A/C or Heat Pump Field Guide

1/19/2016

Standards of Reference:
ANSI/BPI-1200-S-2015 Standard Practice for Basic Analysis of Buildings
Technical Standards for the AC & Heat Pump Professional

2 **Register Airflow Testing**

Candidate properly setup for a register airflow test
Candidate correctly and accurately measured airflow to registers

2 **System Airflow**

Proper setup for a system airflow test (flow plate or duct pressurization device)
Proper set-up of the manometer

3 **Refrigerant Charge Testing**

Candidate measured wet and dry bulb temperature in return plenum
Mixed dry bulb temperature in the supply plenum checking for warm or cool spots
Candidate properly measured dry bulb entering the condenser coil
Candidate correctly identified metering device
Candidate correctly identified proper method for checking charge
Liquid/suction line temperature taken correctly (system dependent)
Candidate correctly calculated target superheat / subcooling
Candidate properly hooked up gauges
Recorded high side pressure and corresponding saturation temperature
for the refrigerant in the system (from gauges)
Recorded low side pressure and corresponding saturation temperature
for the refrigerant in the system (from gauges)
Candidate identified actual superheat / subcooling
Identified whether undercharged or overcharged based on results

3 **Combustion Safety Tests**

Correctly identified heating / cooling system types
Visual inspection of venting system for problems - NON-SCORABLE
Determined condition accurately
Correctly set up for natural conditions
Correctly recorded pressure differential in the CAZ prior to turning on exhaust appliances
Correctly setup home in worst case condition - NON-SCORABLE
All exhaust appliances running
Correct door closures - measured quantitatively or qualitatively
Air handler operation impact checked
Correctly checked for worst case spillage in heating system
Correctly determined if the appliance passes the spillage test
Correctly checked for worst case spillage in the domestic water heater
Correctly determined if the appliance passes the spillage test

3 **CO Testing**

Correctly prepared CO monitor for use while outside of the building
Correctly tested ambient CO indoors
Correctly measured heating system flue gas CO during combustion safety testing
Correctly measured DHW flue gas CO during combustion safety testing
Appropriately applied BPI action levels based on test results for CO in the flue (choose DHW or heating system)
Correctly monitored ambient CO levels in the CAZ during entire combustion safety tests
Tested for CO in oven - NON-SCORABLE
Correctly checked for items, excessive debris inside oven
Oven test sampling location appropriate

2 **Duct system inspection**

Properly identified supplies and returns
Indicated the need to check condition of filter
Identified areas of significant leakage
Determined duct insulation needs
Made appropriate recommendations on insulation levels based on BPI standards Mentioned
need for additional testing of the duct system

3 **Infiltration Evaluation**

Combustion appliances set to pilot or disabled
Proper set-up of the blower door frame/shroud/fan
Proper set-up of the manometer
Proper house set-up for testing
Correctly measured baseline pressure differential
Accurate CFM50 measurement
Measured existing ventilation fan flow
Discussed ventilation needs in relation to existing fans
Conducted sample room by room inspection with blower door running
Recommended air sealing appropriately
Mentioned: Top plates and penetration through top and bottom floor
Recommended mechanical ventilation appropriately
Mentioned need for further pressure differential testing as appropriate

5 **General home investigation**

Determined insulation levels and effectiveness in attics / knee walls
Determined insulation levels and effectiveness in basements / crawlspaces
Discussed methodology used to determine the insulation levels within the exterior walls
Identified bypasses low and high in the building
Identified areas of potential bypasses
Identified air barrier/thermal boundary alignment issues
Inspected doors for fit and performance
Inspected windows for fit and performance
Discussed heat loss / savings potentials and understands implications
Indicated areas of heat loss, discussed benefits of adding insulation / airsealing, etc
Discussed fossil fuel/electric consumption based on initial observations
Inefficient heating /cooling / DHW equipment, water consumption, electrical use, etc
Identified need for utility usage review
Identified moisture problems and made appropriate recommendations Identified
IAQ problems and made appropriate recommendations
e.g. exposed fiber glass in occupied spaces, etc
Identified fire hazards and/or VOC pollutants

Identified major electric appliance upgrade opportunities
Identified significant lighting upgrade opportunities
Mentioned: CFL's, motion switches, etc
Discussed methods for verifying electrical efficiency improvements
Discussed important fuel-switching opportunities (including use of renewable energy)
Use of less expensive fuels, possibility of renewable sources, etc
Identified the need for low flow water consuming devices
Mentioned: aerators, low flow toilets, etc

5 **Heat Loss / Load Calculation**

Discussed proper sizing of heating/cooling system based on loss/load calculations
Accurately identified conservation measures that could impact sizing
Identified distribution system issues relating to these calculations
Understands relationship between calculations, current usage and proposed savings

3 **DHW Inspection**

Correctly identified DHW type
Checked condition of basic safety controls
Discussed appliance condition
Identified additional DHW energy-saving measures as appropriate
e.g. lowering temperature, tank insulation, pipe insulation, tank upgrade, timer, etc