

**I.) BUILDING INSPECTION:**

An interior and exterior visual inspection of the building will be performed to document building measurements, structural concerns, and existing conditions of the home. Moisture and Indoor Air Quality issues, which may impact the work scope, should also be evaluated. This evaluation will document:

1. Building volume and airtightness standard.
2. Existing and required attic ventilation (sq. ft.)
3. Gas leak testing (record pass or fail with corrective action or fail with no action)
4. Any concerns about the structure including signs of moisture, mold, pre-existing damage to the building or the interior and other conditions that might affect testing.

**II.) THERMAL ENVELOPE:**

Attic, wall, crawl space and basement insulation levels will be evaluated. Existing windows and doors will be inspected for type, overall fit and performance.

1. For each different shell component (attics, walls, basements, ect.) record the insulation material and estimated R-value.
2. Record framing and glazing type and overall condition of windows.
3. Record type and condition of exterior doors.

**A.) REPORT REQUIREMENTS & SPECIFICATIONS:**

*(All effective R-values for insulation levels are based on the BPI technical standards)*

Recommendations for additional insulation should be made if the existing level is at or less than the minimum existing R-Value listed in the table below unless there are health and safety, and/or structural issues preventing improvements.

BUILDING COMPONENT	MINIMUM EXISTING INSULATION LEVEL	ADDITIONAL CONCERNS
Attic Flat	R-15	All attic areas being insulated must be air sealed in accordance with BPI standards
Attic Slope	R-8	High density insulation or wind shielding should be used when appropriate.
Knee Wall	R-8	Exposed fiberglass must be wind shielded using an appropriate air barrier
Knee Wall Floor	R-15	Knee Wall Floor transitions must be effectively air sealed with high density insulation or other means
Attic Ventilation	Ventilation should be installed to meet building code when adding insulation.	
Exterior Walls	No Insulation	If minimal insulation levels exists, consider installing additional insulation material to improve thermal performance and/or reduce air leakage.
Unheated Basement Ceiling	No Insulation	Install insulation if the basement is unheated and the basement ceiling is air sealed. All ducts and pipes must be insulated/air sealed according to BPI standards.

BUILDING COMPONENT	MINIMUM EXISTING INSULATION LEVEL	ADDITIONAL CONCERNS
Crawl Space Ceiling	No Insulation	If existing insulation is in poor condition, damaged portions must be repaired or replaced. If existing insulation is wet, it must be removed. Install new insulation after all moisture sources have been addressed. All insulation to be installed as per BPI standards.
Garage Ceilings, and Walls Adjacent to Living Space	R-8	Garage connections to the house must be air sealed according to BPI standards using high density insulation or other materials
Cantilevers & Overhangs	R-8	Air seal using high density insulation or other materials where needed

**III.) DOMESTIC HOT WATER SYSTEMS:**

Evaluate existing conditions and inspect for proper operation and ventilation.

**A.) REPORT REQUIREMENTS & SPECIFICATIONS:**

1. Record the existing type and size of water heater (free standing, tankless, indirect, ect.)
2. Record the fuel type and venting type.
3. Record the condition of the system

Recommendations for new water heaters should be made if the existing system is in poor condition, improperly sized or creating a health risk that requires replacement. New installations must be in compliance with BPI standards for health & safety and proper sizing.

**IV.) HEATING SYSTEM INSPECTION:**

Evaluate existing conditions, including the distribution system, and inspect for proper ventilation

1. For each combustion appliance record the estimated or measured efficiency.
2. For each combustion appliance record the fuel type and venting type.
3. Record the heating system distribution type.

**A.) REPORT REQUIREMENTS & SPECIFICATIONS:**

Warm Air Furnace: Recommendations for new heating systems should be made if the existing system is in poor condition, improperly sized or creating a health risk that requires replacement. New installations must be in compliance with BPI standards for health & safety and proper sizing.

Heating distribution systems will be inspected and evaluated for each of the following: Location, Condition, Insulation Levels and Leakage

1. Record the primary location of the heating distribution system.
2. Identify if the distribution system is insulated or not insulated.
3. Record evaluation of duct leakage (visual, pressure pan, or duct blaster).
  - a) Visual: Record Good, Fair or Poor with respects to estimated visual leakage
  - b) Pressure Pan: Record the number of registers that have a reading at or higher than 3 pascals
  - c) Duct Blaster: Record the results of total leakage (in CFM25)

#### DUCT INSUALTION:

Heating distribution duct work must be insulated according to BPI standards. Duct work should be sealed according to BPI specifications.

#### HYDRONIC BOILERS:

Recommendations for new heating systems should be made if the existing system is in poor condition, improperly sized or creating a health risk that requires replacement. New installations must be in compliance with BPI standards for health & safety and proper sizing.

Heating distribution systems will be inspected and evaluated for each of the following: Location, Condition, and Insulation Levels.

1. Record the primary location of the heating distribution system.
2. Identify if the distribution system is insulated or not insulated.

#### PIPE INSUALTION:

Heating distribution pipe must be insulated according to BPI standards..

### **V. HEALTH & SAFETY INSPECTIONS:**

Following BPI procedures, carbon monoxide testing will be performed on all combustion appliances in the home. Additional testing will be performed on heating and domestic hot water equipment to evaluate spillage of combustion gases, drafting of appliances, and worst-case depressurization.

1. Record worst case CAZ depressurization.
2. Record results of spillage evaluation (pass/fail) for each vented appliance.
3. Record measured draft under worst case for each vented appliance.
4. Record carbon monoxide measurements for each appliance (including ovens).
5. If any of the above measurements cannot be made, document why.

### **A.)REPORT REQUIREMENTS & SPECIFICATIONS:**

Based on the results of the tests make recommendations for corrective action based on BPI standards including repair or replacement of appliances.

## **VI. BUILDING LEAKAGE TEST:**

A blower door test will be performed to determine the current air leakage rate of the building. The test will also be used to target the level and type of air sealing and/or mechanical ventilation required

1. Record the building leakage rate in CFM50.
2. Record existing type of mechanical ventilation (none, exhaust only, supply & exhaust ect.)
3. Record required mechanical ventilation in cfm.  
(Building airtightness standard already recorded when building measurements are taken.)
4. Identify primary and secondary air sealing locations based on inspection and blower door diagnostic tests (visual, blower door guided walkthrough, pressure diagnostics, smoke test, etc.)

### **A.) REPORT REQUIREMENTS & SPECIFICATIONS:**

#### **Air Sealing:**

Building Air Sealing: Recommendations for attic air sealing must be made when the building has any attic insulation or ventilation work recommended. In addition, air sealing is to be recommended on homes if the blower door diagnostic indicates primary leakage paths from the building shell to the exterior even if mechanical ventilation may be required before or after the work is performed. The Building Airtightness Standard (BAS) is designed as a guideline for determining when mechanical ventilation is required. The BAS should not be used to limit air sealing work when leakage paths from the building shell to the exterior are present. Refer to the BPI standards for guidance on prioritizing air sealing measures.

## **VII.) APPLIANCE AND LIGHTING MEASURES:**

Major appliances and lighting fixtures should be evaluated to determine if newer energy efficient models are beneficial.

1. Record existing refrigerator model number and age
2. Record existing high use lighting.
3. Identify recommended upgrades for appliances (refrigerator, dishwasher, clothes washer, etc.).

### **REPORT REQUIREMENTS & SPECIFICATIONS:**

#### **LIGHTING IMPROVEMENTS:**

Appropriate amounts of compact fluorescent bulbs shall be made with a minimum of 6 for each home. Evaluation of hardwire fluorescent fixtures should also be made where appropriate.

#### **APPLIANCE IMPROVEMENTS:**

Recommendations for Energy Star appliances should be made if they do not exist at the time of the visit. This includes Clothes Washers, Refrigerators and Dishwashers.

### **VIII.) EVALUATION & RECOMMENDATIONS REPORT:**

The Contractor will prepare a detailed report for the client that will list the results of the inspection and information on having the recommended improvements installed in the home. This report will list the individual measures along with cost and saving estimates. In the Comprehensive Home Assessment (CHA) all Health and Safety measures, as well as, measures with a predicted payback of seven years or less or a positive return on investment (ROI) must be presented. Information on low interest financing, participant incentives and loan applications will also be addressed for the client.

This document is designed as a guide when performing a comprehensive audit and may not address some of the issues encountered in the field. The required recommendations should be considered minimums for proposals and are not designed to limit or restrict the contractor's ability to install building performance measures desired by the customer. The Home Performance with Energy Star program standards and eligible measures will dictate which measures qualify for incentives and financing through the program. BPI standards should always be followed when conducting assessments, inspections, and diagnostics, making recommendations or proposals, and performing work.