasing the house. It is, though, reason enough for the conscientious homeowner to learn all that they can about these movements and to take all appropriate and prudent preventive measures.

Recommended Measures For Minimizing Soil Movement in the Residential Setting

There are many measures that a conscientious and informed homeowner can employ to constructively influence the behavior of the soils under and around their home. Some of these measures can only be done before and during the initial construction of the home – and, thus, are out of the reach of the purchaser of an existing home, but others are appropriate and beneficial at any time during the life of the house.

Post Construction – Preventive & Control Measures appropriate for Completed Homes

Because the majority of our services are provided for completed homes, the information presented in this section will most likely be the most useful and appropriate for the vast majority of our clients. We cannot over emphasize the importance of implementing all appropriate post-construction measures to control soil moisture under and around all homes. Regardless of how well the home and its foundation have been designed and built, if the homeowner does not implement adequate measures to control subsoil moisture, serious and irreversible damage can occur! Proper soil moisture management is accomplished when adequate attention is devoted to collection and disposal of water falling off the roof and water falling on the ground around the house.

Often, homeowners are not aware of the significant contribution made by the roof to the overall drainage load on their lot. After all, most of us think of the roof for its primary function of keeping water from entering the home from above. However, particularly in developments where lot sizes are limited, the area of the roof may be larger than the ground level area of the lot! On sites such as these, it suddenly becomes apparent that adequate control off water from the roof will be imperative if the structure and flatwork are to be protected from damage due to water-induced soil movement.

An effective system for roof water management will, logically, start at the edge of the roof with a properly designed and installed system of gutters to collect the water as it runs off the roof covering. Allowing water to drip directly off of a roof without benefit of a roof-level collection system is, more often than not, a sure recipe for moisture in the basement or under building crawl space below! Once an adequate and effective collection system is in place, the next most important component is an adequate number of functioning downspouts to conduct the collected water to the ground for proper disposal. Downspouts are not only required components for gutter systems, but they also are essential for properly draining scuppers that are used to discharge water from flat roofs. Finally, downspouts are not complete until and unless there is adequate provision at there lower end to conduct the roof water well away from the side of the house. Directions for properly extending downspouts are quoted: "The discharge from every downspout must be adequately carried to a point at least five feet (5") away from the building foundation and be discharged where it will not flow back towards the building. Extensions may be made from lengths of downspout pipe. "U-shaped" sheet metal troughs or concrete or plastic "aprons" (often called "splash blocks"), but any of these devices must extend at least five feet out from the wall of the building! Also, lengths of 4" diameter corrugated flexible vinyl or 4" PVC pipe may be buried to pass water under sidewalks and/or gardens where necessary.

As a rule of thumb, the surface of the ground should slope down as one moves away from the house. This pattern of drainage away from the house should be maintained all around the entire perimeter of the house with special attention paid to any sides of the house where the original grade sloped up hill as you move away from the house. On the side(s) of the house where the original grade rises up from the wall of the house, constructive use should be made of swales. A swale is a valley with shallow sloping sides, which runs parallel to the wall of the house. A swale is positioned so as to intercept any water which may tend to flow toward the house and conduct it around (parallel to) the house to a point where it can be discharge to flow out of the yard and not back up against the house.

The paragraph below is taken directly from the advice commonly furnished by Consulting Engineers: "insure that all surface water is directed away from the foundation. The recommended rate of slope, or fall, away from the building is at least one inch (1") of fall for every foot of distance away from the building foundation for a distance of at least ten feet (10'). In addition, no ponding should be allowed to occur within ten feet of the foundation."

We should emphasize that, while management of the moisture which Mother Nature drops upon your house and lot is certainly quite important, there is an additional aspect in the overall picture that is also of great importance. This particular aspect involves landscaping design and the layout of any irrigation systems that may be in the yard in the vicinity of the house. Once the homeowner has taken all of the steps to collect and divert roof water and snow melt away from the house and the foundation, it would be foolish and even remiss on his part to overlook the possible contribution of his/her own man-made sprinkler system (or garden hose). Let us assure you that we have personally witnessed more than one instance of near spectacular heaving of basement slabs caused by excessive water "introduced" next to the foundation. In one such memorable experience, a homeowner set a garden hose and then forgot it and left it running for several days. Saturation of the underlying soil heaved the basement floor in excess of three inches along one entire side of the house. Another "classic" case occurred when the supply piping to a sprinkler system developed a small, but continuous, leak which went undetected for several weeks until the floor in the adjacent part of the basement "popped" up several inches necessitating its complete removal and replacement!

Most experts on expansive soil conditions strongly recommend avoiding the placement of plants or other landscaping features, which require significant quantities of water to sustain healthy growth, within five (5) feet of the foundation. In addition, they also recommend avoiding the placement of any sprinkler heads in positions such that they might spray on areas within five (5) feet of the foundation.

To Sum It All Up . . . . .

By now, we hope that we have done an adequate job of describing not only the adverse behaviors of some soils but also the causes of these behaviors, so that our clients might be better educated and equipped to implement preventive measures wherever appropriate. If, through expanded knowledge, you are motivated to address the challenges of home ownership with aggressive determination, then we have accomplished much in our never-ending quest to better equip and serve our clients.

In summary, the "ideal" home will comply with all applicable features from the following checklist:

1 The home will have a properly designed and installed foundation drainage system.

2 Adequate subgrade drainage will be provided for all areas under concrete flatwork (slabs).

3 All backfill will have been carefully selected and adequately compacted.

4 The finished grade will be contoured such that all water will be directed well away from the foundation and all around the house.

5 The roof will be surrounded by a well designed and competently installed system to properly handle roof water and discharging it well away from the building foundation.

6 No landscaping plantings which require frequent irrigation will be found within five (5) feet of the foundation and no sprinkler system components will discharge water within five (5) feet of the foundation.

Remember that when it comes to your home, "High and Dry," should be your goal.

Sprinkler System Was Not Inspected

Operation and evaluation of irrigation (sprinkler) systems are outside of the scope of a home inspection. In cold climates, the winterization of sprinkler systems also precludes their inspection. For these reasons, this system was not inspected. We recommend consultation with the present owners, occupants or caretaker regarding the layout, maintenance and operation of the sprinkler system.

Keeping Hardboard Siding Dry

Although it is attractive and often very durable, hardboard siding is particularly sensitive to the effects of moisture and is easily chipped. Installation, maintenance and repair of hardboard siding should always be done in a manner which exactly conforms to the manufacturer's specifications.

Hardboard siding is a popular material because of its dimensional stability, lack of knots, etc. One weakness of this material is its tendency to swell and/or deteriorate if moisture is allowed to penetrate it. We recommend regular inspection, caulking and painting to extend the useful life of this siding.

Inspect Stucco Below Grade Periodically

Stucco extended over the foundations below the finished grade. This configuration was accepted practice when installed, but has proved to promote infestation by wood destroying organisms. We recommend periodic inspections for wood destroying organisms.

Upgrading Exterior Hose Bibbs

Backflow prevention devices are now required on exterior hose bibbs to help prevent contamination of the domestic water supply. These devices are inexpensive and available at most hardware stores. Upgrading the hose bibbs should be considered.

Roof System

CLIENT ADVISORY

DESCRIPTIVE INFORMATION

Roof Coverage Area:	• The entire dwelling
Slope, or Pitch, of the Roof:	• Medium
Roof Covering Material:	• Asphalt-Composition shingles
Number of Layers:	• One
Penetrations Sealed With:	• Sheet metal
Roof Drainage System:	• Gutters and downspouts
Method of Inspection:	• Inspected from the roof surface – the inspector walked upon the roof and examined it from above

OBSERVATIONS & RECOMMENDATIONS

Composition Shingles

Features were observed on this roof that indicated that a non-professional did the installation. Although not installed strictly according to accepted standards, it was the inspector's opinion that the roof was in acceptable condition.

Flashings

The metal fasteners used to secure some of the roof flashings were exposed, creating the opportunity for leakage. All fasteners should be sealed, as appropriate, with a high quality caulking material. We recommend the use of urethane sealants, not silicone based materials.

← For important additional information on this item, please be sure to read the Client Advisory in the column to the left.

Valley Flashings

Several of the valley flashings were installed in a substandard manner, creating the opportunity for moisture penetration. We recommend monitoring these areas for future leaks.

Gutters

Roof runoff water was collected and channeled to the downspouts by a metal gutter system that was attached to the fascia boards on the ends of the rafters, along the edge of the roof.

← For important additional information on this item, please be sure to read the Client Advisory in the column to the left.

The gutter at left front corner of the garage was damaged. The damaged gutter should be repaired, if feasible, or replaced, if not, with new material installed in strict accordance with the manufacturer's installation instructions and accepted trade practice.

Chimneys

No spark arrestor or rain cap had been installed above the flue to prevent the escape of hot embers or rain entry. As an upgrade, a chimney cap/spark arrestor could be installed.

Attic Access Entry Information

The attic was accessible through a hatch in the ceiling of the garage.

Attic Ventilation

The space between the ceilings and the roof was adequately vented.

A thermostatically controlled automatic fan was installed in the attic. This fan should automatically activate when the attic temperature reaches a pre-set level and then shut off when the temperature has been reduced by about fifteen degrees. This fan was not operational at the time of the inspection, but this may have been due to the relatively cool attic temperature. We recommend observation of the operation of the attic fan during warm weather to confirm its operation and effectiveness.

ADVICE, PRECAUTIONS & CONDITIONS AFFECTING THE SCOPE OF THE ROOF SYSTEM INSPECTION

We Cannot Guaranty a Leak-free Roof

Our comments do not constitute a warranty that the roof is free of leaks, or will remain free of leaks.

The Benefits of Cleaning the Gutters Regularly

All gutter systems should be monitored on a regular basis and be cleaned out whenever debris has accumulated. Regular and conscientious cleaning will prevent clogging of the downspouts and potentially damaging overflow.

Ventilation is Important

Attic ventilation is extremely important to the general "health" of a dwelling and can be provided by eave/soffit, gable or ridge vents. Thermostatically controlled fans and wind driven turbines are sometimes used to augment passive ventilation.

Attic Ventilation Guidelines

While no absolute formula exists for determining attic ventilation requirements under all circumstances, experts generally agree that attic ventilation should remove excess heat and moisture from an attic space. This should be accomplished without the need of any moving elements, such as fans or turbines and should be roughly equivalent to 1.5 square inches of free vent area (about half the area of screened or louvered vents) for every square foot of attic floor. Total ventilation should be divided almost equally between gable or ridge vents and soffit or eave vents. Screening in vents should be 1/8" x 1/8" hardware cloth, rather than window screening.

Plumbing System

CLIENT ADVISORY

One long section of water line was observed in crawl area that was not supported. This pipe should be strapped to the framing according to accepted standards.

The drain line was actively leaking under the master bathroom shower. All drain & waste piping that had been damaged, or which was leaking, should be repaired, or if not feasible, then replaced, by a competent, licensed plumber, utilizing all new materials installed in strict conformance with the latest industry standards.

Portions of the gas piping were corroded and rusted under the master bathroom. A competent, licensed plumber should replace all damaged, deteriorated, corroded or improperly installed gas piping with all new materials installed in a workmanlike manner, in conformance with locally accepted practices.

DESCRIPTIVE INFORMATION

Domestic Water Source: • Municipal/Community supply
Main Supply Line Material: • Copper, where visible
Supply Piping Material: • Copper, where visible
Water Pressure: • At the mid-range of normal
Waste Disposal: • Municipal/Community collection system
D,W,V Pipe Material: • Cast iron

OBSERVATIONS & RECOMMENDATIONS

Water Shut Off Condition

The main shut-off valve was partially buried. The valve should be fully exposed for ease of operation. This would be especially important in an emergency.

Main Water Supply Piping

No surface corrosion or leakage was visible at the exposed and accessible portions of the main water supply piping.

← **For important additional information on this item, please be sure to read the Client Advisory in the column to the left.**

Water Pressure

Functional flow of water at the fixtures on the highest level was judged to be adequate. Several fixtures were operated simultaneously. Minor changes in flow, when other fixtures are turned on or turned off, is considered normal.

Drain & Waste Lines

← **For important additional information on this item, please be sure to read the Client Advisory in the column to the left.**

Surface deterioration was observed on the exposed and accessible drain & waste lines. These lines should be monitored for signs of leakage and repaired or replaced when necessary.

Vent Lines

The visible portions of the vent piping for the dwelling were in acceptable condition.

Gas Piping

← **For important additional information on this item, please be sure to read the Client Advisory in the column to the left.**

General Comments About The Plumbing System

All functional plumbing fixtures were operated at one time or another during the inspection, and reasonable flow from the supply was confirmed when other fixtures were operated simultaneously.

The drains from all functional fixtures were tested at one time or another during this inspection, and each emptied in a reasonable amount of time and did not overflow when other fixtures were drained simultaneously.

ADVICE, PRECAUTIONS & CONDITIONS AFFECTING THE SCOPE OF THE PLUMBING INSPECTION

The Main Water Supply Piping Was Not Accessible

The main supply piping was inaccessible and was not inspected.

Copper Water Lines

The supply piping in this dwelling was copper. Copper is generally considered a very desirable type of piping and could be expected to last the lifetime of the building.

Periodic Maintenance ("Snaking") of the Sewer Lateral May be Necessary

A home inspection cannot accurately simulate "normal" use of the fixtures, and in a home of this age, drains may become restricted by tree roots during even normal operation. In addition, the lifestyle of the occupants will determine to a large degree how often drain maintenance may be needed. In other words, periodic "snaking" or other repairs may be necessary, and the conditions leading to this may go undetected during our inspection. We recommend referring to the Seller's disclosure statements for information on past performance and any maintenance history which it might contain.

A Sewer Lateral Test Was Not Included

A sewer lateral test is not within the scope of a Home Inspection. Neither is investigation of private water supply systems or private waste water systems. Inspection and testing of sewer laterals, private water supply systems, and private sewage disposal systems requires the services of competent, licensed specialists.

Water Heater

DESCRIPTIVE INFORMATION

Water Heater Location:	• In the garage
Energy Source:	• Electricity
Storage Capacity:	• 30 Gallons
Water Heater Age:	• Newly installed
Water Heater Configuration:	• Free standing tank
Vessel Insulation:	• Manufactured with insulation

OBSERVATIONS & RECOMMENDATIONS

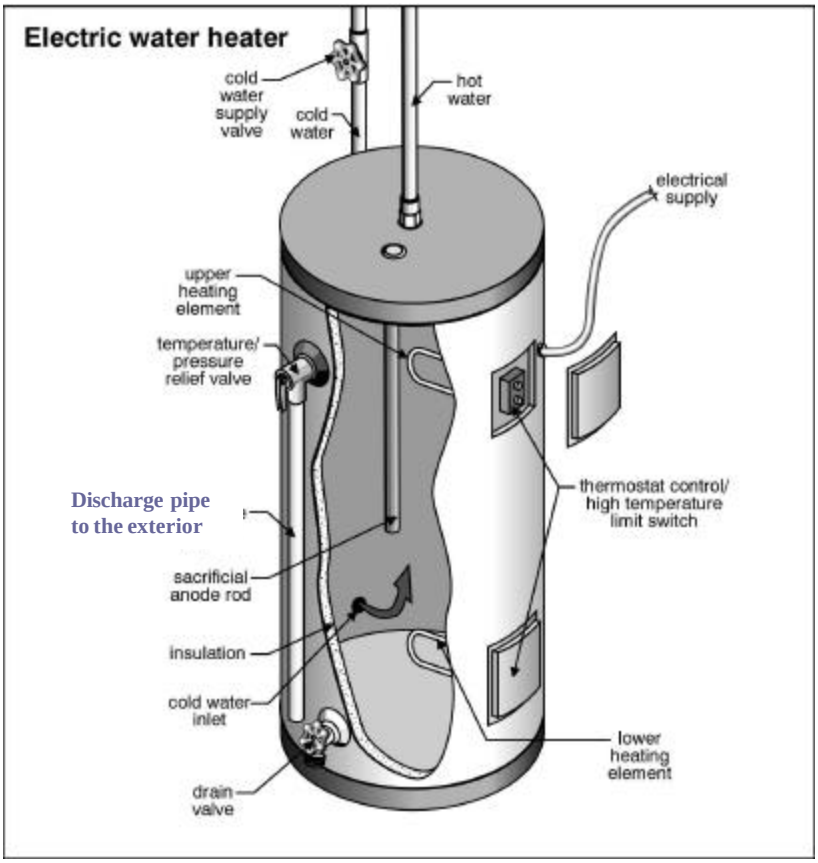
The installation of the temperature and pressure relief valve for the water heater did not include a discharge pipe. A discharge pipe, conforming to the relief valve manufacturers specifications and local requirements, should be installed so as to exit at an approved location.

Water Connections

The cold water inlet and hot water outlet connections were properly installed and in acceptable condition.

Temperature and Pressure Relief Valve

← For important additional information on this item, please be sure to read the Client Advisory in the column to the left.



The water heater tank lacked seismic restraint. We recommend immediate installation of proper restraint in accordance with current industry standards, local trade practice and applicable jurisdictional requirements.

Water Heater Electrical

The access covers for the electric water heater elements were removed from the jacket for closer inspection of the visible areas around the ends of the elements. No leakage or corrosion was evident at the elements. No electrical deficiencies were observed, and the elements were functioning.

Seismic Restraint For The Water Heater

← For important additional information on this item, please be sure to read the Client Advisory in the column to the left.

ADVICE, PRECAUTIONS & CONDITIONS AFFECTING THE SCOPE OF THE WATER HEATER INSPECTION

Why is a Discharge Pipe Required on Every T & P Relief Valve?

The function of the T & P Relief valve, which is required on every water heater, is to allow excessive pressure to safely escape the tank without causing damage to the vessel or the surroundings. Excessive pressure can be caused by a variety of conditions, including too high an internal temperature, which could even cause the water to flash to steam. In any case, when the valve discharges (as is its intended function), it will spray very hot water or even steam from its exit opening. If no discharge pipe has been installed to safely conduct this scalding water (or steam) to the floor, or to the exterior of the building, nearby persons could be seriously burned.

No Protective Barrier In Garage

The location of the water heater in the garage made it vulnerable to damage by impact from vehicles. We recommend installation of adequate protective barriers to prevent damage from misguided vehicles.

Newer Water Heaters Don't Need Blankets

No insulation blanket was installed, however, newer water heaters have built-in insulation to meet rigorous conservation standards. Installation of a blanket can be done but offers very little improvement on the existing efficiency of the unit.

Water Heater Had Limited Capacity

In our opinion, the existing water heater provided a limited supply for a dwelling of this size. When replacement becomes necessary, installing a unit of greater capacity should be considered.

Interior of Electric Heater Was Not Inspected

The electric water heater does not lend itself to internal inspection and thus, it is not practical to estimate its life expectancy. When a representative number of fixtures were operated, we observed an adequate flow of hot water.

Electrical System

CLIENT ADVISORY

DESCRIPTIVE INFORMATION

Service Entry Type:	• Overhead drop
Electric Meter Location:	• On the right side of the dwelling, when facing it from the street
Service Voltage Supplied:	• 120-240
System Grounding Source:	• Driven rod at the exterior, near the electric meter
Circuit Protection:	• Circuit breakers
Conductor Material:	• Copper, exclusively
Wiring Type:	• Non-metallic sheathed cable (“Romex”)

OBSERVATIONS & RECOMMENDATIONS

Electrical Service Drop – The Overhead Electrical Supply

The service drop was in acceptable condition.

Electric Meter Condition

The electric meter installation was in satisfactory condition. No need for immediate attention was evident.

Electrical Service Capacity – How Much Power Can We Draw?

The service capacity was normal for a dwelling of this size and age, and was adequate for the existing demand and small additional loads.

The Main Disconnect

The function of the main disconnect was provided by a two-pole circuit breaker mounted in the main distribution panel. The breaker appeared to be in good condition, although it was not tested during this inspection.

The Main Distribution Panel

The main distribution panel was in acceptable condition with circuitry installed and protected correctly.

Service Grounding

The system and equipment grounding were acceptable.

Branch Circuitry

Improper wiring methods were employed at a few locations within the electrical system. The wiring should be examined by a competent, licensed electrician and modified, or removed and replaced as necessary to ensure that the system conforms to standard trade practices and is safe and dependable.

Electrical Conductor Material – The “Wire”

The conductor material in accessible branch circuit wiring was all copper.

Receptacles; Overall

Ungrounded three-prong receptacles were observed in several areas. This can be a safety hazard. Ungrounded three-pronged receptacles should be grounded, restored to their original two prong configuration or upgraded with GFCI protection to reduce this risk. This work should be performed by a competent, licensed electrician and certified to be safe and dependable when completed.

Switches; Overall

A representative number of switches were operated and several were worn and less than dependable. For maximum safety and dependability, replacement of the worn switches is recommended.

A switch was broken, or was otherwise not functional. The switch should be replaced with a new switch, appropriate for the application and properly wired, by a competent, licensed electrician

Lights: Overall

The light fixtures in this dwelling were generally operational and in acceptable condition.

Ground Fault Circuit Protection

No GFCI (Ground Fault circuit Interrupter) protection was installed.

Smoke Detectors

Smoke detectors were not located inside some of the bedrooms as required by current industry standards. We recommend installation of smoke detectors in all sleeping rooms, prior to your assuming possession of this home.

General Comments On The Electrical System

Multiple significant potential hazards in the electrical system were discovered during the course of this inspection. The deficiencies listed above may not be a complete list. Other deficiencies may be discovered upon closer examination of the system.

Numerous instances of non-professional work were observed, making non-visible elements suspect. A competent, licensed electrician should examine the entire system and repair, augment or modify it to insure that it is safe and dependable.

ADVICE, PRECAUTIONS & CONDITIONS AFFECTING THE SCOPE OF THE ELECTRICAL INSPECTION

A Word About Voltage Terms

We use the terms, "120 volts" and "240 volts" throughout the inspection report, as this is the nominal value of the designated voltage class in all nationally recognized standards for both residential and commercial construction. The actual voltage at which circuits operate can vary from the nominal within a range that permits satisfactory operation of the equipment, again, as defined in nationally recognized standards. This range includes 110 volts and 220 volts, the term you may be most familiar with. In fact, we are both speaking of the same voltage levels and not of a different type of class.

GFCI Protection Explained

GFCI (ground fault circuit interrupter) protection is a modern safety feature designed to help prevent shock hazards. GFCI breakers and receptacles function to de-energize a circuit or a portion of a circuit when a hazardous condition exists. GFCI protection is inexpensive and can provide a substantially increased margin of safety.

A History of GFCI Protection

GFCI (ground fault circuit interrupter) protection was first required by national industry standards for receptacles in bathrooms and in exterior locations in 1971. Coverage was extended to garages in 1975, and to kitchen receptacles within six feet of the sink in 1984. In 1987, basements were added to the list, followed by underbuilding crawl spaces in 1990. Wet bars were then added in 1993. Finally, *all* receptacles above *all* kitchen counters were added in 1997. Local jurisdictions may, however, delay in their adoption of national standards by several years.

Install Ground Fault Circuit Protection

We recommend upgrading the level of protection in the electrical system by installing GFCI receptacles in all locations required by present standards. These locations include receptacles near sink basins, in bathrooms, kitchen counters, garages, basements, crawl spaces, and on the exterior.

Heating System

CLIENT ADVISORY

The heat exchanger was examined and a crack was discovered. A competent HVAC technician should examine the heat exchanger and confirm our finding. Although it may be possible to replace the heat exchanger, it is usually not cost effective, and parts may be difficult or impossible to find.

DESCRIPTIVE INFORMATION

Heat Plant Location: • In a closet off the hallway
Heating Fuel: • Natural Gas
BTU Input Rating: • 100,000
Heating Plant Age: • Age from Data Plate 32 years
The Air Filter Type: • Washable media
Floor Insulation Type/R-Value: • 6" Fiberglass, R-19

OBSERVATIONS & RECOMMENDATIONS

Forced Hot Air Heating System

Forced air furnaces operate by heating a stream of air moved by a blower through a system of ducts. Important elements of the system include the heat exchanger, exhaust venting, blower, controls, and ducting.

← For important additional information on this item, please be sure to read the Client Advisory in the column to the left.

Fuel Supply

The gas supply piping installation included a 90-degree shutoff valve in the vicinity of the heating plant for service personnel and emergency use. The valve was not operated, but this age and style of valve is normally found to be operable by hand and generally trouble free.

The flexible gas connector that supplied this heating unit passed through a hole in the metal cabinet. This is not a generally accepted configuration, as the metal of the cabinet could cut the section of the connector passing through the hole, should the connector be bumped or jostled. As an upgrade, at the next regular servicing, we recommend extending the supply piping with additional rigid pipe, approved for the purpose, from the appliance inside the cabinet out through the hole, so that the connector can remain *entirely* on the outside of the cabinet. A competent, licensed plumber or heating technician should do the work, in accordance with accepted trade practices.

Combustion Air

The supply of combustion air for this heating unit was marginal. For an increased marginal of safety, additional combustion air should be provided. Present combustion air requirements can be obtained from a qualified heating contractor.

Ignition and Controls

The standing pilot was controlled by a thermocouple, which ensures that the pilot gas valve will close if the pilot light is extinguished. This system was in acceptable condition.

The burners were inspected and found to be clean and in good working order.

Exhaust Venting System

The visible sections of the heating plant's venting system were functional and were in acceptable condition.

Distribution System

The filter had accumulated debris that decreased its effectiveness and blocked airflow. This condition can dramatically decrease the efficiency of the system, decrease the service life of the furnace and increase maintenance costs. If the filter can be thoroughly cleaned, then it can be reused, in which case, it should be cleaned and reinstalled. If it cannot be satisfactorily cleaned, then a properly sized new replacement air filter should be installed and secured in the correct orientation in this unit.

System Controls

Operation of the user controls on the thermostat caused the unit to respond.

General Comments About The Heating System

For attention to the items noted, a competent, licensed Heating, Ventilating and Air Conditioning contractor or service company should be contacted for further evaluation and/or cost estimates for the adjustments, modifications, repairs or replacements recommended in this report.

Attic Insulation Conditions

Several gaps were evident in the insulation in the attic. We recommend re-distributing the existing insulation to restore a uniform covering in all areas.

Floor Insulation Conditions

Insulation had not been installed beneath the floors, which is a common finding in older homes. While optional, upgrading by installing insulation under the floors would reduce cold air infiltration and make the home more comfortable as well as reducing energy bills.

ADVICE, PRECAUTIONS & CONDITIONS AFFECTING THE SCOPE OF THE HEATING SYSTEM INSPECTION

Furnace Construction Limits Our Inspection

The nature and configuration of most furnaces, and particularly their heat exchangers, prevents visual access to many critical interior surfaces. In addition, in most jurisdictions, the law does not allow a home inspector to disassemble a furnace beyond those panels that can be removed by a homeowner. Thus, any observations available to a home inspector will necessarily be limited.

General Information On Warm Air Furnaces

The life expectancy of warm air furnaces can vary in the extreme. Both environmental and operational factors can affect their lifespan. Often we are asked, "When is the best time to replace a furnace?" Generally, warm air furnaces are operational until the heat exchanger develops either a hole or a crack. In most building department jurisdictions, once a heat exchanger has developed either a hole or a crack, it must be replaced. Since most furnaces are relatively old by the time that their exchangers develop such breaches, this requirement usually translates into replacement of the entire furnace, since, by that time, a heat exchanger alone is not available.

The Heat Exchanger is the Heart of the Furnace

The heat exchanger is the central component in a warm air furnace. The heat exchanger is a metal chamber or series of metal chambers that form an airtight vessel that separates the burner(s) on the combustion side from the warm (house heating) air on the other (air) side. Once the heat exchanger develops an opening of any type, combustion products may be allowed to migrate from the burner chamber(s) into the air side of the heat exchanger where they can be circulated into the living spaces of the house. There always is a possibility that these combustion products could contain carbon monoxide gas, which, in any significant quantity, can be deadly.

Thus, it is easy to see why any type of crack or hole in the heat exchanger should be cause for immediate replacement. While a crack in its early stages may, in fact, be tight (in that it does not allow the passage of flue gasses) nevertheless, heat exchangers never "heal". Instead, the crack or hole will probably increase in size with age. There are no approved methods for patching or re-welding cracks or holes in heat exchangers.

If a hole or a crack in the heat exchanger is reported, then replacement of the heat exchanger or the entire furnace should be anticipated. While some persons may argue that a hairline crack is not of sufficient width to allow the passage of flue gases into the air stream of the house, nevertheless, a crack of any kind in the heat exchanger is usually cause for the gas supplier to "red tag" the furnace. This means that the furnace cannot be operated until proper repairs are made or the furnace is replaced.

During our inspection, we will not *completely* disassemble the furnace. Industry standards limit the home inspector to removal of those covers or doors that normally could be removed by a homeowner. Generally, this is limited to the blower compartment door and possibly the flame shield over the front of the combustion compartment. Thus, depending on the particular type of furnace and associated access limitations, an examination of the furnace done during a normal home inspection may only be able to cover ten to twenty percent of the interior of the heat exchanger. The only way to examine the entire heat exchanger is through a process called a "teardown inspection".

Such an inspection requires the complete disassembly of the furnace and should only be undertaken by a competent heating technic ian who possesses the appropriate licenses, tools, equipment and knowledge. During a teardown inspection, it is common for the burners to be removed from the combustion compartment as well as for portions of the furnace cabinet to be removed or for the heat exchanger itself to be removed from the furnace. An in-depth examination such as this makes it much easier to confirm the condition of the heat exchanger. If a recommendation is made in the Client Advisory section of the report to undertake a complete examination of the furnace, the intention is to call for a teardown inspection.

Environmental Influences on the Lifespan of a Furnace

You can extend (or prematurely shorten) the life of your furnace by altering the environment in which it operates. High humidity in the area where the furnace is installed may damage the furnace. This is particularly likely where furnaces have been installed in underbuilding crawl spaces and where the crawl spaces are excessively moist or even wet. Obviously, since most heat exchangers are made of mild steel, they are particularly susceptible to rusting and premature failure due to high humidity.

Another factor that can prematurely shorten the life of a heat exchanger is the installation of a humidifier in the warm air plenum immediately *above* the furnace. Such installations are definitely *not* recommended. If the humidifier float valve malfunctions and allows excess water into the humidifier reservoir, that water may end up overflowing down *inside* the furnace where it ends up on the heat exchanger. If this happens over a long enough period of time, the exchanger can be rusted through from the outside.

Another environmental concern involves the placement of “kitty litter” or “litter boxes” in the vicinity of your furnace. Most kitty litters contain chlorine as a sanitizing and odor reducing media. The chlorine is outgassed from the kitty litter and permeates the surrounding air. When this excess chlorine comes in contact with the metal surfaces of the heat exchanger, it can cause accelerated corrosion due to the abnormal concentration of chlorides. So, you see why it is a good idea to put the kitty litter box somewhere well away from the furnace.

Operational Influences on the Lifespan of a Furnace

The primary operational influence on the lifespan of a furnace requires keeping the combustion system properly tuned. A competent heating technician should check the fuel-air mixture at the burners and check the overall combustion efficiency at least every other year. During this check, the heating technician will also check the adjustment of the pilot and will check for excessive roll-out on ignition. Roll-out, or delayed ignition, is the process whereby, when the main gas valve opens and the main burner ignites, the flame extends outside of the combustion compartment, often through or past the flame shield.

Excessive roll-out over a period of time can result in destruction of electrical wiring in the furnace vestibule in front of the combustion compartment. Excessive roll-out is often a symptom of a dirty combustion compartment and/or maladjustment of the burner ignition system.

Another operational requirement is the conscientious maintenance of clean furnace filters. An excessively dirty furnace filter is likely to impede the flow of air through the heat exchanger enough to cause the temperature of the heat exchanger to rise to a level where it will actuate the high limit control, causing the furnace burner to shut down. If an excessively dirty filter is causing the burner to overheat the heat exchanger, this can lead to premature failure of the heat exchanger.

Finally, when lighting a pilot or replacing a filter on a furnace, make sure that the front panels (upper and lower) are replaced properly. Even a slight gap or opening left along the side of the panels could allow combustion products to be drawn into the house. Never allow an opening (such as an air grille) in the return air system anywhere within the furnace room.

To Sum It All Up

In summary, several important points should be remembered. First, if the inspection notes the existence of a crack or hole in the heat exchanger, we would strongly advise further investigation by a competent heating technician. Second, you, as the homeowner, should take steps to provide the most suitable environment for your furnace. This will include keeping kitty litter away from the furnace room area and/or providing a dry crawl space in which the furnace can operate. Third, it is very important to maintain the filter in relatively clean condition so as to avoid overheating the heat exchanger. Fourth, if there is a furnace (or duct) mounted humidifier, which is marginally functional or difficult to access and disassemble, then remove and do not replace it. Finally, invest in a visit from your heating technician on an every-other-year basis for an inspection, general tune up and service of your furnace.

Further Evaluation Was Suspended

Because of the relative severity of the conditions found in the heating system, further inspection of the system was suspended. A competent and qualified HVAC systems specialist should take over and conduct a full evaluation of the heating system.

Air Filters Need Regular Service

All types of heating and air conditioning system filters need regular servicing for efficient operation of the equipment. Typical intervals would be every thirty to sixty days during each heating and/or air conditioning season. In all cases, we advise following the manufacturer's specifications.

Important Tips On Changing Filters

It is extremely important that the homeowner (or occupant) change (or have someone else change) the furnace filter(s) regularly – every 30 to 60 days during the heating (and cooling, if you have central air conditioning) season. This is important for the safe operation of your furnace. Furnace filters that are very dirty will significantly slow the flow of air through the furnace heat exchanger, causing the heat exchanger to get much too warm. This may, in turn, cause the high limit switch to signal the main gas valve to shut down the burner prematurely. The last stage of this process causes the furnace to cycle against the high limit control, often resulting in expensive repairs. If the furnace also has evaporator coils for a refrigerated central air conditioning system, then the evaporator coils (which consist of hundreds very thin closely spaced aluminum fins, like the radiator in your automobile) will, by default, become a secondary air "filter". The evaporator coils will then become clogged with dirt, necessitating a very expensive service call to remove and clean them.

When installing the new filter, if it is one of the "disposable" types with a rectangular cardboard frame, be sure to place it in the proper position with the arrow on the frame marked "Air Flow" pointing in the direction that the air flows into the furnace blower compartment. With "Hammock" type air filters, remember that the filter media is supposed to be at least two inches wider than the wire mesh "basket" that it is installed upon! The wire mesh basket should be centered on the filter media so that there is "extra" media material on both the front and rear to form a seal between the edge of the "basket" and the front door (and rear wall) of the blower compartment. Finally, keep in mind that the filer media goes on the OUTSIDE of the "basket".

The Wall Cavities Were Not Accessible

We were unable to access the wall cavities and/or determine the presence or condition of wall insulation.

Cooling System

CLIENT ADVISORY

The difference in temperature between the air entering the return to the system and the air being supplied from it was carefully measured with the system running during the inspection. This temperature differential, or temperature drop, was found to be outside of generally accepted industry standards. This condition could indicate excessive wear in the compressor, low refrigerant level, leaking seals, obstructed air flow across the evaporator coil, or other possible concerns. We recommend further investigation and repair as appropriate by a competent, licensed technician.

DESCRIPTIVE INFORMATION

Type of Cooling System: • Central air conditioning system sharing distribution with a gas fired furnace
Energy Source for Cooling: • Electricity
Cooling Capacity: • Approximately 3 tons
Cooling System Age: • Original installation

OBSERVATIONS & RECOMMENDATIONS

Type Of Cooling System

Cooling was accomplished by electrically powered refrigerant compression, with the cooling (evaporator) coil mounted adjacent to the gas fired furnace.

Cooling Equipment Compressor/Condenser

Some of the metal cooling fins on the condensing unit were damaged. Damaged fins can significantly reduce the efficiency of the system, but in this case, damage was not serious enough to appreciably affect the system performance, and repair is not necessary. Special care should be exercised to minimize future and perhaps more serious damage, however.

Cooling Equipment Compressor/Condenser

← For important additional information on this item, please be sure to read the Client Advisory in the column to the left.

Refrigerant Lines

Insulation was deteriorated and missing from a portion of the refrigerant lines near the condensing unit. All missing insulation should be replaced to restore the energy efficiency of the system.

Cooling System Electrical Wiring

The equipment local disconnect acts as a shut off switch for use in an emergency or while servicing.

A local disconnect or other means of de-energizing the equipment was not located during this inspection, as required by present standards. For maximum safety, a local disconnect should be installed.

General Comments About The Cooling System

The cooling equipment was old according to manufacturer expectations. Although still operational, the need for replacement should be expected very soon.

ADVICE, PRECAUTIONS & CONDITIONS AFFECTING THE SCOPE OF THE COOLING SYSTEM INSPECTION

Scope of the Air Conditioning System Inspection

Inspection and evaluation of the condition of the cooling system was limited to visible components and their basic functions. A full evaluation of the condition of the central air conditioning equipment requires extensive testing and is beyond the scope of a home inspection

Do Not Operate A/C System When It Is Below 65 Degrees Outside

Some authorities recommend running the compressor intermittently (perhaps once a month for a few minutes) during the season to keep the seals lubricated and pliable so that they will not begin to leak as soon. Extreme care must be taken to insure that the compressor is NOT operated when the outside temperature is below 65 degrees Fahrenheit, or serious damage may occur to the compressor itself!

The lubricant placed inside the factory sealed compressor unit of an air conditioning system during manufacturing will become very viscous (thick, like syrup) when subjected to cool temperatures. When it becomes thick, it will not circulate properly and doesn't adequately coat all of the internal moving parts.

For this reason, manufacturers of air conditioning compressors strongly recommend against running these units for any length of time when the outside temperature is below 65 degrees Fahrenheit. To do so invites the risk of mechanically seizing the compressor. Once a compressor has seized, the only course of action that can restore proper operation is to completely replace the compressor itself – often to the tune of $1,000 to $2,000, depending upon its size.

Annual Cleaning for Evaporator Coils

The evaporator coil can act as an "air filter" collecting dirt and dust that then becomes available to circulate throughout the house. The dirt can also act as an insulator that reduces the efficiency of the system. Annual cleaning of the coil should be considered essential maintenance.

Interior Components

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DESCRIPTIVE INFORMATION

Number of Bathrooms:	• Two
Number of Bedrooms:	• Three
Window Material:	• Exposed aluminum frame
Window Glazing:	• Single pane
Wall Finish:	• Gypsum wallboard, commonly called "Drywall"
Ceiling Finish:	• Gypsum wallboard, commonly called "Drywall" • Spray applied acoustical texture

OBSERVATIONS & RECOMMENDATIONS

Interior Doors

Several of the doors throughout the dwelling were in need of attention. We recommend adjustment, trimming, restoration, or replacement of interior doors as required, for smooth operation and full function.

Interior Surfaces

The interior wall, floor, and ceiling surfaces gave the appearance of having been professionally installed and were generally in acceptable condition, taking into consideration the effects of normal wear and tear.

Floors

The floors had a good appearance and were in acceptable condition.

Interior Walls

The interior walls were generally in acceptable condition.

Ceilings

The ceiling or the underside of the roof in this dwelling was generally in acceptable condition.

Interior Doors

The garage door did not latch properly. Often, all that is required to restore proper latch function is to adjust the location of the strike plate on the doorframe. If adjusting the strike plate is not sufficient to restore proper function, then the recess behind it may have to be enlarged to restore full operation.

Windows

The operation of the sliding windows was rough. These windows and their associated hardware should be cleaned, lubricated, and adjusted for smoother operation. Where essential hardware is damaged or missing, it should be replaced with compatible pieces.

The operating mechanism on the east wall window in the family room was defective. Any missing or malfunctioning operating hardware should be repaired or replaced to restore the operation of all windows.

The Fireplace(s)

← For important additional information on this item, please be sure to read the Client Advisory in the column to the left.

The mortar in the firebox of the fireplace was soft, and mortar was missing from around the bricks. All loose mortar in the firebox should be removed and new mortar installed. This is known as "tuck pointing."

General Comments About the Interior

In addition to any specific rooms noted, we inspected all rooms generally considered to be habitable space. These usually include the living room, dining room, family room, den, bedrooms, utility room, etc., in addition to the kitchen, bathroom, laundry area and garage, as applicable.

The interior surfaces, hardware, fixtures, doors and windows were properly installed and in acceptable condition.

Kitchen

The Sink

When the sink was operated, it was fully functional and in acceptable condition.

The Dishwasher Drain Separation

The dishwasher drain was equipped with an air-gap fitting (the cylinder protruding above the sink). This device assures separation of the supply water from the wastewater.

Cabinets & Countertops

The cabinets were in acceptable condition.

The countertop showed typical wear and tear, normal for this heavily used component. We considered any flaws cosmetic in nature with no action indicated.

Cooktop

The cooktop was turned on with the normal operating controls and was in satisfactory working condition.

One of the controls for the range was broken or missing. We recommend repair for full use of the range as designed.

Oven

← For important additional information on this item, please be sure to read the Client Advisory in the column to the left.

Garbage Disposer

The disposer was turned on with normal user controls and was in satisfactory working condition.

Dishwasher

The dishwasher responded to normal user controls and was operational.

Kitchen Exhaust

The blower and ducting for the kitchen ventilation system were in acceptable condition.

A faucet on the kitchen sink leaked at the base, allowing water to drop into the cabinet below. Continued wetting of the cabinet shelf and the contents below will lead to unnecessary expense and damage.

Water Supplies, Faucets and Drains

← For important additional information on this item, please be sure to read the Client Advisory in the column to the left.

Hall Bath

Washbasin

The washbasin was properly installed. When operated, it was fully functional and in acceptable condition.

Bathtub

The surface finish of the bathtub was chipped. In our opinion, this condition was primarily a cosmetic concern. However, if rust develops, we recommend repair, refinishing or replacement of the tub.

The edge of the flooring at the base of the tub was open. All open joints in the flooring should be caulked or recaulked to reduce the potential for water penetration and possible damage to the subfloor.

Shower and Shower Surround

The shower/tub water supply valve(s) and shower diverter were operated for the inspection. The valve(s) and diverter were in acceptable condition.

The shower wall or surround was covered with fiberglass. Surface cracks were observed on the walls, however they were functioning as intended and were in acceptable condition. These cracks were cosmetic and did not affect the performance of the walls.

The caulking at the interface between the bottom of the shower surround and the top of the shower base was cracked and/or deteriorated. We recommend removal of all loose or defective caulking followed by careful re-caulking with appropriate high quality caulking. In the future, the condition of all caulked joints should be regularly monitored, and the caulking should be renewed whenever appropriate to maintain a watertight joint.

Toilet

The toilet was made of vitreous china, with a porcelain finish. The toilet was flushed and functioned properly.

Bathroom Ventilation

Ventilation for this bathroom was adequate.

Cabinets & Countertops

The cabinets were in acceptable condition.

The countertop showed typical wear and tear, normal for this heavily used component. We considered any flaws cosmetic in nature with no action indicated.

Master Bedroom Bath

Washbasin

The washbasin was properly installed. When operated, it was fully functional and in acceptable condition.

Shower and Shower Surround

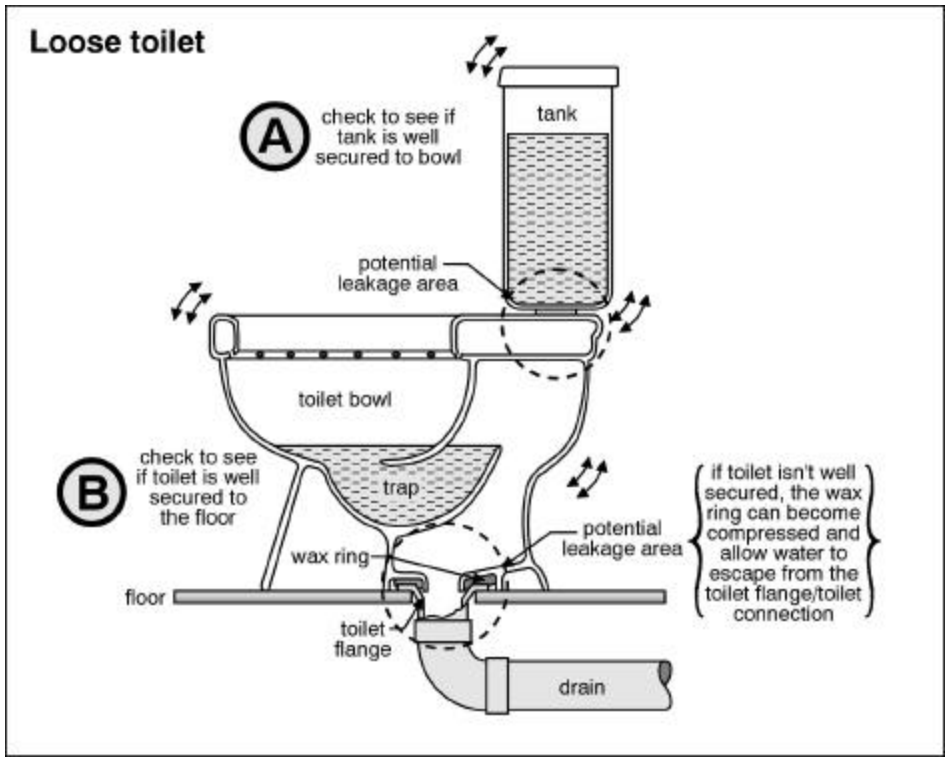
The shower was operated for the inspection. The shower valve(s) and showerhead were in acceptable condition.

Joint caulking around the base of the stall shower was mildewed and deteriorated. Mildewed joints should be scraped clean, chemically treated to eliminate the mildew and then be re-caulked in accordance with standard trade practices, or the caulk manufacturer's specifications, for a better appearance and to help to reduce the potential for moisture penetration into concealed areas, which could possibly cause more serious damage. The shower walls were functioning as intended and were in acceptable condition.

Toilet

➔ **For important additional information on this item, please be sure to read the Client Advisory in the column to the left.**

The master bathroom toilet was not securely attached to the soil pipe flange at the floor. A competent, licensed plumber should remove the toilet, inspect the floor for damage, and after repair of any floor damage, reset the toilet, securely to the floor, using a new bowl wax.



Bathroom Ventilation

Ventilation for this bathroom was adequate.

ADVICE, PRECAUTIONS & CONDITIONS AFFECTING THE SCOPE OF THE INTERIOR INSPECTION

Representative Sampling of Windows

A representative sample of the windows was operated in each room, but not every window was opened, closed and latched. Nationally recognized home inspection standards require testing a minimum of one window in every room, where accessible.

Consider Upgrading the Single Pane Windows

The windows in this dwelling were single glazed only. In spite of the fact that they have undoubtedly given years of good service, we recommend consideration be given to upgrading to modern, double-pane windows for improved operation and increased energy efficiency.

No Smoke Detectors In Sleeping Rooms

The latest standards require that smoke detectors be installed in all bedrooms at the time of construction, or later, if any significant work is done on the residence. Whether or not installation is required prior to sale of this building, upgrading should be considered.

Acoustical Texture May Contain Asbestos

Because of the age of the dwelling and the type of construction, the sprayed-on acoustical texture on the ceiling may contain asbestos. Actual asbestos content can only be determined by laboratory testing. Further information on asbestos can be obtained from a licensed asbestos consultant or abatement contractor.

Advice On Toilets Noted As Being Loose On The Floor

If your property inspection report contains a notation that one or more toilets were "loose on the floor", we strongly recommend that these toilets be removed and reset by a competent, licensed plumber. At the time that the toilet is removed, and before it is reset, the floor in the vicinity of the toilet should be carefully inspected for damage, rot or other deterioration caused by water seeping past the bowl wax (seal) at the base of the toilet. You should arrange to be present in person for this inspection or have a competent third party present to represent your interests and report on the findings.

Wall and Window Coverings Are Not Included in a Standard Home Inspection

Wallpaper and other types of wall coverings, as well as window coverings, are not considered a part of a standard home inspection and, in most cases; no comment on their condition will be made.

Floor Coverings Are Not Included in a Standard Home Inspection

Floor coverings are not considered a part of a standard home inspection and, in most cases; no comment on their condition will be made. Floor coverings are not lifted for inspection of the underlying finishes, and hidden conditions may be present. We do not represent that cleaning, in and of itself, will remove any or all stains or odors. We suggest that if any of these conditions are present, one should consult with the appropriate floor or covering specialist.