

Home Performance (HP) Measures and Criteria

Air Sealing Methodology

- A. Criteria:
 - a. Blower door testing must be performed during the audit. Contractors must test in accordance with BPI standards outlined in “Technical Standards for Building Analyst I-Building Airflow” and the NYSERDA Materials and Installation Guidelines.
 - b. Air sealing strategies must be cost-effective, as measured by an accepted instrumented audit.
 - c. All air sealing measures must be consistent with the above guidelines.
- B. Procedures:
 - a. During the audit, the Contractor will conduct a blower door test and use pressure diagnostic techniques to identify major sources of infiltration.
 - b. The Contractor will make a list of specific air sealing tasks to be performed. These tasks are to be based on the current EmPower NY hourly rate. For example:
 - Air seal attic chases prior to insulation: \$XX
 - Seal holes in foundation: \$XX
 - Weather-strip three doors: \$XX
 - c. If the Contractor is required to obtain prior approval:
 - i. The list of air sealing tasks and costs must first be submitted to the Program Implementer, along with a projected goal for post air infiltration levels.
 - ii. The Program Implementer must then select and approve specific air sealing strategies.
 - iii. The Contractor may provide up to one hour of additional air sealing without prior approval if further leaks are discovered during work.
 - d. If the Contractor has been given authority to determine workscope without prior approval, the Contractor may proceed with air sealing provided that the estimated air leakage reduction meets the SIR goal of 1.1 or greater.
 - e. Upon completion of work, the Contractor must provide the Program Implementer with list of specific air sealing tasks completed and both pre- and post- air infiltration readings. Contractor must enter into CRIS the final blower door number in order to ensure accurate representation of savings.
 - f. If the Contractor does not provide appropriate air sealing as part of the workscope, written explanations must be provided to Program Implementer.

Insulation

- A. Criteria:
 - a. SIR of 1.1 or greater
 - b. No structural deficiencies exist (such as leaking roof) which would impede the effectiveness of the insulation. Such deficiencies must be corrected prior to insulation.
 - c. Structure is sound enough to support the weight of the insulation and installer(s).

- B. General Procedures:
- a. All insulation must be installed in a manner that is consistent with BPI Standards. Refer to “Technical Standards for Certified Shell Specialist” and “Technical Standards for Certified Building Analyst I” and the NYSERDA Materials and Installation Guidelines.
 - b. Whenever possible, material labels for material installed must be visibly attached to the structure in the area where they were installed.
 - c. Contractor must inspect premises for presence of knob and tube wiring and note location. If knob and tube insulation exists in the attic the Contractor may:
 - i. Propose removal of knob and tube in order to fully insulate attic; or
 - ii. Insulate attic, but ensure that no insulation is in direct contact with knob and tube wiring.
 - iii. If removal is proposed, the contractor must provide photographs of pre-existing knob and tube, and prior to installation, a detailed description of remediation. Prior approval of this proposal.
- C. Procedures specific to attic insulation:
- a. Contractor must ensure that insulation levels are sufficient to allow for any settling that may occur in an open blow. At the time of installation the installed insulation must be at least 1” higher than the invoiced level.
 - b. Stairway accesses to attics must receive wall insulation and stair tread high-density cellulose to ensure a complete thermal boundary. The access door must receive weather-stripping and a door sweep and must be secured against air leakage. The door must be insulated to a minimum of R-14.
 - c. If attic hatches exist or are installed in a dwelling, the contractor must weatherstrip and insulate the hatches **but not permanently seal**.
 - d. In the event that a contractor creates an access to the attic that must be permanently sealed (such as access through drywall, or situations where the contractor insulates the attic through a vent), the contractor must provide pre- and post-photos of the installed insulation.
 - e. In situations where objects stored in attic impede the Contractor’s ability to adequately insulate attic, the Contractor may require household to move objects within a given time frame. In rare instances, such as situations in which the household is disabled, the Contractor may propose a charge for moving objects to the Program Implementer, prior to installation. In other situations, additional resources from outside of the Program may be required.
 - f. When a floored attic exists, the Contractor must remove and replace flooring in a manner that provides minimum damage, and which provides access to all areas. Broken and split boards must be replaced with a like product and fastened appropriately. If a drill-and-plug method is used, plugs must be flush with existing surfaces.
 - g. In situations where the kneewalls are insulated, the Contractor must adequately block the thermal bypass at the attic floor/kneewall intersection. This may be achieved by rigid foam insulation caulked to fit, or dense-packed cellulose.
 - a. Ventilation must be installed in accordance with all applicable building codes and BPI standards. All openings must be sealed in a weathertight manner, and must not greatly detract from the aesthetics of the structure.
 - b. Vent opening shall be cut in such a manner as to allow maximum airflow through vent.

D. Procedures specific to sidewall insulation:

- a. Contractor must make every effort to determine the presence of pre-existing insulation. Acceptable methods include:
 - i. Probing outside of electrical outlets but inside outlet covers with a plastic knitting needle;
 - ii. Drilling holes on outside walls in areas such as closet walls, and spackling afterwards;
 - iii. Probing gaps or holes in interior surface of the exterior wall;
 - iv. Consulting with the occupant;
 - v. outlets or drilling holes;
 - vi. Pulling and checking under siding;
 - vii. Infrared scans.
- b. If pre-existing cellulose wall insulation is found and there is reason to believe that significant settling has occurred, re-insulation may be considered as follows:
 - i. Contractor must notify Program Implementer.
 - ii. An infrared scan must be used to identify extent of voids.
 - iii. Insulatable square footage must be documented.
 - iv. Contractor may then propose an adjusted wall price, based on higher labor cost/ft².
 - v. Program Implementer and Contractor must then calculate SIR; and proceed as appropriate.
- c. If pre-existing fiberglass wall insulation is found, Contractor must consult with Program Implementer. Additional insulation may only be installed with prior approval.
- d. When Insulating walls:
 - i. If pre-existing wall insulation is present, crew must accurately document location of added wall insulation. Notes and pictures regarding situation are recommended.
 - ii. Siding must be removed in all cases and reinstalled to match the original condition. Damaged siding must be repaired and replaced as necessary, and must be watertight. Unpaintable caulk is not acceptable for sealing replaced siding.
 - iii. Drilling directly into exterior siding, or drilling into the interior walls of the home is prohibited unless Contractor obtains written permission from both the Homeowner and the Program Implementer.
 - iv.

E. Procedures specific to miscellaneous insulation measures:

- a. Insulation of floors or crawlspaces with an SIR of 1.1 or greater may be acceptable measures provided that these measures:
 - i. Do not create the potential for freezing of pipes
 - ii. Are consistent with an appropriate thermal boundary for the home. Floor insulation between a warm basement and a heated space above, for example, is not appropriate.
 - iii. Address any air leakage issues with appropriate air sealing
- b. Floor insulation must be installed in such a manner that insulation is in contact with the sub-floor, with kraft or foil face applied towards the sub-floor. A minimum R-19 must be installed.

- c. Dirt-floor crawlspaces require a continuous air/moisture barrier. This may consist of plastic sheets of a minimum 4 ml, overlapped at least one foot. This barrier must extend at least 10-16" up the foundation wall.
- d. Exhaust fans that terminate into crawlspaces must be rerouted to the outside. Ductwork must be rigid.

Heating System Repair and Replacement

- A. Criteria for installation:
 - a. Heating system replacements will only be considered as a last resort in situations in which Program Implementer has documented attempts to obtain assistance from the HEAP Heating System Repair and Replacement (HERR) program, the Weatherization Assistance Program, and other appropriate funding sources have been rejected.
 - b. All heating system replacements, with the exception of no-heat emergencies, must have an SIR of 1.1 or greater. Heating system repairs, including clean and tunes, are not subject to this restriction.
 - c. Prior approval by Program Implementer has been obtained if the cost of a natural gas or propane Clean and Tune is greater than \$150, if an oil clean and tune exceeds \$250, and/or the overall repair cost to EmPower is greater than \$300.
 - d. Ownership by household has been established and written owner permission has been obtained.
 - e. If the household is a tenant, major heating system repairs or replacement is the responsibility of the landlord, and will not be covered by EmPower
- B. General Procedures:
 - a. All Contractors are expected to be familiar with, or to employ Subcontractors familiar with the wide variety of mechanical heating systems in use throughout New York State. The Building Performance Institute, the New York State Weatherization Directors' Association and other organizations provide training resources.
 - b. All work performed must comply with all State and local codes, and must be completed in accordance with BPI standards, as outlined in "Technical Standards for Certified Heating Specialists" and "Technical Standards for Building Analyst I". Any new heating system equipment must comply with the National Fire Protection Agency (NFPA), the National Fuel Gas Code (NFGC), and New York State Building construction codes.
 - c. All new heating systems must be ENERGY STAR® compliant unless, in an emergency situation, prior approval is obtained from the Program Implementer.
 - d. Contractor must discuss the heating system operation with an appropriate household member to:
 - i. Identify problems and concerns expressed by the household
 - ii. Educate the household on appropriate use and maintenance of the heating system.
 - e. Adjustments to the heating system that are deemed to be cost effective may be part of the inspection/servicing. Such measures may include replacement of a furnace filter, opening of restricted ductwork, bleeding an air-bound radiator, or adjustment of a gas burner.
 - f. Furnace filter slots must be covered. A magnetic tape strip or garage-door-type rubber gasket, secured with screws, may be acceptable options if they provide a reasonably tight seal.

- g. Contractor may not proceed with home performance measures unless the heating system is deemed to be in safe and operable condition.
 - h. Upon the completion of a combustion efficiency test, the Contractor must leave a tag on the heating system indicating test results and identifying tester, and document test results on EmPower audit paperwork.
 - i. Major repairs or replacement must be submitted to Program Implementer for prior approval. The Program Implementer may obtain second bids from alternative contractors.
 - j. Upon completion of any heating system work, which affects the efficiency of the heating system, another steady-state efficiency test must be performed. Final documentation, descriptions of specific repairs completed, and specific costs must be provided along with invoices.
 - k. Warranty, instruction manual and Contractor contact information must be provided to the household.
- C. Procedures related to Clean and Tunes:
- a. A Clean and Tune can be proposed when any of the following occur:
 - There is any evidence of smoke in a natural gas system’s flue gas; or
 - A smoke reading of #1 or greater in an oil system’s flue gas; or
 - CO levels are greater than 400 ppm or above manufacturer’s allowable limits in the air free flue gas; or
 - Evidence of flame roll-out in a natural gas heating system.
 - b. Technicians performing clean and tunes must complete of the Clean and Tune Checklist and Certification Form.
- D. Procedures related to secondary heating systems
- a. Contractor shall note the existence of all secondary heating systems on EmPower forms.
 - b. Contractor shall test where appropriate the steady state efficiency and CO of all such combustion units in a dwelling.
 - c. Contractor must consider the use of secondary heating systems in terms of their interconnectivity with other systems and the dwelling as a whole.
 - d. Contractor shall make note of any health and safety concerns present, such as use of an unvented kerosene heater, or close proximity between electric space heater and flammable objects. Such concerns shall be discussed with household and remedial action taken if necessary to ensure the safety of the household.

Inspection and Service to Water Heaters Fueled by a Fossil Fuel

- A. Criteria:
 - a. Water heater is fueled by natural gas, oil or propane
 - a. Replacement or repair is the only option to ensure that dwelling meets CAZ testing requirements. Prior to making this recommendation, contractor must first explore lower-cost alternatives. See Section 13 - Tips and Solutions to Solve Water Heater Venting Issues
 - b. Conditions in dwelling are appropriate for change-out. (i.e., no flooding in basement, adequate space etc.)
- B. Procedures:
 - b. Contractor must perform combustion efficiency and safety tests and safety checks on all gas, propane or oil-fired water heaters as required by BPI.

- c. Contractor shall consider options to reduce usage and ensure the health and safety of the occupants. These retrofits may include, but are not limited to:
 - i. Cleaning of burner assembly
 - ii. Repair or replacement of faulty venting system
 - iii. Repair of leaking hot water lines
 - iv. Repair or replacement of faulty fuel lines.
- d. All gas, propane, or oil domestic hot water systems must meet criteria as outlined in Section 7.8.

Programmable Thermostats

- A. Criteria for installation:
 - a. Participant owns the home.
 - b. Programmable thermostats may be installed on homes heated by electricity on any job, and on homes heated by a central fossil-fuel furnace or boiler on HP jobs.
 - c. Household displays the ability to properly understand and has a lifestyle that will effectively utilize the thermostat.
 - d. Thermostat voltage is appropriate.
 - e. Maximum one per zone
- B. Required thermostat specifications:
 - a. ENERGY STAR® labeled
 - b. In situations where home has a central air conditioning unit in use, thermostat has the capability to adjust cooling temperatures
 - c. Battery back-up
 - d. Large, easy to read display. In situations where household is visually impaired, Contractor must ensure that display is appropriate to household's needs.
 - e. A minimum of a 5/2-day program schedule (full 7 day program schedule is preferred)
 - f. Programming should be easy and intuitive, and must allow adequate time for inputs
 - g. Participant should be able to override program easily
 - h. Thermostat should include at minimum a full one-year warranty
 - i. Installed thermostats must be compatible with existing heating system
- C. Procedures for installation of thermostats for fossil-fuel systems:
 - a. Models must first be presented to Program Implementer and NYSERDA for review and approval.
 - b. Upon acceptance of model, thermostats may be installed during initial audit visit.
 - c. Installation must include training of an appropriate family member.
 - d. Contractor contact information must be left with the household in case questions arise.
 - e. Thermostat must be fully operational and programmed according to the family's needs before the Contractor leaves the home.
 - f. Replaced thermostats that contain mercury must be disposed of properly.
- D. Procedures regarding thermostats for electrically-heated homes:
 - a. Programmable thermostats may be installed in electrically-heated homes as part of an Electric Reduction or Home Performance work scope. These may be very effective at reducing electricity costs; however, electrically-heated homes often require thermostats in each room. Nevertheless, the cost may

be moderated by replacing only the thermostats in the areas that are most frequently used; a set of 3 to 5 “line-voltage” thermostats in these areas may be an appropriate and effective application. If such an opportunity arises, Contractor may consult with Program Implementer for guidance.

- b. Homes with electric heat pumps require a special thermostat which steps up the temperature slowly. Contractor may consult with Program Implementer regarding options.

Other Home Performance Measures

A. Criteria:

- a. SIR of 1.1 or greater, or demonstrated health and safety concern
- b. Prior approval of Program Implementer
- c. Consent of home owner

B. Procedures:

- a. Additional custom home-performance measures which may assist family may be proposed by Contractor.
- b. Photos documenting pre-existing conditions will be generally required.
- c. Whenever possible, cost-effectiveness must be assessed through the use of an instrumented audit tool and analysis of household energy usage patterns.
- d. Prior to installation, Contractor must receive prior approval from Program Implementer.