Significant Changes to the IHWAP Field Guide – 2021

July 1, 2021

Section 100 – Diagnostics

Section 1111 House Set-Up

Defined "winter" and "as found" conditions.

Winter condition means that all windows and exterior doors are closed. "As found" means that holes found in the thermal boundary should not be sealed for the blower door test.

Section 11111 Basements and Crawl Spaces

Added the following language:

Crawl spaces are often included within the thermal boundary of the home. However, access hatches from the house to the crawl space should remain closed during the blower door test as the crawl space is non-occupiable space.

Section 112 ASHRAE 62.2-2016

Deleted the following language and Table 100-2.

- ~~Whole house continuous ventilation may be required (includes apartments)~~
- ~~Required base ventilation is determined by house size and number of bedrooms (Table 100-2) or by number of people living in the home (occupancy)~~
- ~~Required ventilation must be increased if bathroom and kitchen exhaust fans are not existing or existing exhaust flow rates are insufficient~~
- ~~Required ventilation may be reduced based on flow rates of existing bathroom and kitchen exhaust fans (fans must be measured to get full credit)~~
- ~~Required ventilation may be reduced based on the air leakage rate of home as determined by a blower door test~~

Floor Area (ft^2)	Bedrooms				
	1	2	3	4	5
<500	30	37.5	45	52.5	60
501 - 1000	45	52.5	60	67.5	75
1001 - 1500	60	67.5	75	82.5	90
1501 - 2000	75	82.5	90	97.5	105
2001- 2500	90	97.5	105	112.5	120
2501 - 3000	105	112.5	120	127.5	135
3001 - 3500	120	127.5	135	142.5	150
3501 - 4000	135	142.5	150	157.5	165
4001 - 4500	150	157.5	165	172.5	180
4501 - 5000	165	172.5	180	187.5	195
5001 - 5500	180	187.5	195	202.5	110
5501 - 6000	195	202.5	210	217.5	225
6001 - 6500	210	217.5	225	232.5	240
6501 - 7000	225	232.5	240	247.5	255
7001 - 7500	240	247.5	255	262.5	270
> 7500	255	262.5	270	277.5	285

Section 1131 Zone to Outside Readings
Modified the following language:

- Zone-to-outside readings of 0 to -25 Pa indicate that the zone is more "outside". ~~air barrier between the living space and zone is tighter than the boundary between the zone and outside (for example, the ceiling is tighter than the roof in an unfinished attic). However, the air barrier (ceiling) should be made tighter if the pressure reading is more negative than -5 Pa.~~
- Zone-to-outside readings of -25 Pa to -50 Pa indicate that the zone is more inside".~~air barrier between the zone and outside is tighter than the air barrier between the living space and zone. For example, the crawl space foundation walls are tighter than the floor between the crawl space and conditioned area. If the crawl space foundation walls are the thermal boundary, holes in the foundation wall should be sealed until the pressure difference between the crawl space and outside is more negative than -45 Pa.~~
- Zone-to-outside readings around -25 Pa indicate that the air zone is in the "middle".~~barrier between the zone and conditioned space and the air barrier between the zone and outside are equally leaky.~~

Section 114 Pressure-Pan Duct Test
Added the following language:

- Pressure pan testing is not required if the ductwork is being brought into the thermal boundary (ducts in a vented crawl space where the thermal boundary will become the foundation walls, for example).
- Pressure-pan testing is not required on ducts located in conditioned spaces.

Section 1141 Pressure-Pan Procedures
Modified the language.

- Install blower door and set-up house for winter conditions. Open all interior doors (see section 1111, "House Set-Up").
- Clear Baseline!
- Turn furnace off. Remove furnace filter and tape filter slot. ~~Ensure that all grilles, registers and dampers are fully open. If the pressure pan test is being done on a house with ducts in an unconditioned space, seal supply and return air registers in the unconditioned space with tape. If the test is being done on return ducts in a basement, only seal supply registers in the basement but leave return grilles open.~~
- Temporarily seal any outside fresh-air intakes to the duct system.
- ~~Open attics, crawl spaces that are intended to be outside of the pressure boundary (e.g. vented crawl spaces with insulation under the floor of the house), and garages as much as possible to the outside.~~
- Close door to basement if testing ducts in basements. If possible, open a basement window or basement door to the outside. ~~Tape the bottom of the basement door to further isolate the basement from the living space if necessary.~~
- ~~If using DG700 manometer, turn off to eliminate the "Adjusted Baseline Reading" from the blower door test as noted above. Turn manometer back on; do not establish a new baseline reading.~~

- Connect a hose between the pressure-pan and the input tap on the ~~digital~~ manometer. Leave the reference tap open.
- With the blower door at -50 Pa, place the pressure-pan completely over a grille or register to form a tight seal. Record the reading. **Note that only one register is sealed at a time**.

If a grille is too large or a supply register is difficult to access (under a kitchen cabinet, for example) or a pressure pan is not available, seal the grille or register with duct-mask tape (Figure 1141-1). Grille can also be partially sealed with duct-mask tape and used with the pressure pan (Figure XXX). ~~or duct tape (Figure 1141-2).~~ Insert a pressure probe through the duct-mask tape and record reading. Remove tape following reading.

Section 115 ~~Duct-Induced~~Room-to Room Pressure Test

Changed name of test and added the following language:

This is not a required test but can assist in solving spillage, comfort and indoor air quality problems. The test can determine if an imbalance between the supply and return ductwork exists, especially in homes with central return systems.

Section 1153 Interpreting Room-to-Room Pressures

Deleted the following language.

~~Transfer areas and ducts are sized based on the equation shown below. If grilles are being installed to correct room pressures, assume that the free ventilation area of the grille is no more than 80% of its total area. To calculate the finished grille size, divide the transfer area – A – by 0.8.~~

~~A = Q/1.853~~

~~where:~~

~~*A* = area in square inches~~

~~*Q* = air flow rate (ft3/min)~~

~~For example, a bedroom supply register has a flow rate of 100 CFM. The free area required for return air is 54 in^2 (100/1.853 = 54). If a transfer grille is to be installed between the bedroom and hallway, the area of the grille should be at least 68 in^2 (54/0.8 = 68).~~

Section 1161 Exhaust Fan Flow Meter Procedures

Modified the language as shown below. The procedure on how to do the test was deleted.

Air flow though the flow meter is measured in CFM with the manometer. The measured air flow can be used in the following manner.

- Determine flow rates of existing bathroom fans. Measured flow rates can be compared to rated flow rate of fans to determine the effectiveness of the fans.
- Adjust flow rate on variable speed fans to meet the required ASHRAE ventilation rate.

Refer to manometer instructions for setting-up the manometer for using the flow hood.

- ~~Press the MODE button once. Pressure (Pa) will displayed on the A channel and flow (CFM) will be displayed on the B channel.~~
- ~~Press the DEVICE button five times until EXH is displayed above the A channel display. EXH is the acronym for Exhaust Fan Flow Hood.~~
- ~~Press the CONFIG button once. B2 will be shown above the B channel display. Be sure the opening on the flow hood is open to the E2 position.~~
- ~~Connect both input taps using a bridge hose. Connect another hose from the T-connector to the exhaust fan flow hood (Figure 1161-1).~~
- ~~Make sure the door opening on flow meter is set to E2.~~

- ~~Place flow meter completely over fan forming an air-tight seal (flow meter will not work for kitchen exhaust hoods).~~
- ~~Turn on exhaust fan. After 10 seconds, read both Pressure (A channel) and "Flow" (B channel) readings on manometer.~~
- ~~Ensure readings by comparing them to those on the side of the flow hood.~~
- ~~If pressure reading (A channel) on manometer is greater than 8.0 Pa, select a larger opening on the flow meter. If E1 is already being used (the largest opening), the fan exhaust is outside the upper range of the flow meter (124 CFM).~~
- ~~If the flow reading (B channel) on the manometer reads "LO", select a smaller opening on the flow meter. If E3 is already being used (the smallest opening), the fan exhaust is below the lower range of the flow meter (10 CFM).~~
- ~~When changing the opening on the flow hood, be sure to change the configuration on the manometer using the CONFIG button~~.

Section 117 Spillage Test-Out

Added the following language:

It is highly recommended that contractors conduct this test prior to beginning weatherization work in homes that measure 2500 CFM or less to ensure that a spillage problem doesn't currently exist.

Modified the procedure as shown below.

1. Close all windows and exterior doors.
2. Close fireplace damper.
3. Interior doors
   a. Close all interior doors, including door to combustion appliance zone (CAZ)[1].
   b. ~~Leave~~ Open doors to rooms ~~open~~:
      i. with exhaust fans, such as bathrooms and kitchens
      ii. with ducted returns.
4. Close or seal supply air ducts in the CAZ. Leave return registers in the CAZ open.
5. Exhaust
   a. Turn on clothes dryer.
   b. Turn on all exhaust fans, such as bathroom and kitchen exhaust fans, such that they operate at maximum speed.
   c. Do not turn on whole house fans.
6. Turn on furnace air handler.
7. Spillage
   a. Turn-on natural draft appliance.
   b. Test for spillage at the draft diverter or draft hood with a mirror or smoke pencil.
8. ~~Check for spillage~~Time limits[2] –

a. ***Natural Draft Water Heaters*** -
Spillage must cease (water heater begins drafting) within two minutes. If water heater begins drafting within two minutes, the water heater passes the test (Figure 117-1).

b. ***Natural Draft Furnaces - Warm Vent*** (when furnace thermostat is on heat) –
Spillage must cease (furnace begins drafting) within two minutes. If furnace begins drafting within two minutes, the furnace passes the test.

c. ***Natural Draft Furnaces - Cold Vent*** (when furnace thermostat is not on heat) –

[1] CAZ is the space in which the natural draft appliance is located.
[2] ANSI/BPI-1200-S-2017, "Standard Practice for Basic Analysis of Buildings", sections 7.9.2 and 7.9.3

Spillage must cease (furnace begins drafting) within five minutes. If furnace begins drafting within five minutes, the furnace passes the test.