

## PLUMBING & HOT WATER HEATER INSPECTION

### SCOPE OF THE PLUMBING INSPECTION: 266CMR: BOARD OF REGISTRATION OF HOME INSPECTORS 266 CMR 6.00: STANDARDS OF PRACTICE:

#### 6.06 System: Plumbing

- (1) The **Home Inspector** shall **Observe**:
  - (a) The exposed **Readily Accessible** and **Observable** interior water supply and distribution system including:
    1. Piping materials, including supports and insulation.
    2. Fixtures and faucets.
    3. Functional Flow.
    4. Leaks.
    5. **Cross Connections**.
  - (b) The exposed **Readily Accessible** interior drain, waste and vent system, including:
    1. Traps; drain, waste, and vent piping; piping supports and pipe insulation.
    2. Leaks.
    3. Functional Drainage.
  - (c) Hot water systems including:
    1. Water heating equipment.
    2. **Normal Operating Controls**.
    3. **Automatic Safety Controls**.
    4. The exterior of the chimneys, thimbles and vents.
- (2) The **Home Inspector** shall **Describe**:
  1. The type of water supply and distribution piping materials (brass, copper, steel, lead, plastic, other).
  2. The type(s) of drain, waste, and vent piping materials (brass, copper, cast iron, lead, plastic, steel, other)
  3. The type of water heating equipment, flue pipe and capacity (gas, electric, oil, tankless, solar, other), the nameplate, capacity of the water heating equipment (gallons and or gallons per minute).
- (3) The **Home Inspector** shall **Report On** and recommend repair (if needed):
  - a. The location of the main shut off valve.
  - b. The water heater.
  - c. The existence of a pressure/temperature valve and vacuum relief valve.
  - d. The exposed flue piping and the existence of thimbles in the chimney.
  - e. The existence of **Cross Connections** if **Readily Accessible** and **Observable**.
  - f. The **Readily Accessible** and **Observable** waste and water distribution systems.
  - g. The existence of any visible leaks.
  - h. The operation all plumbing fixtures, including their faucets and all exterior faucets attached to the house if **Readily Accessible**.
- (4) The **Home Inspector** shall **not** be required to:
  - (a) Test the operation of any valve except **Readily Accessible** water closet flush valves, fixture faucets.
  - (b) Collect engineering data on the size of the plumbing equipment, the size or length of water and or waste systems and or remove covering materials (**Engineering/Plumbing services**).
  - (b) Report on the adequacy and/or the efficiency of the in place systems to provide sufficient hot water to the dwelling, sufficient water supply or drainage for the dwelling (**Engineering services**).
  - (c) State the effectiveness of anti-siphon devices (**Engineering/Plumbing Services**).
  - (d) Determine whether water supply and waste disposal systems are public or private (**Seller or Sellers Representatives Responsibility**).
  - (e) Operate **Automatic Safety Controls**.
  - (f) Operate any valve except readily accessible water closet flush valves, fixture faucets, and hose faucets.
  - (g) **Observe, Describe** or **Report On**:
    1. The exterior hose bibs.
    2. Water conditioning systems.
    3. Fire and lawn sprinkler systems.
    4. On-site or public water supply quantity and quality.
    5. On-site or public waste disposal systems (Title V Inspection).
    6. Foundation sub drainage systems.
    7. Spas, except as to functional flow and functional drainage.
    8. The interior of flue linings.

9. Underground utilities, pipes, buried wires, or conduits (Dig Safe).

10. Automatic Controls.2

2 **Home** and **Associate Home Inspectors** are prohibited from testing automatic controls with the noted exceptions of the arc and ground fault protective devices.

**DISCLAIMERS:** The following items are **EXCLUDED** from this report: underground pipes or pipes within walls, floors and finished ceilings, remaining life, solar systems, the effectiveness of antisiphon devices, determination of public versus private water supply and waste disposal systems, operation of automatic safety controls, operation of any valve except water closet flush valves, fixture faucets, and hose faucets. Also excluded are water conditioning systems, fire and lawn sprinkler systems, on-site water supply quantity and quality, on-site waste disposal systems, foundation irrigation systems, spas and central vacuum systems. The condition of walls behind appliances or floors under appliances is not determined since the units are not moved during this inspection.

**GENERAL COMMENTS:** A. Area public & private water supplies tend to have a high mineral content that is slightly corrosive to copper pipes, fittings, valves, boilers and hot water heaters. There is always a possibility of future leaks or blockages that did not exist at the time of inspection. You should inspect your plumbing system annually for greenish or whitish signs of corrosion and perform maintenance repairs as required. Expect future repair or replacement of faucet & toilet components through normal wear & tear. B. If your prospective older home has a remaining old steel service pipe, the future replacement will be your financial responsibility. The lifespan of old water service pipes is unpredictable but weak water pressure may be a telltale sign of needed age replacement. C. Be advised that the main shut-off valve was not tested during the inspection as they often can develop maintenance leaks or upset the owner. You should test the valve if you buy the home. D. Be advised that well pumps have an average life expectancy of 10-12 years. E. Be advised that new homes now have 3/4" dia. water lines across the basement and 1/2" dia. piping leading to each fixture. Older 1/2" piping systems or brass or steel water piping are candidates for age replacement. E. Older homes may not have local shut-off valves, P-shaped traps and re-vent connections. While appropriate for an older home, such old plumbing will have to undergo required major updating to comply with current codes during any kitchen or bathroom remodeling. **F. Be advised that hot water heaters have a short 5-12 year lifespan depending on brand, budget for eventual age replacement.** Set water temperature control no higher than 130 degrees F. max. at the faucets and 112 degrees F. max. at the shower heads to prevent scalding. G. Private waste disposal systems should be pumped out for general maintenance at least every three years to protect the leaching field. H. If your prospective new home has a "tankless coil" at the boiler for domestic hot water production, then updating the system by installing a modern "indirect water heater" is highly recommended to insure adequate hot water. I. **NOTICE: Homes built before 1987 are likely to have 50:50 lead / tin soldered joints in the copper water pipes.** Be advised that lead is a health hazard in high concentrations. There is a controversy that the old lead solder is not a problem as it has been coated by minerals within the pipes over the years that prevent the lead from leaching into the water. Be further advised that this argument may be correct but true lead content in the water supply is undetermined. If you have health concerns, then suggested options include: further testing of the solder for lead content, further testing of the water for lead content or replacement of all old lead soldered joints if present. J. If the home has a public sewage connection, then you should verify the disclosure with the local public waste disposal department. K. If the home has a private waste disposal system, then the owner is required to give you a copy of an 11-page Title 5 inspection report. Be advised that you may also hire your own Title 5 inspector to verify conditions prior to the close of escrow.

**Important Note:** Repairs attempted by untrained or unlicensed individuals to any plumbing component may result in malfunctions in the supply and waste piping or water leaks that can lead to hidden damage, including mold. It is recommended that any of the listed repairs or improvements below be performed by a licensed plumber. **I advise that you ask the owner / occupant about any known current or prior plumbing problems in the home.**

## 1. PROBABLE TYPE OF WATER SERVICE:

### TYPE:

**WELL GENERAL EXPLANATION:** The home has a private well as a water supply and attached pump and holding tank equipment. **Be advised that if a well is present, the owner of the property (YOU) is responsible for the quality of the water.**

The visible and accessible parts of the well and pump equipment were evaluated for condition and function as rated in this report. Water is tested at fixtures for functional flow only.

**DISCLAIMER / EXCLUSIONS:** Well depth, seasonal flow rates, water quantity, adequacy of water supply and quality testing and future performance are

**undetermined and beyond the scope of this limited inspection. To determine the capacity, the well depth, static water level and recovery rate will have to be determined by a licensed contractor, as this is not within the scope of a home inspection limited by time and other constraints.**

The presence of a well should not dissuade you from purchasing the home, but you should understand its mechanical operation, past history of performance, anticipated service life, health implications and required maintenance.

Firstly, you should question the owner as the best source of information. Ask about the exact location of the well & waste disposal system to make sure that they are separated by a minimum 100 feet to prevent contamination. Ask about the depth of the well, the type & age of equipment, past performance, performance during drought conditions and what local well company is available to service the system. Ask when the water was last water quality tested and what the result were. Ask who services the well. Note: Well installers have been required to register a well and its specifications with the local board of health since 1974. The local board of health should have a copy of the well completion report that you can review. If the system has attached water filtration or softening equipment, its operation and maintenance should be reviewed with the owner.

**NOTICE: TESTING FOR BACTERIAL AND CHEMICAL POLLUTANTS IS ADVISED PRIOR TO COMMITMENT AND ON AN ANNUAL BASIS TO PROTECT THE HEALTH OF THE OCCUPANTS.**

Note: Wells in this area (south of Boston) are prone to high mineral content (iron & manganese) levels and a slightly acidic ph, making the water hard and slightly corrosive to copper piping, boilers and water heaters. Analysis of the water may reveal the need for conditioning equipment.

#### **How does the well work?**

Mechanically, when a faucet is turned on, water under pressure flows from the pressure tank. The pressure tank or holding tank is the equivalent of a city water tower. It has an air valve provided to re-charge the air pressure within the tank when needed, as the air charge is sometimes diminished through normal use. An instruction tag is usually posted at the air valve (75 psi is a normal rating). As the water in the holding tank is drained out, air within the tank expands until a small gray control box called the pressure switch, senses an average 20 psi differential within the tank. The pressure switch signals the pump to operate bringing more water from the well and re-compressing the air within the holding tank. The pressure switch then signals the pump to turn off. When properly functioning, an attached water pressure gage will read a 20 psi differential as the pump cycles on and off. During the pump cycling, the water pressure should remain functional at three plumbing fixtures during simultaneous use. Any short cycling of the pump or pressure problems may indicate that repairs are needed.

Wells and well equipment can be configured in many different ways, but regardless of the type, all pumps and attached equipment represent mechanical devices subject to unpredictable maintenance repairs or age replacement. Most shallow well jet type pumps have a service life of 5-10 years depending on the chemical content of the water. Most deep well submersible pumps have a service life of 10-12 years depending of the chemical content of the water.

To prevent water problems, I recommend that you **purchase a service contract with a local well contractor**. In addition, I recommend that you monitor all well equipment for signs of corrosion, leaks and pressure or volume problems. Remember that the well pump and controls are mechanical appliances with an unpredictable design life - future breakdowns are inevitable. Notice: If the power is lost, the well equipment will not function. For that reason, a gasoline driven portable generator is advised for use during storm outages. You may wish to consult an electrician

regarding an optional generator installation.

More Information: [www.des.state.nh.us/wseb](http://www.des.state.nh.us/wseb) then select "FACT SHEETS"

**Recommendation:** As the owner of a private well, four categories of annual water quality testing are advised:

- \* Radio chemistry
- \* Inorganic chemistry
- \* Organic chemistry
- \* Microbiology

**Also, I advise that you sanitize the well annually.**

## PRIVATE WELL EQUIPMENT & CONDITION:

**Observation:** **SUBMERSIBLE PUMP EXPLANATION** - the water supply for this home is provided by a private well, and the well water is lifted to the home by a submersible pump.

**Analysis:** As a general explanation, a submersible pump is a self-priming mechanical device that is physically suspended inside the well near the base of the shaft. Usually, the presence of a submersible pump indicates a well of greater depth as this type of pump has far greater lifting power than other shallow well pumps. The actual depth for which the pump is rated depends on its horsepower, the number of stages and the design of the appliance.

The following is a description of the parts of the system from the well to the house: Inside the well shaft, a vertical pressure line lifts water upward from the pump to below the ground and then makes transition to a horizontal water supply pipe. The water supply pipe running from the well to the house is buried below the frost level to prevent freeze-ups and connects to the vertical pressure line with a pitless adapter below ground.

Above ground is a round pipe or shaft protruding at least 12-24 inches above the ground and a watertight metal cap. The electrical power cable is located within a plastic raceway or conduit along side the well shaft and leading inside the well cap. Beneath the cap, the wires are spliced to allow disconnection should the pump require removal and maintenance.

Both the buried water supply pipe and the power cable run into the basement of the home (or other utility area), where they are connected to the pressure storage tank, pressure switch, power supply and finally the plumbing system inside the house.

The pressure storage tank contains air that is compressed by the water that is forced into it by the pump. The air under pressure forces the water out of the tank and through the pressure pipes to the fixtures when water is demanded. The pressure switch senses the air pressure within the storage tank and instructs the pump to cycle on & off by lifting more water from the well at set low and high limits.

A submersible pump represents current technology for a well system, but you must have realistic expectations regarding its performance and design life. As a mechanical device, its function can be impaired by normal wear & tear, minerals, sediment or other mechanical breakdown. The pump and other components will all need unpredictable future repair or replacement. (The exact service life of the pump is unpredictable but may be between 7-12 years)

Recommendation: As you must rely on the quality of the well water and the function of the pump, you should have the water tested annually and should secure a service contract with a local well equipment company. You should retain the services of a local well installer to service the well, pump, holding tank and pressure switch. Lastly, you should consider installing a generator to power the pump when electricity is lost. **Ask the owner the age of the pump NOW, prior to commitment.**

**TYPE OF SERVICE/**

**SUPPLY PIPING:** Observation: The home has a modern plastic water (polyethylene) service pipe. Analysis: This is a desirable and corrosion resistant type of water service piping material that is now often used in place of copper.

**CONDITION:** FUNCTIONAL.

**WATER SERVICE PROBLEMS:**

Observation: No visible problems observed where exposed and *readily accessible* at time of inspection.  
**(DISCLAIMER: The condition of buried or concealed piping is undetermined.)**

**2. MAIN VALVE:**

**LOCATION:**

The main shut-off valve is located next to the pressure tank in the basement.



**CONDITION / PROBLEMS:**

\* **FUNCTIONAL** where *readily accessible* at time of inspection. **NOTICE:** Be advised that the main water shut-off valve was not tested during the home inspection and that its true operational condition is undetermined. The valve was not tested as the inspector would be liable for breakage, leakage or loss of water. Further investigation and testing are needed by YOU or by a plumber.

### 3. INTERIOR PRESSURE PIPING:

#### TYPE OF DISTRIBUTION PIPING

#### MATERIAL/S:

Observation: The home has copper pressure piping as observed in the unfinished spaces.

Analysis: Copper is a sign of modern pressure piping. However the copper piping will still need to be monitored for corrosion and future maintenance repairs.

#### CONDITION:

\* **FUNCTIONAL** where exposed and *readily accessible* at time of inspection. (Note: The condition of piping concealed within walls or finished ceilings is undetermined.)

#### PRESSURE PIPING PROBLEMS:

Observation: No visible problems or leaks observed with the *readily accessible* pressure piping at time of inspection. Water pressure was functional at the three highest fixtures during simultaneous testing. Prior leaks had just been repaired.

Analysis: While no problems were observed at time of inspection, future leaks can occur in any home. The condition of piping concealed within walls, floors and ceilings is undetermined.

Recommendation: All plumbing systems should be monitored for wear and periodic maintenance repairs.

#### Are hot water pipes insulated?

Observation: Hot water pipes are not insulated.

Analysis: Heat loss will be excessive.

Recommendation: To reduce standby heat loss, you should install insulation on all exposed hot water pipes. At your option, cold water pipes can be insulated to reduce summer condensation problems.

### 4. OUTSIDE FAUCETS:

#### Condition:

Observation: At time of inspection, the outside faucets and water pipes were drained and shut-down for the winter. (Note: Home inspectors are not required to inspect exterior faucets or hose bibs. Faucets are reported as a courtesy only, without consideration.)

Analysis: As the faucets & pipes were shut-down to prevent freeze-ups, their true operational condition is undetermined. Further investigation is needed.

Recommendation: Each outside faucet should be tested when seasonal temperature permits.

(Note: Consider optional retirement of the old type faucets and upgrading to new antifreeze, self-draining faucets with check valves. Such new valves will eliminate the need for winter maintenance while better protecting the public water supply from contamination.)

### 5. DRAIN, WASTE & VENT PIPING (DWV):

#### Types of DWV materials visible:

**Plastic.** (Note: Plastic piping is now the most common material used in DWV piping.

For your knowledge, plastic waste pipes are a little more noisy but are much more

corrosion resistant.)

**Condition:**

\* **FUNCTIONAL.**

Observation: No waste piping leaks observed as fixtures drained.

Analysis: While *readily accessible* DWV piping appears functional at time of inspection, the condition of waste piping concealed by floors, walls and ceilings is undetermined.

Recommendation: All plumbing systems must be monitored for maintenance repairs and parts replacement.

**Drain, Waste or Vent piping problems:**

Observation: No visible drain, waste or vent piping problems or support problems were observed where ***readily accessible*** at time of inspection.

Analysis: Be advised that future leaks can occur in any piping system.

Recommendation: Plumbing systems should be monitored for needed maintenance repairs.



## 6. HOT WATER SYSTEMS:

### FUEL & TYPE OF EQUIPMENT:

Observation: The hot water is produced by a **COMPANION** storage tank attached to the heating boiler. (This is a modern state-of-the-art type of hot water production.)



### APPROXIMATE CAPACITY:

40 gallons capacity.

### Approximate age:

Observation: The age of the water heater is unknown.

Analysis: Be advised that a hot water heater has a relatively short design life. Knowing the age would be helpful for future budgeting as water heaters have a short 5-10 year design life.

Recommendation: Further research advised. Ask the owner how old the water heater is.

### CONDITION / PROBLEMS:

\* **FUNCTIONAL.** Hot water was available at each fixture serviced. The required automatic safety devices (shut-off valve, temperature/pressure relief valve and vacuum relief valve) are present and appear visually **FUNCTIONAL** as designed to protect the hot water systems & components from excessively high or low pressures & temperatures, excessive electrical current, loss of water, loss of ignition, fuel leaks, fire, freezing, or other unsafe conditions. (Controls are NOT tested.)



**EXTERIOR OF THE CHIMNEY, THIMBLES AND VENTS:**

Not applicable, this type of water heating appliance does not require venting.

**7. SECONDARY FIXTURES:**

**Type & condition:** Observation: No secondary fixtures present. Toilet, tub / shower & sink fixtures will be evaluated under kitchen and bathroom headings.

**8. LAUNDRY FACILITIES:**

**TYPES:** Washer hook-ups are present.  
Hook-ups are present for an electric dryer.

**CONDITION / PROBLEMS:**



\*\* Observation: Laundry facilities are **FUNCTIONAL** with exceptions noted:

Observation: While previously allowed, the receptacle provided for the electric dryer is an older style with three holes for a 3 prong plug that does not provide modern grounding.

Analysis: Be advised that the dryer circuits in new homes must now be wired with a four wire conductor cable feeding a four hole outlet to mate with a four prong dryer plug for added grounding safety. The receptacle must have four holes and the dryer cord (pigtail) must have four prongs to mate properly.

Recommendation: For safety, I advise that you hire an electrician to upgrade the dryer circuit wire, the dryer outlet and the appliance cord for modern grounding safety.

Web Resource: <http://www.homewiringandmore.com/switchoutlet/dryer/dryer.html>

Observation: The washing machine is installed level with or above living space and a protective safe pan is missing beneath the appliance.

Analysis: Without a safe pan under the washing machine, there is a potential for interior water damage if leakage occurs.

Recommendation: The installation of a safe pan with a drain is advised. Consult a plumber.

Web Resource: <http://www.floodsaver.com/Resources/BROCHURE.pdf>

## 9. SIGNS OF VISIBLE LEAKS: (DISCLAIMER: The condition of concealed piping is undetermined.)

**CONDITIONS:** Observation: No active pressure piping, waste piping or gas piping leaks were visible where *readily accessible* at time of inspection.  
Analysis: All piping systems are subject to varying rates of age deterioration. The condition of concealed piping is undetermined.  
Recommendation: You should monitor each piping system for future maintenance repairs.

### ANY SIGNS OF SUBSTANDARD WORKMANSHIP OR CROSS CONNECTION?

Observation: No signs of amateur workmanship or cross connections were visible where *readily accessible* at time of inspection.

## 10. WATER FLOW & DRAINAGE:

**WATER FLOW:** \* Observation: The water flow was **FUNCTIONAL** at all fixtures and during simultaneous testing of the three highest fixtures. Water pressure varies widely. On a well system, the normal pressure is 20 to 60 psi, with a delta pressure of approximately 20 psi. The delta is determined by the pressure difference between when the pump comes on and when it is switched off again. City water pressure is normally 40 to 60 psi.

**DRAINAGE:** \* **FUNCTIONAL.** Observation: The drainage was functional at time of inspection at all accessible plumbing fixtures. (Note: The evaluation of appliance drainage is beyond the scope of this limited home inspection.)

## 11. WERE ALL FIXTURES AND FAUCETS OPERATED?

YES. All *readily accessible* fixtures and faucets were operated by the inspector.

## 12. OVER-ALL CONDITION / RECOMMENDATIONS:

### Plumbing system summary:

In my opinion, where *readily accessible*, the plumbing system appears to be in an over-all **FUNCTIONAL** condition. No critical repairs were observed at time of inspection. Nevertheless, all home owners must monitor their plumbing system for needed maintenance repairs as local water quality can be corrosive to copper piping, fittings, valves, boilers & hot water heaters.

**SPRINKLER SYSTEM DISCLAIMER:** The home has a commercial grade sprinkler system for fire prevention installed in the home. This is not inspected and is excluded in this report. I would recommend you take the number off the control box and call the installation company to come inspect and test the system to make sure it is operational. There are some dry water stains that are located at both sprinkler heads and appear to run along sprinkler lines. Further investigation is needed.

Observation: The home has a central vacuum system. I did not see an actual central vac unit in the basement.

Analysis: **DISCLAIMER - while I consider this system to be a positive feature in**

**the home, its evaluation is beyond the scope of this limited visual inspection and is expressly EXCLUDED from this report.**

Recommendation: I advise that you ask the owner to demonstrate the operation and maintenance of the system prior to commitment and / or that you request a written affidavit attesting that the system is operational.