# Appendix A – Field Observations

* *Home ID:* \_\_\_\_\_\_\_\_\_
* *Story where the apartment is located:* \_\_\_\_\_\_\_\_\_
* *Date (YYYY-MM-DD):* \_\_\_\_\_\_\_\_\_\_

## General house characteristics

*Type of structure:* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* + E: End unit, attached one side
  + M: Middle unit, attached both sides
  + B: Bottom flat of duplex
  + T: Top flat of duplex
  + A: Apartment unit

*Number of stories above ground:* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   
(1 = 1-story, 1.5 = split-level, etc.)

Floor area (ft2): \_\_\_\_\_\_\_\_\_

How was floor area determined?

* P: based on data provided by building performance program
* R: based on official records (via any source)
* W: provided by owner
* O: Other: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Average ceiling height* (ft): \_\_\_\_\_\_\_\_

*Number of bedrooms:* \_\_\_\_\_\_\_

(Official number of bedrooms from property records; do NOT include office or den)

*Number of full bathrooms:* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   
(Number of bathrooms with shower or bathtub)

*Number of half bathrooms:* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   
(Number bathrooms with toilet but no bath or shower)

*Garage (GAR):* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* + A: Attached
  + D: Detached
  + U: Underground
  + N: None

*Foundation type?* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (select all)

* + S: Slab-on-grade
  + C: Crawlspace
  + B: Basement
  + U: Underground garage
  + O: Other: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (e.g. raised piers)

*Roof type*: \_\_\_\_\_\_\_

* + P: Pitched
  + F: Flat
  + O: Other: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Roofing material: \_\_\_\_\_\_\_\_\_\_\_\_\_\_

* + CS: Composite shingle
  + WS: Wood shingle
  + MT: Metal
  + CL: Clay tiles
  + CS: Synthetic clay
  + SS: Synthetic slate
  + SL: Natural slate
  + OT: Other : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + UN: Unable to determine

*Roof overhang (not including rain gutters, inches)*: \_\_\_\_\_\_\_\_\_\_\_

*Gutters installed? (Y/N) \_\_\_\_\_\_\_\_\_\_\_\_\_*

Proper drainage and grading? (Y/N) *\_\_\_\_\_\_\_\_\_\_\_\_\_*

If No, identify issues that may lead to moisture problems:

* + G: Improper grading
  + U: Improperly installed gutters
  + D: Disconnected downspouts
  + C: Downspouts draining too close to house
  + O: Other: *\_\_\_\_\_\_\_\_\_\_\_\_\_*

*Solar PV:* \_\_\_\_\_\_ (Yes / No)

*Locations of sliding doors to outside (Use room codes or NA for none):*

* Sliding door 1 location: \_\_\_\_\_\_
* Sliding door 2 location: \_\_\_\_\_\_
* Sliding door 3 location: \_\_\_\_\_\_

*Master bedroom*

* Room square footage: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (ft2)
* Room ceiling height: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (ft)
* Presence of any of the following pressure balancing feature(s):
* Door undercut \_\_\_\_\_\_ (Y / N)
* Ducted return inside master bedroom \_\_\_\_\_\_ (Y / N)
* Transfer grille \_\_\_\_\_\_ (Y / N)
* Jump duct \_\_\_\_\_\_ (Y /N)

## Participant Understanding of whole-house ventilation system

### *Home does NOT have whole-house ventilation system [ ] 🡪 Skip 1.2*

*Next few questions are about* ***participant’s understanding*** *of their home’s whole house ventilation system (which could be inaccurate); it is not about the actual system (which is described separately).*

*1. Do they think that they have a ventilation system?* \_\_\_\_

* + Y: Yes
  + N: No
  + U: Unsure

*2. If they think there is a ventilation system, do they know if the system is operating currently?* \_\_\_\_

* + Y: WHV is operating currently
    - N: WHV is turned off
    - U: Unsure if WHV is operating or not
    - NA: House does not have WHV

*3. If they think there is a ventilation system, do they know where is the switch or controller* f*or the system?* \_\_\_\_

* + Y: Yes
  + N: No
  + U: Unsure
  + X: WHV does not have a switch or controller
  + NA: House does not have WHV

*4. If they think there is a ventilation system, do they know how is the system controlled?* \_\_\_\_

* + S: On/off switch
  + T: Thermostat
  + C: Ventilation controller / timer that is separate from thermostat
  + O: On all the time
  + U: Unsure
  + NA: House does not have WHV

*5. If they think the ventilation system runs on a timer, do they know how to set the timer?* \_\_\_\_

* + Y: Yes
  + N: No
  + U: Unsure
  + X: WHV does not runs on a timer
  + NA: House does not have WHV

*6. If they think the system is off, who turned it off?* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* + P: Participant
  + O: Other occupant
  + B: Builder
  + C: HVAC Contractor
  + U: Unsure
  + R: WHV currently operating
  + NA: House does not have WHV

*7. If they think system is off, why is it off?* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (list all)

* + D: Default; has always been off since they lived in house
  + U: Unsure, no specific reason
  + X: Not needed
  + E: Save energy
  + N: Too noisy
  + C: Winter Comfort – ventilation system contributes to house being cold
  + H: Summer comfort – ventilation system contributes to house being hot
  + O: Bad outdoor air quality
  + NA: House does not have WHV

*8. If occupant turned off the system by choice, is WHV ever used since they lived in house?* \_\_\_\_\_\_\_\_\_

* + Y: Yes, WHV is used sometimes
  + N: No, never
  + U: Unsure
  + R: WHV currently operating
  + NA: House does not have WHV

## Identify the whole-house ventilation (WHV) system

### *Home does NOT have whole-house ventilation system [ ] 🡪 Skip 1.3*

*62.2 required WHV airflow:* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (CFM)

Calculation included infiltration credit? \_\_\_\_\_\_\_\_\_ (Y / N)

WHV fan capacity: \_\_\_\_\_\_\_\_\_ (CFM)

WHV fan runtime per hour: \_\_\_\_\_\_\_\_\_ (minutes)

Method used to measure WHV airflow: \_\_\_\_\_\_\_\_\_

* + EXF: Exhaust Fan Meter
  + PFL: Power flow hood
  + VPR: Velocity probe
  + TRG: Tracer gas
  + OTH: Other: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*WHV system type:* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* + EX: Exhaust
  + SU: Supply with inline fan
  + FA: Fresh air vent connected to AHU (no separate inline fan)
  + HI: HRV with independent ducts (standalone)
  + HA: HRV integrated into central forced air heating/cooling
  + EI: ERV with independent ducts (standalone)
  + EA: ERV integrated into central forced air heating/cooling
  + OT: Other[[1]](#footnote-1) : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*WHV system control:* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* + C: Continuous operation
  + I: Intermittently controlled by a timer (Includes AirCycler™)
  + T: Thermostat schedule (linked to air handler)

*Is the WHV system operating on 1st visit?* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* Y: Yes
* N: No
* P: Partial
* U: Unclear

If P or U, please explain: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Is the WHV system controller labeled?* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (Y / N)

(Take photo of label)

Changes to WHV during 1st monitoring week? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (Y / N)

If yes, describe: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Changes to WHV during 2nd monitoring week? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (Y / N; or NA)

If yes, describe: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

### Exhaust WHV

### *Home does NOT have Exhaust WHV [ ] 🡪 Skip 1.3.1*

Exhaust fan 1 location in home: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (Room codes)

Exhaust fan 2 location in home: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Exhaust fan 3 location in home: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Presence of any of the following feature(s) for connecting WHV exhaust fan with rest of the home: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* + - T: Transfer grille
    - J: Jump duct
    - U: Door undercut
    - NA: WHV exhaust fan not located in a closed room
    - X: None

### Supply WHV

### *Home does NOT have Supply WHV [ ] 🡪 Skip 1.3.2*

*Location of outdoor air intake*: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* + - G: Gable
    - S: Soffit
    - R: Roof
    - W: House wall
    - O: Other: *\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

*Supply connection to AHU (or ductwork):* \_\_\_\_\_\_\_\_

* S: Supply side of AHU
* R: Return side of AHU
* B: Both sides of AHU
* N: Not connected to AHU or ductwork

*If not connected to AHU, locations of supply vents (text):* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Room codes; NA if connected to AHU)

*Control damper?* \_\_\_\_\_\_\_\_

* F: Fixed position (set manually)
* M: Motorized
* P: Passive
* N: None

*If there is an air filter for the inline supply fan that is separate from the AHU filter?*

* Y: Yes
* N: No

*Air filter slot dimensions (in) (if filter undersized to slot, note in “problems”):*

* Air Filter Length: \_\_\_\_\_\_
* Air Filter Width: \_\_\_\_\_\_
* Air Filter Depth: \_\_\_\_\_\_

*Does air filter slot have a seal?* \_\_\_\_\_ (Y / N)

*Air filter brand:* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  *(3M, AAF, etc.)*

*Air filter rating:* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ *(MERV8, FPR10, MPR300, etc.)*

*Air filter condition (see below):* \_\_\_\_\_\_\_

* 0: Like new
* 1: Lightly used (light dust on filter)
* 2: Moderately used (dust covered filter)
* 3: Heavily used (layers of dust on filter)

*Air filter months in use:* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Enter number, decimal places okay. Enter “X” if it cannot be determined)

*Method used to determine air filter months in use*: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* OF: Install date written on filter
* PR: Participant recall
* SS: Subscription service
* RE: Other reminder (thermostat, phone app, etc.)
* OT: Other: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* X: Don’t know

*Problems with air filter installation:* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* N: None, filter installed properly
* U: Filter undersized (note filter size below)
* C: Filter crushed to fit into slot
* B: Filter installed backward
* X: Filter missing
* O: Other installation problem: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

### ERV or HRV

### *Home does NOT have ERV/HRV [ ] 🡪 Skip 1.3.3*

*(Note: Balanced could be a supply fan and an exhaust fan. For that scenario, record data for supply and exhaust fan sections. This section is just for HRV / ERV.)*

*Enter ERV or HRV:* \_\_\_\_\_\_

*Location of ERV / HRV unit*: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Location code)

*Location of outdoor air intake:* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* G: Gable end
* R: Roof
* S: Soffit
* W: House wall
* O: Other: *\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

*ERV / HRV connection to AHU:* \_\_\_\_\_\_\_\_

* S: Supply side of AHU
* R: Return side of AHU
* B: Both sides of AHU
* N: Not connected to AHU

*If not connected to AHU, locations of supply vents*: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (list all)

(Room codes; NA if connected to AHU)

*If not connected to AHU, locations of exhaust vents*: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (list all)

(Room codes; NA if connected to AHU)

*Control damper?* \_\_\_\_\_\_\_\_

* F: Fixed position (set manually)
* M: Motorized
* P: Passive
* N: None

*Is there is an air filter for the ERV/HRV that is separate from the AHU filter?*

* Y: Yes
* N: No

*Air filter slot dimensions (in) (if filter undersized to slot, note in “problems”):*

* Air Filter Length: \_\_\_\_\_\_
* Air Filter Width: \_\_\_\_\_\_
* Air Filter Depth: \_\_\_\_\_\_

*Does air filter slot have a seal?* \_\_\_\_\_ (Y / N)

*Air filter brand:* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ *(3M, AAF, etc.)*

*Air filter rating:* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ *(MERV8, FPR10, MPR300, etc.)*

*Air filter condition (see below):* \_\_\_\_\_\_\_

* 0: Like new
* 1: Lightly used (light dust on filter)
* 2: Moderately used (dust covered filter)
* 3: Heavily used (layers of dust on filter)

*Air filter months in use:* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Enter number, decimal places okay. Enter “X” if it cannot be determined)

*Method used to determine air filter months in use*: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* OF: Install date written on filter
* PR: Participant recall
* SS: Subscription service
* RE: Other reminder (thermostat, phone app, etc.)
* OT: Other: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* X: Don’t know

*Problems with air filter installation:* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* N: None, filter installed properly
* U: Filter undersized (note filter size below)
* C: Filter crushed to fit into slot
* B: Filter installed backward
* X: Filter missing
* O: Other installation problem : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

## Other mechanical equipment and appliances

### Kitchen

*Cooktop type:* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* + C: Counter
  + I: Island
  + R: Range (single appliance with cooktop and oven)

*Cooktop heating element:* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* + C: Electric – open coils
  + L: Electric – coils under glass
  + I: Electric – induction
  + G: Natural gas
  + P: Propane

*First oven heating element:* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* + E: Electric
  + G: Natural gas
  + P: Propane

*Second oven heating element:* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* + G: Natural gas
  + E: Electric
  + P: Propane
  + N: Not applicable, no second oven

*Additional cooking equipment on counters - text entries.*

(Examples: toaster, toaster oven, griddle, deep fryer, hot plate)

* + Device 1: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Device 2: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Device 3: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Device 4: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Device 5: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

### Range Hood (RHD), Over the Range Microwave (OTR), or Downdraft (DWD)

Is there a RHD above cooktop? \_\_\_\_ (Y / N)

If Yes, is RHD ducted to outside? \_\_\_\_ (Y / N / Unclear)

Is there a OTR microwave above cooktop? \_\_\_\_ (Y / N)

If Yes, is OTR ducted to outside? \_\_\_\_ (Y / N / Unclear)

Is there a DWD exhaust system? \_\_\_\_\_\_ (Y / N)

If Yes, is DWD ducted to outside? \_\_\_\_ (Y / N / Unclear)

Is there another exhaust fan in kitchen (including ERV exhaust)? \_\_\_\_ (Y / N)

Where does the vent exit from the house? \_\_\_\_\_

* + R: Roof
  + S: Side
  + O: Other: \_\_\_\_\_\_\_\_\_\_\_

*Brand:* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (Whirlpool, GE, etc.)

*Model:* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Mount type?* \_\_\_\_

* + U: Under-cabinet
  + W: Wall (>6” space between hood and cabinets or no cabinets at sides)
  + I: Island
  + D: Downdraft

For under-cabinet and wall, mount, it is ducted vertically or horizontally? \_\_\_\_

* H: horizontally
* V: Vertically

*Horizontal plane dimensions of RHD or OTR (in):*

* Width:\_\_\_\_\_\_
* Depth: \_\_\_\_\_

*Height of lower edge of RHD or OTR above cooking surface (in):*

(Note: for gas burners cooking surface is grate, not base of burner; for electric coils it is the top of the coils)

* Height:\_\_\_\_\_\_

*Percent of cooktop depth covered by RHD or OTR (%):* \_\_\_\_\_\_

*Percent of cooktop width covered by RHD or OTR (%):* \_\_\_\_\_\_\_\_\_

*Grease screen condition (5 point scale):* \_\_\_\_\_

* + 0: Like new
  + 1: Light oil coating
  + 2: Oil buildup
  + 3: Thick oil + some dust (problematic)
  + 4: Fuzzy (failure)

*Is Grease screen installed correctly?* \_\_\_\_\_\_\_\_\_\_ (Y / N / Unclear)

### (Separate) Kitchen Exhaust Fan (KIT)

*Brand:* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (AirKing, Broan, Delta, NuTone, etc.)

*Model:* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Is kitchen exhaust fan part of ERV, HRV, or other WHV system:* \_\_\_\_\_\_\_\_

(Y / N)

*How is fan controlled?:* \_\_\_\_\_\_\_\_

* + C: Continuous, no boost
  + T: Timer
  + B: Continuous with **B**oost (by switch)
  + S: Switch for on/off operation

*Automatic (continuous or timer) airflow, rated (cfm):* \_\_\_\_\_\_\_\_

(Enter 999 if it cannot be determined)

*On/off or boost mode rated airflow (cfm):* \_\_\_\_\_\_\_

(Enter 999 if it cannot be determined; Enter 0 if there is no boost mode)

*Is on/off or boost mode switch accessible while standing at cooktop?* \_\_\_\_\_\_\_\_ (Y / N)

*Is on/off or boost mode switch labeled?* \_\_\_\_\_\_\_\_ (Y / N)

### Master Bathroom

*Number of Exhaust Fans:* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (#; enter 0 if none)

*Separate toilet room?* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (Y / N)

Operable window? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (Y / N)

**Main Area (BA1) exhaust fan**

* + - Brand: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    - Model: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*BA1 rated high-speed airflow:* \_\_\_\_\_\_\_ (CFM)

(NA if no exhaust fan, 999 = cannot be determined)

Note: if bath fan is the WHV, low-speed will already have been measured.

*BA1 control* (for high flow; list all, separated by commas)*:* \_\_\_\_\_

* + - L: Always on when light is on
    - S: On/off by wall switch
    - H: Humidistat
    - T: Timer controlled by occupant
    - O: Occupancy sensor

(Note: connection to WHV noted elsewhere)

*Enter setting for BA1 humidistat (% of highest value available or %RH): \_\_\_\_\_*

*Shut off delay (minutes):* \_\_\_\_\_\_

(Enter 999 if cannot be determined)

*If BA1 has occupancy sensor, note shut off delay (minutes):* \_\_\_\_\_\_

(Enter 999 if cannot be determined)

**Exhaust fan in Main Shower Area (SW1)**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Repeat same data collection as for BA1)

**Exhaust fan in Main Toilet Room (TO1)**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Repeat same data collection as for BA1)

Repeat for **Other Bathrooms BA2, BA3, BA4, BA5, Laundry Room (LAU)**

(Repeat same data collection as for BA1)

## Heating / Cooling and Air Handler Units (AH#)

*Heating equipment:* \_\_\_\_\_\_\_

(list all, separated by commas)

* + CG: Central furnace with forced air, gas
  + CE: Central furnace with forced air, electric
  + CH: Central Heat pump with forced air
  + MU: Mini-split heat pump, Ductless
  + MD: Mini-split heat pump, Ducted
  + CB: Central gas boiler with radiators
  + BE: Baseboard electric in rooms
  + UF: Under Floor (hot water)
  + WG: wall furnace, gas, vented
  + FG: Fireplace, gas, vented
  + FX: Fireplace, gas, unvented
  + FW: Fireplace, wood
  + XX: Freestanding gas heater, unvented
  + XE: Freestanding electric heater
  + XK: Freestanding kerosene heater
  + WS: Wood or pellet stove
  + OT: Other heating equipment: \_\_\_\_\_\_\_\_\_

*Cooling equipment*: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(list all, separated by commas)

* + CE: Central AC via forced air
  + CH: Central heat pump via forced air
  + MU: Mini-split heat pump, Ductless
  + MD: Mini-split heat pump, Ducted
  + WA: Window or room AC
  + EC: Evaporative cooler
  + HF: Whole-house fan
  + CF: Ceiling fan
  + PF: Portable fan
  + OT: Other: \_\_\_\_\_\_\_\_\_

*How many air handling units?* \_\_\_\_\_\_\_\_ (#; NA = no forced air system)

*Location of AH1*: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* + A: Attic
  + B: Basement
  + C: Interior closet or utility room
  + G: Garage including utility room[[2]](#footnote-2)
  + C: Closet
  + R: Roof
  + O: Other: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*AH1 rated airflow, maximum (CFM):* \_\_\_\_\_\_\_\_\_

*AH1 rated airflow, minimum (CFM):* \_\_\_\_\_\_\_\_

*How many zones for AH1?* \_\_\_\_\_\_\_\_ (#, NA = no forced air system)

*List rooms (or floor number if entire floor) included in each zone:*

* Zone 1 rooms: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Zone 2 rooms: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*How many return grilles?* \_\_\_\_\_\_\_\_\_\_\_\_\_ (#)

Enter room/location codes for each return grille and height (**L**ow-wall, **H**igh-wall, **C**eiling)

* Zone 1 return grille 1 (Z1G1) location: \_\_\_\_\_\_\_ (room code)
* Z1G1 height: \_\_\_\_\_\_\_ (L / H / C)
* Zone 1 return grille 2 (Z1G2) location: \_\_\_\_\_\_\_ (room code)
* Z1G2 height: \_\_\_\_\_\_\_ (L / H / C)

*Location of ductwork for AH1 (select all that apply)*

* 0: All in conditioned space
* 1: Some in garage
* 2: Some in unconditioned attic
* 3: Some in unconditioned crawl space

*Duct insulation for AH1:* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 0: Under insulated
* 1: Average (R4)
* 2: Above average (R6/R8)
* 3: Ducts buried
* 9: Ducts inside conditioned space

*Any other IEQ equipment integrated with AHU:* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* + D: Dehumidifier
  + H: Humidifier
  + E: Electronic air cleaner
  + C: Charged filter cabinet
  + U: Ultraviolet rods for AC coils
  + O: Other: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Air Filter 1 (AF1)**

*AF1 location:* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Z#G# or AH# if at air handler)

*AF1 filter slot dimensions (in) (if filter undersized to slot, note in “problems”):*

* AF1 Length: \_\_\_\_\_\_
* AF1 Width: \_\_\_\_\_\_
* AF1 Depth: \_\_\_\_\_\_

*Does AF1 filter slot have a seal?* \_\_\_\_\_ (Y / N)

*AF1 brand:* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  *(3M, AAF, etc.)*

*AF1 rating:* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ *(MERV8, FPR10, MPR300, etc.)*

*AF1 condition:* \_\_\_\_\_\_\_

* 0: Like new
* 1: Lightly used (light dust on filter)
* 2: Moderately used (dust covered filter)
* 3: Heavily used (layers of dust on filter)

*AF1 months in use:* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Enter number, decimal places okay. Enter “X” if it cannot be determined)

*Method used to determine filter months in use*: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* OF: Install date written on filter or AHU
* PR: Participant recall
* SS: Subscription service
* RE: Other reminder (thermostat, phone app, etc.)
* OT: Other: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* X: Don’t know

*Problems with AF1 installation:* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* N: None, air filter installed properly
* U: Filter undersized (note filter size below)
* C: Filter crushed to fit into slot
* B: Filter installed backward
* X: Filter missing
* O: Other installation problem : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

## Attached Garage

### *Home does NOT have attached garage [ ] 🡪 Skip 1.6*

*Is any part of garage finished and being used as living space? \_\_\_\_ (Y/N)*

*Take photo to show living space in garage.*

*Design capacity of garage (# cars):* \_\_\_\_\_\_\_

*How many parking spaces actually available in garage (# cars): \_\_\_\_\_\_\_\_*

*Is there an exhaust fan in the garage? \_\_\_\_\_ (Y/N)*

*Is it operating? \_\_\_\_\_\_ (Y/N)*

*Are walls between GAR and house finished?* \_\_\_\_\_\_\_\_

* + Y: Yes
  + N: No
  + P: Partial
  + O: Other

If partial or other, please describe: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Is there living space above the GAR?* \_\_\_\_\_\_\_\_ (Y / N)

*If living space above GAR, is the ceiling finished?* \_\_\_\_\_\_\_\_

* + Y: Yes
  + N: No
  + O: Other: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Any attic space above garage?* \_\_\_\_\_\_\_\_ (Y / N)

*If yes, does the attic above the garage connect to the attic above the house?* \_\_\_\_\_\_\_\_ (Y / N)

*List any gas-powered equipment stored in garage (text):* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Examples: riding mower, snow blower)

*Does garage smell musty?* \_\_\_\_\_\_

* + Y: Yes
  + N: No
  + U: Uncertain

*Garage water stain code: \_\_\_\_\_*

* 0: None
* 1: <2 ft2
* 2: 2-32 ft2
* 3: 33+ ft2

Garage visible (suspected) mold code: \_\_\_\_\_

* 0: None
* 1: <2 ft2
* 2: 2-32 ft2
* 3: 33+ ft2

Any chemical odors in garage? \_\_\_\_\_

* + Y: Yes
  + N: No
  + U: Uncertain

Take photo of evidence of moisture penetration, water damage, discoloration, and/or mold growth.

## Attic

### *Home does NOT have accessible attic [ ] 🡪 Skip 1.7*

*AT1 Attic type:\_\_\_\_\_\_\_\_\_\_\_\_*

* V: vented
* S: Sealed
* N: No attic
* X: Cannot access

*AT1 insulation type:* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* F: Fiberglass batt
* C: Cellulose blown
* S: Spray polyurethane foam
* O: Other
* If other, please describe here: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Is there a vent pipe from the slab to outdoors for radon control? \_\_\_\_\_ (Y/N)*

*If yes, is the pipe identified as such? \_\_\_\_\_ (Y/N)*

*(NA if no radon control system)*

*Is there a fan installed for an active radon control system? \_\_\_\_\_ (Y/N)*

*If there is a fan, is it operating? \_\_\_\_\_*

* O: operating
* N: Installed but not operating

*Location of fan? \_\_\_\_\_*

* U: Unconditioned attic
* C: Conditioned attic
* A: Above roof
* G: In garage
* O: Other outside location

*If no fan installed, is there an electrical outlet near the radon passive vent? \_\_\_\_(Y/N)*

## Foundation spaces and drainage

*Is there a radon control system? \_\_\_\_\_ (Y/N)*

(Note in attic part of protocol if system is active or passive)

If there is a radon control system:

*What is the vent pipe diameter (inches)? \_\_\_\_\_\_*

*Is the sump well sealed (e.g. lid caulked to sump pit or gasketed with fasteners)? \_\_\_\_ (Y/N)*

*If not, please describe the deficiency here and take photos: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

*How many sumps with pumps for drainage (may be under rugs)? \_\_\_\_\_\_\_\_\_\_\_ (#)*

*Are sumps sealed or open (mark for each sump SP1, SP2, etc. on floor plan): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

* S: All sealed
* P: Some open or badly sealed
* O: All open or badly sealed

*Are plumbing penetrations caulked to the slab and/or basement walls? \_\_\_\_\_*

* *Yes, all*
* *No, none*
* *Some but not all*
* *Cannot determine*

*Is the perimeter of the slab caulked to the foundation walls? \_\_\_\_\_*

* *Yes, all*
* *No, none*
* *Some but not all*
* *Cannot determine*

*Are control joints or other cracks in the slab caulked? \_\_\_\_\_*

* *Yes, all*
* *No, none*
* *Some but not all*
* *Cannot determine*

If “No” to any of above, please take photos.

### Basement

*Is there a basement?* \_\_\_\_\_ (Y / N)

If no, skip this section.

*What is ceiling height of basement (ft)? \_\_\_\_\_\_\_\_*

*How much of the house footprint is the basement (approx. %)? \_\_\_\_\_\_\_*

*Estimated minimum depth of basement floor below grade (ft) \_\_\_\_*

*Estimated maximum depth of basement floor below grade (ft)\_\_\_\_*

*Is garage floor on same level as basement? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (Y / N)*

*Foundation wall material: \_\_\_\_\_\_\_\_\_\_\_\_\_\_*\_

* C: Poured concrete
* B: Concrete blocks
* I: Insulated concrete forms
* U: Uncertain / Not visible
* O: Other*: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

(For next few items, note what is discernible.)

*Insulation on foundation walls: \_\_\_\_\_*

* + SPF: SPF
  + PRF: Poly reinforced fiberglass
  + XPS: XPS board
  + EPS: EPS board
  + POL: Polyisocyanurate
  + NON: None
  + UN: Unclear, not discernible
  + O: Other: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Is there a knee wall between foundation and first floor? \_\_\_\_\_\_ (Y/N)*

*If yes, is the wall finished? \_\_\_\_ (Y/N)*

*If discernible, what type of insulation in the knee wall?*

* + F: Fiberglass batts
  + S: SPF
  + C: Cellulose
  + O: Other: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*What is the drying mechanism for basement, if any?*

* + S: Supply from forced air system
  + R: Supply and return from forced air system
  + E: Exhaust fan
  + D: Dehumidifier
  + N: None
  + O: Other: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Describe exterior insulation / waterproofing on foundation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

*Number of central AHU supply registers in basement:* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (#; 0 if none)

*Is basement finished?* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* F: Fully finished
* P: Partly finished
* U: Unfinished

*What is on floor of basement?* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (list all, separated by commas)

* C: Concrete
* R: Carpet or area rug
* T: Ceramic tile
* L: Laminate flooring
  + O: Other: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Furnishings in basement*: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (list all, separated by commas)

* U: Upholstered furniture
* T: Television
* E: Exercise equipment including mats
* W: Washer, dryer
* O: Other (take photos)

*Number of operable windows in basement:* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*What is largest open area of window in basement? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (ft2)*

*Is door from main house to basement weather-stripped?* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* W: Well sealed
* P: Partially sealed
* N: No seal

*If there is a door from basement to outside, is it weather-stripped?* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* W: Well sealed
* P: Partially sealed
* N: No seal
* X: No door from basement to outside

*Was door to basement open when field team arrived on Visit 1? \_\_\_\_\_\_\_*

* + Y: Yes, fully open
  + P: Partially open
  + N: Not open
  + NA: No door

*Was door to basement open when field team arrived on Visit 2? \_\_\_\_\_\_\_*

* + Y: Yes, fully open
  + P: Partially open
  + N: Not open
  + NA: No door

*Where is air barrier / air sealing?*

* *W: Basement wall to outside*
* *F: Plane between basement and first floor of house*
* *B: Both basement walls and house floor*
* *N: No air sealing*
* *U: Cannot be determined, e.g. because basement is finished*

*Does basement smell musty? \_\_\_\_\_\_*

* + Y: Yes
  + N: No
  + U: Uncertain

*Basement water stain code: \_\_\_\_\_*

* 0: None
* 1: <2 ft2
* 2: 2-32 ft2
* 3: 33+ ft2

*Basement visible mold code: \_\_\_\_\_*

* 0: None
* 1: <2 ft2
* 2: 2-32 ft2
* 3: 33+ ft2

Any chemical odors in basement? \_\_\_\_\_

* + Y: Yes
  + N: No
  + U: Uncertain

Take photo of evidence of moisture penetration, water damage, discoloration, and/or mold growth.

### Crawlspace characterization

*Is there any crawlspace? \_\_\_\_\_ (Y / N)*

*If no, skip this section.*

*If yes, note access location on floor plan and take photo.*

*How much of the house footprint is the crawlspace (approx. %)? \_\_\_\_\_\_\_*

*Estimated minimum depth of crawlspace below grade (ft) \_\_\_\_*

*Estimated maximum depth of crawlspace below grade (ft) \_\_\_\_*

*Is crawlspace vented?* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (Y / N)

*Comments on crawlspace venting: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

*What is on floor of crawl space?* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* C: Concrete
* D: Dirt
* P: Poly over dirt but not sealed
* S: Poly sealed to walls / piers

*Foundation wall material? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

* CP: Concrete, poured
* CB: Concrete blocks
* OT: Other: \_\_\_\_\_\_\_\_\_\_
* ND: Not visible

*What is on the interior of the foundation walls?*

* + N: Nothing
  + P: Poly
  + I: Insulation
  + O: Other: \_\_\_\_\_\_\_\_\_\_

*If Insulation on foundation walls, what type?*

* + SPF: SPF
  + PRF: Poly reinforced fiberglass
  + XPS: XPS board
  + EPS: EPS board
  + POL: Polyisocyanurate
  + OTH: Other: \_\_\_\_\_\_\_\_\_\_

*Is there a knee wall between foundation and first floor? \_\_\_\_\_\_ (Y/N)*

*If yes, is the wall finished? \_\_\_\_ (Y/N)*

*If discernible, what type of insulation in the knee wall*

* + F: Fiberglass batts
  + S: SPF
  + C: Cellulose
  + O: Other

If other, please describe: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*If crawlspace is not vented, what is the drying mechanism?*

* + S: Supply from forced air system
  + R: Supply and return from forced air system
  + E: Exhaust fan
  + D: Dehumidifier
  + O: Other: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Is the crawlspace directly connected to house via transfer grilles? \_\_\_\_\_ (Y / N)*

*Describe exterior insulation / waterproofing on foundation if discernible (text): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

*Observations about air-sealing between crawl space and first level: \_\_\_\_\_\_\_\_\_\_\_\_\_\_*

*Does crawlspace smell musty?* \_\_\_\_\_\_

* + Y: Yes
  + N: No
  + U: Uncertain

*Crawlspace water stain code: \_\_\_\_\_*

* 0: None
* 1: <2 ft2
* 2: 2-32 ft2
* 3: 33+ ft2

Crawlspace visible (suspected) mold code: \_\_\_\_\_

* 0: None
* 1: <2 ft2
* 2: 2-32 ft2
* 3: 33+ ft2

Any chemical odors in crawlspace? \_\_\_\_\_

* + Y: Yes
  + N: No
  + U: Uncertain

Take photo of evidence of moisture penetration, water damage, discoloration, and/or mold growth.

## Other Appliances and Potential Pollutant Sources

### Water heater

*Type:* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* SG: Storage, natural gas
* SE: Storage, conventional electric
* SP: Storage, propane
* SH: Storage, heat pump
* TG: On demand (tankless), natural gas
* TP: On demand (tankless), propane
* O: Other: \_\_\_\_\_\_\_\_

*Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

* + - A: Attic
    - B: Basement
    - C: Crawlspace
    - G: Garage
    - T: Closet
    - O: Other: \_\_\_\_\_\_\_\_\_\_\_\_\_\_

### Clothes dryer

*Fuel use: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

* + - G: Natural gas
    - E: Electric
    - O: Other : \_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

* + - B: Basement
    - G: Garage
    - L: Laundry room (inside home)
    - O: Other : \_\_\_\_\_\_\_\_\_\_\_\_\_\_

*To where does the dryer vent: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

* + - C: crawlspace
    - E: exterior (outside)
    - O: Other : \_\_\_\_\_\_\_\_\_\_\_\_\_\_

### Indoor fireplace

*Number of units:* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Fireplace 1 (FP1)**

Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Fuel use:* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* + - * G: Natural Gas
      * E: Electric
      * P: Propane
      * W: Wood

*Vent style: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

* + - * V: Direct vent
      * N: Natural vent (b-vent)
      * X: Ventless
      * U: Unsure

Repeat for **Other Fireplaces FP2, FP3**

### Standalone air cleaners

*Number of units: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

**Air Cleaner 1 (AP1)**

* + - AP1 brand: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    - AP1 model: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    - AP1 location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Take photo of AP1 setting on 1st and 2nd visit.

Repeat for **Other Air Cleaner AP2, AP3**

### Humidifiers

Stand-alone humidifiers:

*Number of units: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

**Humidifier 1 (HU1)**

* HU1 brand: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* HU1 model: \_\_\_\_\_\_\_
* HU1 location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Take photo of HU1 setting on 1st and 2nd visit.

Repeat for **Other Humidifier HU2, HU3**

Humidifiers integrated into central forced air system:

*Number of units*: \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Central Humidifier 1 (CH1)**

* CU1 brand: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* CU1 model: \_\_\_\_\_\_\_
* CH1 location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (e.g., AH1)

Take photo of CH1 setting on 1st visit.

Repeat for **Other Central Humidifier CH2, CH3**

### Standalone dehumidifier

*Number of units:* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Dehuidifier 1 (DH1)**

* DH1 brand: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* DH1 model: \_\_\_\_\_\_\_
* DH1 location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Take photo of DH1 setting on 1st and 2nd visit.

Repeat for **Other Dehumidifier DH2, DH3**

Dehumidifiers integrated into central forced air system:

*Number of units*: \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Central Dehumidifier 1 (CE1)**

* CE1 brand: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* CE1 model: \_\_\_\_\_\_\_
* CE1 location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (e.g., AH1)

Take photo of CE1 setting on 1st visit.

Repeat for **Other Central Dehumidifier CE2, CE3**

### Plug-in air freshener, scented oils, candles, incense

* Presence of plug-in air freshener: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (Y / N)
* Room codes (separate by commas): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Presence of scented oils: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (Y / N)
* Room codes (separate by commas): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Presence of candles: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (Y / N)
* Room codes (separate by commas): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Presence of incense: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (Y / N)
* Room codes (separate by commas): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Take photo of plug-in air fresheners, scented oils, candles, incense.

### Carpet

Is there carpet or a large area rug in the following areas? (Y / N / NA)

* Living room
* Dining room
* Kitchen
* Stairs from first to second floor
* Hallway
* Basement
* Master bedroom
* Other bedroom 1
* Other bedroom 2
* Other bedroom 3
* Other bedroom 4
* Office
* Other room(s): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. For example: Aircycler G2K hybrid that uses supply when air handler is on and exhaust to make up shortfall, or mixed with supply via HAC and separate exhausts. [↑](#footnote-ref-1)
2. If utility room is in garage but adjacent to house wall, select “interior” or “garage” based on where the sealing is. If unsealed in both directions, select “other” and add note to describe. [↑](#footnote-ref-2)