10.0 PLUMBING SYSTEM INSPECTION LISTS

10.1 WATER SUPPLY AND WASTE SYSTEM INSPECTION LIST

This inspection list is intended as a guide to the procedures to be considered when performing a standard limited time/scope inspection of residential plumbing systems. This information should be used in conjunction with applicable home inspection standards of practice.

1. Water Supply System
   - Attempt to determine type water supply system
   - Observe grounds in area deemed to be above water service supply line
   - Locate the main service line entry point, meter (if present), and main shut-off valve
   - Consider location of supply entry relative to waste disposal system or sewer line
   - Assess service piping for type pipe, size and condition
   - Observe meter, valve and pressure reducer presence and condition
   - Observe and trace all interior water distribution piping to termination points at fixtures/appliances
   - Assess pipe size, type pipe, installation methods and condition
   - Observe piping and shut-off valves at fixture connections
   - Operate all fixtures using faucets or other valves
   - Observe and operate exterior hose bibs
   - Observe for possible cross connections at fixtures and other points in system
   - Assess water flow (pressure and volume); assess with multiple (3) fixtures operating at once
   - Consider insulation and/ or freeze protection for piping in unconditioned areas
   - Observe entire system for leaks or evidence of prior leakage (including ceilings, framing, etc. below)
   - Check for adequate pipe support and evidence of water hammer
   - Assess for proper orientation and separation of hot and cold lines
   - Inspect domestic hot water system and distribution
   - Check for anti-siphon devices at hose bibs, boiler feed valves and laundry fixture when applicable
   - Note ancillary system connections (e.g., lawn irrigation, fire sprinkler, water treatment system)

2. Waste Disposal System
   - Attempt to determine type waste disposal system.
   - Observe area deemed to be over the waste or sewer lines
   - Observe number, size and location of plumbing vent stacks
   - Locate waste line exit point, observe traps, fresh air vents and cleanout provisions
   - Consider location of waste line exit relative to water supply system
   - Observe main waste line and stack materials, installation, cleanouts and condition
   - Observe and trace fixture and branch drain lines; note type pipe, installation and condition
   - Observe traps and connections at each fixture, including laundry standpipe
   - Observe and operate drain stopper mechanisms at each fixture
   - Operate each fixture water supply to assess functional drainage
   - Observe all fixtures and piping for leakage or prior leakage (observe ceilings, framing, etc. below)
   - Observe all horizontal lines for proper slope
   - Assess all lines for adequacy of flow
   - Observe air gaps at dishwasher, condensate drains, water treatment systems, relief valves, etc.
   - Assess vent provisions and location for each fixture group
   - Observe vent pipe conditions in attic or exposed areas
   - Observe laundry drain provisions
   - Observe and operate any ejector pump
   - Assess any check valves, location and need
   - Consider presence of sump pump or surface water drain connection to system
   - Observe sump or ejector discharge connection/point
   - Consider floor drain connection to waste lines
10.2 HOT WATER SUPPLY SYSTEMS INSPECTION LIST

This inspection list is intended as a guide to the general inspection procedures to be considered when performing a standard limited time/scope inspection of conventional domestic hot water systems. This information should be used in conjunction with applicable home inspection standards of practice.

1. **General factors to consider:**
   - Label/listing information (manufacturer, age, size, etc.)
   - Type system/fuel supply
   - Size of house/number of bedrooms
   - System storage size/recovery rate
   - Location/installation of unit
   - Venting provisions (when applicable)
   - Safety valve/controls
   - System operation (Do not operate any system that is not full with water)
   - Hot water distribution

2. **Assess the following components for all systems, as applicable:**
   - Age versus service life
   - Compatibility to house size
   - Accessibility to equipment
   - Overflow protection (attic/habitable area)
   - Evidence of leakage/corrosion
   - Thermal insulation provisions
   - Temperature drop from unit to fixtures
   - Clearances to combustibles
   - Presence of supply line shut-off valve
   - Proper hot and cold line orientation
   - Condition of controls/aquastats/thermostats
   - Presence/physical condition of safety valve (TPRV, SSV)
   - Safety valve drain line installation/termination
   - Protection of equipment from physical damage

3. **Evaluate distribution components including:**
   - Pipe installation/insulation
   - Hot water supply to each fixture
   - Adequacy of flow and volume
   - Typical (maximum/minimum) water temperatures at fixtures
   - Visual water quality (color, odors, etc.)
   - Water hammer conditions
   - Pumping equipment, where present

4. **For specific systems assess the appropriate components and special concerns.**
   - **Inspect storage tanks for:**
     - Overall tank/equipment condition
     - Presence of sacrificial anode
     - Indications of sediment build-up
     - Evidence of leakage
   - **Inspect heat exchangers for:**
     - Condition of exposed unit
     - Presence of mixing valve
     - Adequacy of flow and temperature gain
Inspect electric units for:
- Condition of electrical supply and components
- Proper overcurrent protection
- Existence of special metering provisions
- Adequate storage capacity

- Optional: check coil operation or continuity by using electric meter (follow manufacturer instructions)

Warning - Electric Shock Hazard! - Before removing any access panel on an electric water heater the electric supply to the water heater must be shut off or disconnected.

Inspect gas and oil fired systems for:
- Condition of fuel supply lines
- Presence of gas line shut-off near unit
- Condition of exposed fuel storage tanks
- Combustion air provisions
- Utility room/closet venting provisions
- Observe burner condition and operation
- Assess flame pattern/appearance
- Condition of combustion chamber
- Venting conditions/clearances
- Evidence of backdrafting concerns
- Elevation above floor in garage (18 inches)
- Vent dampers/power vents features

- Optional: testing utilizing a carbon monoxide or combustible gas detector

Note: Special systems such as “instant hot” point source type heaters, heat pump systems, high-efficiency systems, etc. can generally be evaluated using these guidelines, where appropriate: additional consideration must also be given to any specialized components.
10.3 PRIVATE ON-SITE WATER SUPPLY SYSTEM LIST

The evaluation of any private on-site water supply or waster disposal system is not part of the standard home inspection. If such an evaluation is performed by the inspector, it is provided as an optional service. There are no widely accepted standards of practice within the home inspection industry for these services. Consequently, the following procedures are a compilation of common practices and are provided for you guidance only. Where local standards exist or specific standards are recognized, such standards should be used as a guide to the inspection process.

The following is a listing of general inspection procedures to use for a limited evaluation of all conventional private water (well) systems. Where appropriate, or required by local practice or law, alternate or more comprehensive evaluation may be required or appropriate. This is not a well yield, well capacity or well recovery evaluation.

1. Property and system information:
   - Interview owner or occupants to determine:
     - System type and location
     - Prior system history/service record
     - Results of prior water sampling
     - Completed repairs or new components
     - Local approvals for any work
     - Recent operational status
   - Inform owner of inspection procedures to be performed
   - Consider local requirements for well systems and well inspections
   - Optional: review records, if readily available

2. Pre-test considerations:
   - Check type: cistern, shallow well, deep well, etc.
   - Observe well head (or apparent location)
   - Determine clearance from wells or property lines
   - Assess accessibility to equipment system for service and repair
   - Consider potential for contamination
     - Cap not watertight
     - Run off or other adverse conditions at wellhead
     - Low point in terrain or located in pit
     - Located within foundation perimeter, under deck, etc.
     - Insecticide treatment issues
     - Proximity to on-site waste system, if present (adjacent properties also)
     - Cross connections/backflow concerns
   - Observe mechanical equipment, if visible
     - Pumps, piping and wiring
     - Tank
     - Electric/grounding
     - Treatment systems
   - Check fixtures for evidence of adverse water conditions
   - Check water supply piping for water quality related conditions (pitting, scaling, etc.)
   - Check condition of well pit, cover or other enclosure
   - Observe freeze protection features
   - Check for old abandoned well/proper closure
3. **Operational tests:**
   **Pump evaluation:**
   - Make sure all faucets and other water taps in the house are off
   - Check pressure on gauge. If pump is running, wait for it to stop
   - Open a tap (near or at tank if feasible) and draw water until the pump starts
   - Immediately shut off tap
   - Check pressure gauge to determine pump start pressure
   - Beginning timing to measure pump run time
   - Record **pump run time** - the length of time between pump start and stop.
   - When pump stops, open sampling tap
   - Using a gallon jug or other device, measure volume until the pump starts
   - Stop volume measurement when the pump starts. The total volume measured is the 
     usable tank volume.
   - Divide the usable tank capacity by the pump run time to determine pump capacity.

   **Peak demand evaluation:**
   - Introduce water into fixtures
   - Add 50-75 gallons per bedroom (150-300 per normal house)
   - Use discretion on volume (base on size, prior use, recent occupancy status, etc.)
   - Add water in intervals, if necessary
   - **Do not draw down well or run well dry**
   - Regularly check fixtures for any signs of backup at fixtures
   - Monitor conditions at plumbing fixtures and private waste system, if present
   - Observe pressure gauge readings/changes
   - Check at start of test and at end of test
   - Check for cycling
   - Evaluate pump, if visible, for leakage, excessive noise, etc.
   - Check tank for evidence of corrosion, leakage, etc.
   - Note any excessive condensation/insufficient insulation
   - Observe flow at representative fixtures
   - Check single fixture and multiple fixture flow rates (pressure + volume)
   - Use flow meter or jug or other measured container
   - Check flow conditions at start of test and at end of test
   - Check time it takes to recharge tank (tank recovery)
   - Shut water off and observe time to buildup up to standby pressure
   - List for noise or running water when pump shuts down
   - Check piping for evidence of leakage
   - Assess visual clarity of water (general freedom from heavy sediment)
   - Assess water odor/effects on plumbing components (stains, etc.)

4. **Additional considerations:**
   - Be cautious of performing evaluation on vacant properties
   - Be aware drought conditions can affect water levels
   - Recommend evaluation by a well company as warranted, or as a precautionary measure

5. **Optional water testing:**
   - Follow lab guidelines on sampling methods
   - Inform client of usual turn-around time for results
   - General guidelines for bacteria test (if lab requirements unknown)
     - Remove aerator at kitchen sink
     - Sterilize faucet (if recommended by lab/health department)
     - Take sample using appropriate sterilized container
     - Sample must be delivered to/arrive at lab within 24 hours
     - Maintain temperature between 40° F and room temperature
   - Other tests/sampling
     - Use specified containers and follow specific guidelines
10.4 PRIVATE (ON-SITE) WASTE DISPOSAL SYSTEM LIST

The following is a listing of general inspection procedures to use for a limited evaluation of conventional private on-site waste disposal systems. Where appropriate, or required by local practice or law, alternate or more comprehensive evaluation procedures may be required or appropriate. Local licensing or certification requirements may exist for evaluators of these systems.

1. Property and system information:
   - Interview owner or occupants to determine:
     - System type and location
     - Prior system history/service record
     - Completed repairs or new components
     - Local approvals for any work
     - Recent operational status
     - Optional: review records, if readily available
     - Inform owner of inspection procedures to be performed
     - Consider local requirements for on-site systems or inspections

2. Pre-test considerations:
   - Attempt to determine system location
   - Assess accessibility to system for service and repair
   - Assess clearance from wells or property lines
   - Consider location related to floodways, swampy or rocky areas
   - Check plumbing system drain line connections to system
   - Attempt to determine type and number system(s) present
   - Observe drainage/surface conditions over system/field
   - Note any disposal or storm water connection to system (i.e., sump pump)
   - Observe any pumps, controls or other mechanical equipment, if present
   - Check for any surface discharge from system or laundry equipment
   - Optional: open and visually inspect tank(s) and/or distribution boxes for size, condition, sludge buildup, backflow, etc.

3. Operational test:
   - (Optional) Flush tracer dye into system at lowest toilet
   - Introduce water into fixtures
     - Add 50-75 gallons per bedroom (150-300 per normal house)
     - Use discretion on volume (based on size, prior use, recent occupancy status)
       - Add water in intervals, if necessary
       - Do not draw down well or run well dry
       - Monitor lower drains for any signs of backup
   - Duplicate test for any secondary or greywater system(s), where possible
   - Evaluate pumping or other mechanical equipment operation (if readily accessible)
   - Check all areas of field periodically during test for evidence of malfunction
   - Check field, including perimeter of property, for any signs of failure
   - Optional: return after 1 –2 days for secondary field check
   - Optional: probe absorption field or excavate test holes
   - Optional: check open tank conditions

4. Additional considerations:
   - Consider any evaluation with <7 days of continuous occupancy incomplete
Recommend pump and check for all systems, unless documentation available
Recommend evaluation by specialist as warranted or precautionary
Advise of need for local inspections or approvals, if known