

Weatherization Assistance Program Health & Safety Frequently Asked Questions

DOE issued revised Health and Safety Guidance WPN 17-7 in response to concerns with clarity and consistency in how health and safety issues are approached by Grantees. To update the guidance, DOE reconvened its Health and Safety Committee to review trends and practices of the WAP network. The result was a compilation of past guidance, with minor changes and clarifications, into a comprehensive user-friendly table. However, since addressing health and safety measures is not always straightforward, as seen in several examples below, and sometimes leaves much interpretation to the Grantee, DOE decided to respond to several direct questions from the Weatherization network and offer additional clarification on WPN 17-7 in this collection of frequently asked questions.

The answers below may vary for Subgrantees due to requirements set by the Grantee’s Health and Safety Plan. Be sure to consult your DOE-approved Health and Safety Plan for specific direction that is applicable for your state, territory, or tribe. DOE will continue this dialogue and add questions and answers as identified. Grantees should contact their respective Project Officer if a question is not answered below or if additional clarification around health and safety is needed.

- “Grantee” refers to the state, tribe, or territory who directly receives WAP funds.
- “Subgrantee” refers to the local agency implementing the WAP
- “Program” refers to all of the activity being conducted under the Grantee for the DOE WAP.

Are there questions not listed that you would like to see answered, or are there clarifications that you feel need to be included? Submit your inquiry to waphealthsafety@ee.doe.gov. All FAQ questions and clarification requests will be reviewed by DOE’s Tech Team committee for inclusion.

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GENERAL

Measure Skipping

Measure skipping has been removed from the H&S guidance, as separate guidance specific to measure skipping in general is being developed for release in the future.

Consolidation of H&S specifics

Q. What happened to all the various specifics to the H&S guidance that was included in past guidance releases? There used to be specific guidance requiring the Grantee to details how they will treat items like Spray Polyurethane Foam (SPF), Deferrals, Confined Spaces, e.g..

- A. All of these requirements are still in place for Grantees and Subgrantees to adhere too. A big part of completing the H&S guidance revision, as well taking into consideration all of the comments received when opened up to the network for discussion was to reduce redundancy, and not require Grantees or Subgrantees to detail to DOE items that are covered under other parts of longstanding H&S guidance policies. Items like SPF are and have been covered in topics such as Worker Safety and Client Pre-Existing Health Conditions. When properly following the guidance given in both of these areas, it will suffice the requirements that need to be met when working with products such as SPF. Same can be said for OSHA specific items that in the past, had been asked to be detailed out. IF additional clarification is needed by a Grantee or Subgrantee, it is recommended to communicate these requests through your Project Officer, or submit the request to the email given at the beginning of this document.

Allowability

Q. Why is a health and safety measure allowed in WPN 17-7, but my Grantee doesn't allow me to do it?

- A. Just because it is allowed in WPN 17-7 does not mean that the Grantee will extend that to their program. Each Grantee has a different budget with different needs and limitations. It is up to the Grantee to establish metrics or details around specific health and safety measures. The Grantee must include details on implementation in their Health and Safety Plan. While the Plan must be consistent with WPN 17-7, there is a lot of flexibility for the Grantee. Grantees must build their Plans within the framework of WPN 17-7 and funding is limited to addressing those measures as defined by the guidance. Only those components of WPN 17-7 that are required or not allowed must be carried over to Grantee Health and Safety Plans, which become the guiding document for local programs once approved by DOE. Items that are "allowed" are allowed at the discretion of the Grantee.

Case by Case

Q. What does “case by case” mean?

- A. “Case by case” indicates that the Grantee would not be able to create a catchall policy for repair/replacement around these issues, but must instead provide guidance for the decision-making process. An example would be requiring a cost comparison between repair and replacement for water heaters. Where “case by case” is used in WPN 17-7, it should be seen by the Grantee as an opportunity to shape their Health and Safety plan in a way that benefits from sound judgment based on program regulations and knowledge of local conditions. The Grantee may require additional review or analysis of a situation to ensure that cost-effective guidelines are considered. The Grantee could create a system where they are contacted for approval of certain measures in predetermined situations, or draft additional guidance the crews must follow when assessing certain issues. “Case by case” leaves flexibility to the Grantee while highlighting the importance of providing strong oversight on the issue. However the Grantee determines that case by case situations are reviewed and approved or disapproved, it should be documented in the Grantee’s plan detailing the rigor of review.

Major, minor and limited repairs

Q. The guidance refers to “minor” repairs or “limited” repairs being allowed. What do “minor”, or “limited” repairs mean? (Need to revise Tech Eval tool to clarify terms.)

- A. These thresholds, where repairs go from being “minor” and addressable through WAP to being “major” and potential cause for deferral, must be defined in the Grantee H&S Plan so that they are assured their Subgrantees spending stays within their allocated per unit average for health and safety expenditures.
- “Limited” could refer to the *costs* associated with the repair or the *size* of the problem, but this needs to be defined in the Health and Safety Plan. Some Grantees set a maximum limit for health and safety measures before a waiver-process kicks in. The Grantee then works in conjunction with the Subgrantee to conduct an analysis of the situation and may or may not allow the cost limit to be exceeded.

Budget Categories and Definitions

Q. How do I know if it is a health and safety measure or an incidental repair?

- A. Some health and safety measures could potentially fall under the definition of incidental repair as defined by regulations and guidance.

Please note: Normally, health and safety measures can only be considered as incidental

repairs if they are outlined as such in the Grantee Plan.

[10 CFR 440.3](#) - Incidental Repairs means those repairs necessary for the effective performance or preservation of weatherization materials. Such repairs include, but are not limited to, framing or repairing windows and doors which could not otherwise be caulked or weather-stripped and providing protective materials, such as paint, used to seal materials installed under this program.

[10 CFR 440.18](#) (d)(9) - The cost of incidental repairs must be included in the cost of the package of measures installed in a dwelling.

Grantees should carefully consider the approach to be taken when they draft their health and safety procedures. While ease of accounting is an important consideration, Grantees should keep in mind that activities assigned to the health and safety budget category do not have to be cost justified by the energy audit. The same items assigned to incidental repair, weatherization material, or installation cost categories must be cost-justified.

Some cases may not be so clear, as when code compliance triggers the installation of a measure or with lead-safe work. Several questions should be asked:

- Is the measure necessary in order to perform weatherization or needed to protect the occupant as a result of weatherization activities?
- Is the measure specific to ensuring the health and safety of the occupant/worker?
- Is the activity a component of an efficiency measure (as with a flue liner when combustion equipment is replaced as an ECM)?
- What parts of an efficiency measure would have been conducted anyway, without consideration for the health and safety guidance?

While it is important to follow these general guidelines, minor distinctions should not be a cause for disallowing costs.

Q. How do I break out costs of a health and safety measure that is required as part of an efficiency measure?

- A. If the health and safety activity is not a direct component of the efficiency measure, then it can be charged as a health and safety cost. As an example, if you are installing dense-pack sidewall insulation in a pre-1978 house with lead paint on the walls, the lead-safe work-related costs can be charged separately as H&S costs, separate from the rest of the labor and material costs and not included in the SIR calculation. When determining cost break down, consider what labor and materials costs would have gone into the insulation installation if the home had no lead

paint. Everything specific to lead-safe work practices, that would not have happened otherwise during installation, may be charged as health and safety costs. The same can be said for costs of containing asbestos when removing a furnace. The furnace removal would have been conducted in order to install a new furnace as part of the efficiency measure and those costs would be part of the SIR. If the old furnace is covered in asbestos, the extra costs incurred because of the WPN 17-7 requirement to hire an asbestos control professional and take certain precautions during removal can be charged separately as health and safety costs.

Q. What if a health and safety measure can be cost justified as an efficiency measure?

A. Where the measure as a whole has the potential to be energy efficient, always attempt to cost justify the measure prior to considering it for health and safety costs. There are some instances where a measure can be considered either a health and safety measure OR an energy conservation measure. Most replacement measures such as furnaces, air conditioning, or water heaters could potentially save energy. In those instances where the measure has a cost-effective savings-to-investment ratio of one or greater, the measure must be treated as an efficiency measure. For example, if the audit or the priority list justifies the replacement of a furnace, the Grantee cannot pay for the replacement out of health and safety funds. Any potential energy efficiency measures must be considered through the audit or priority list before installation, to determine whether it is an energy efficiency measure or a health and safety measure. If the measure cannot achieve an SIR of 1 or greater, only then can it be installed as a health and safety measure.

Q. What if, as a Grantee, I would rather perform certain health and safety repairs as incidental repairs?

A. The default budget category for issues listed in 17-7 is H&S. In order to remove a health and safety repair from the health and safety budget category, the repair must:

- meet the definition of incidental repair, and
- be identified as such in the Grantee's Grantee Plan.

Issues such as minor electrical repair (including knob-tube-wiring) and minor roofing repair could potentially be identified in the Grantee Plan as incidental repairs. Once identified as an incidental repair, its application must be applied consistently across the program and be cost-justified as part of an efficiency measure or possibly a set of measures. Once the incidental repair measures are defined, the definitions must be applied consistently across the program. There is a great deal of flexibility in crafting these definitions, though.

For example, Grantees could define roof repairs specifically 2 ways: on homes that will receive no attic insulation as part of WAP roof repairs could be considered health and safety costs,

since they will help prevent mold and moisture issues, and roof repairs on homes receiving attic insulation could be treated as incidental repairs, since they will “preserve or protect” an installed measure.

Incidental Repairs and Priority Lists

Q. Can I include incidental repairs when working from a priority list?

- A. Unless the costs are minimal and can be attributed to relatively high SIR measures where the additional costs are unlikely to lower the SIR of the total package of measures to below 1, or the priority list was developed from the audit with specific incidental repair costs included, a full audit would be required in order to cost justify incidental repairs. Combining a partial audit and the priority list is not allowed and a complete audit for all weatherization measures on the home is necessary to cost-justify incidental repairs.

Deferral Requirements

Q. What happened to the requirement of detailing out the deferral policy for each allowable measure?

- A. DOE believes it was redundant for Grantees to identify their deferral policy for H&S matters within their plan, and to also detail their deferral policy for incidental items within their master plan. Grantees are now to provide a single deferral policy that details all H&S and incidental items which would require the difficult decision to defer, referral procedures, and client notification procedures as part of their master plan.

Grantees are still required to indicate in their plan what is the policy or guidance given to Subgrantees with relation to H&S measures, and thresholds that would trigger the reason to defer, on certain identified H&S issues.

Q. If the deferred client does not meet a Grantee’s priority list for services (i.e., elderly, disabled, young children, etc.) does the deferred client then get put to the bottom of the master list or fit into the general waiting list someplace based on the date of initial application?

- A. Clients that are placed on deferral, and then come off of deferral are not required to be placed at the bottom of the priority lists. Subgrantees are allowed flexibility to determine the priority of the completing the weatherization project for the client, as it is understood that often, Subgrantees will have a significant cost already invested into the home with initial outreach and energy audit.

Subgrantees are required to ensure that the client is still eligible to receive weatherization services.

Q. In our state, there is very little other resource for referral, what if no other program/funding is available for referral?

- A. Numerous additional sources exist that may be able to help assist a client when the difficult decision to defer has to be made. Often local charities, places of worship, and volunteers are

available to provide the needed assistance. Other resources is not indicative of specifically other grant type programs. Even if available, these other types of sources included in the referral of additional sources provided to the client would be considered best practice.

Deferral Additional Resources

Q. Where can we locate additional resources to help our clients when the difficult decision to defer has to be made?

- A. Below are several links to additional information with regard to resources that may be able to assist clients when placed on deferral status:
 - a. Habitat for Humanity Home Preservation: <https://www.habitat.org/volunteer/near-you/home-preservation>
 - b. HUD Home funds: https://portal.hud.gov/hudportal/documents/huddoc?id=20653_ch04.pdf
 - c. USDA Home Repair program: <https://www.rd.usda.gov/programs-services/single-family-housing-repair-loans-grants>
 - d. HUD Home Rehabilitation and Repair program: https://portal.hud.gov/hudportal/HUD?src=/program_offices/housing/sfh/title/sfixhs

General Health and Safety additional resources

Q. What resources are available for general WAP health and safety guidance?

- A. This FAQ document contains numerous additional resources for H&S guidance. The guidance itself has been greatly revamped from previous H&S guidance documents to assist Grantees and Subgrantees when dealing the numerous health and safety issues one is faced when completing a Weatherization project. Below is a link to one video that will provide additional help.
 - a. WX TV - General Health and Safety: <http://wxtvonline.org/2010/09/healthsafety-1/>

AIR CONDITIONING AND HEATING SYSTEMS/UNITS

A/C Systems

Q. Why is A/C systems the only system we can replace for “At-Risk” clients? Why can we not replace heating systems for “At-Risk” clients too?

- A. Heating Systems are required for Certificates of Occupancy in all jurisdictions, hence the default allowance for heating system repair. This universal habitability requirement does not apply to Cooling Systems in all parts of the country which means that DOE needs justification for specific instances of

cooling system repair.

Bulk Fuel Tanks

Q. Bulk fuel tank disposal is not an area of expertise for our agencies. What information are they required to provide to the clients?

- A. If weatherization is replacing a heating system, leaving an abandoned bulk fuel tank, it falls into their responsibility to advise the client how to safely deal with this potential environmental hazard. The discussion could simply be to advise clients that there are rules about disposal, that not following those rules is dangerous, and then provide contact information for the appropriate AHJ they should contact with further questions or concerns.

ECM vs. H&S

Q. If an air conditioning or heating system is obviously unsafe, why do I need to test it for cost-effectiveness before replacing with H&S funds?

- A. The regulatory purpose of this Program is to save energy for our clients while maintaining their health and safety. To that end, if a measure may possibly meet the goal of cost-effective energy savings, the Weatherization Assistance Program (WAP) must categorize the measure as an ECM per 10 CFR 440.16(h).

Primary vs. Secondary Systems

Q. What is the definition of the “primary” versus the “secondary” heating/cooling system?

- A. The primary system is generally understood to be the system (or system of units) most relied upon to provide heating/cooling throughout the season. Secondary units or systems may be employed only in extreme weather or as backup to the primary system. If Grantees wish to further clarify the definitions, they are encouraged to in their Program resources.

Space Heaters

Q. There used to be much more specific guidance around space heaters. Where has that gone?

- A. Redundant language was removed to streamline the table in the update. Some questions might be answered in the “Combustion Gases” or “Fuel Leaks” portion of the table. Attachment A has been added to the guidance to address special considerations regarding space heaters, fireplaces, and other specific heating-related issues.

Fireplaces

Q. Where can I find client education resources about fireplaces?

A. Check out EPA's Burn Wise website <https://www.epa.gov/burnwise/burn-wise-outreach-materials> for free outreach and education tools (e.g., brochures, fact sheets and videos) that provide basic tips on how to properly burn wood and maintain a wood burning appliance.

Unsafe – clarification

Q. What constitutes an “unsafe” secondary unit?

- A. The SWS and BPI 1200 describe testing protocols and action levels for combustion appliances. If Grantees wish to further clarify, they are encouraged to do so in their H&S Plans and/or Policies and Procedures manuals.

Cost of Repair versus Replacement

Q. Why does DOE ask that a HVAC system be repaired before replacing it. Often the cost of the repair is the same as replacing it.

- A. Grantees are allowed to define within their program policy of the required thresholds and documentation needed to justify replacing a system over repairing. Some examples of items that could be taken into consideration are:
- Age of unit (useful life remaining)
 - Availability of parts
 - Cumulative cost of repairs
 - Affect current system needing repair has on other remaining naturally drafting appliances

Additional Resources

Q. Are there any additional resources with regards to Heating and Air Conditioning Systems?

- A. Numerous resources exist that will help guide a Grantee and Subgrantee when dealing with Health and Safety issues surrounding Heating and Air Conditioning systems. Below are several links that will assist you:
- a. EPA Fuel Tank Disposal: <https://www.epa.gov/ust/underground-storage-tank-ust-contacts#states>
 - b. ENERGY STAR, when is it time to replace guide: https://www.energystar.gov/index.cfm?c=heat_cool.pr_checklist_consumers
 - c. Wx TV - Gas Furnace Basics - Initial Assessment: <http://wxtvonline.org/2010/05/gasfurnace-1/>
 - d. Wx TV - Gas Furnace Basics - Testing: <http://wxtvonline.org/2010/05/gasfurnace-2/>
 - e. Wx TV - Gas Furnace Basics - Troubleshooting high CO: <http://wxtvonline.org/2010/05/gasfurnace-3/>
 - f. Appliance recall notices: <https://www.cpsc.gov/>
 - g. EPA HVAC Checklist: <https://www.epa.gov/sites/production/files/2014-08/documents/hvacshrt.pdf>

ASBESTOS

Testing/Sampling

Q. Is baseline environmental sampling of asbestos an allowable DOE WAP H&S expense?

- A. Yes, this testing is an allowable cost when Grantee has policy in place that informs responses to the sampling results. For example, if a Grantee policy outlines action levels resulting in deferral/referral, then baseline sampling is an allowable expense.

Q. If a unit is deferred due to the client removing Asbestos Containing Materials and not providing the proper documentation indicating that it had been removed properly, is the unit to remain deferred even if a lengthy amount of time has passed and the client reapplies for weatherization? Also, what if a new client moves into the residence, does that then not allow the new client to receive weatherization services?

- A. Moving forward on a project with the knowledge of missing documentation would not only potentially put the Subgrantees workers at risk, it would also put the agency in a position where they are potentially liable for health risks to the workers and occupants of the dwelling. If the Subgrantee has deferred a home which then results in the owner removing asbestos containing materials, it is required that the proper documentation be provided to the Subgrantee prior to allowing weatherization services to move forward. If the proper documentation cannot be provided, the home must remain on deferral. If several application cycles later, the residence in question reapplies for weatherization, it would be expected that the agency would reaffirm the need to keep the dwelling in the deferred status. This requirement is in place to protect the safety of not only the weatherization workers, but also the occupants of the building and the agency as a whole.

AHERA Certification

Q. Do weatherization workers have to be licensed/certified to identify suspected Asbestos Containing Materials (ACMs)?

- A. No. The training requirement in the guidance table calls for the licensing/certification of workers only in the cases where the workers will be conducting work that requires such licensing/certification. Being aware of common ACMs is a basic training that can protect workers' health, and should be part of the standard training offerings.

Insulating Walls

Q. Guidance used to recommend insulating from the interior when asbestos siding was present. Why has that been removed?

- A. The language seemed redundant, since WAP technicians are aware of their options of insulating the

home from the exterior or interior. Grantees are free to maintain the language in their technical materials.

Blower Door Testing

Q. Previous guidance allowed for pressurization blower door testing if suspected ACMs were identified. Why has this language been removed? Is this no longer allowed?

- A. This is still allowed. The language seemed redundant since Grantee technicians are aware of blower door testing options. The guidance is formulated to allow flexibility in determining a policy that will work for your housing stock and situations. Pressurization may be your policy; low-flow blower door testing has been suggested. If Grantees cannot determine a suitable policy, they are encouraged to work with their training providers (if they offer technical assistance) and/or their DOE Project Officer.

Client Education/Communication

Q. What are the requirements for communication of hazards regarding abatement or encapsulation?

- A. Asbestos notification requirements vary greatly throughout the country. DOE is offering federal level guidance, but allowing Grantees to further clarify allowable activities. Contact a local AHERA or State-certified/licensed entity to learn about local requirements.

Additional Resources

Q. Are there any additional resources that will help us with our asbestos policies?

- A. Yes, numerous resources exist. Below is a link to several EPA resources that will help guide Grantees and Subgrantees when looking for information.
- What is Asbestos: <https://www.epa.gov/asbestos/learn-about-asbestos#asbestos>
 - Health effects: <https://www.epa.gov/asbestos/learn-about-asbestos#effects>
 - Training, Testing and Certification: <https://www.epa.gov/asbestos/asbestos-professionals#labs>
 - Operations and Maintenance information: <https://www.epa.gov/asbestos/information-owners-and-managers-buildings-contain-asbestos#o&m>

BIOLOGICALS AND UNSANITARY CONDITIONS

Additional Resources

Q. Are there any additional resources to help us with our biologicals and unsanitary conditions policy?

- A. Yes, there are a number of resources that provide examples of biological hazards and how you might detect them, the risks they pose to workers, and more.
- The Canadian Centre for Occupational Health and Safety has a number of issue-specific fact sheets here: https://www.ccohs.ca/oshanswers/biol_hazards/

- b. US EPA describes biological pollutants' impact on indoor air quality and provides tips for reducing biological pollutants here: <https://www.epa.gov/indoor-air-quality-iaq/biological-pollutants-impact-indoor-air-quality>
- c. The US Consumer Safety Product Commission provides a helpful client education booklet on indoor biological pollutants and how to maintain a sanitary home here: <https://www.cpsc.gov/safety-education/safety-guides/home/biological-pollutants-your-home>

BUILDING STRUCTURE AND ROOFING

Definitions

Q. The guidance Table of Issues states that homes requiring more than minor repairs must be deferred. Where can I find a definition of what is meant by “minor” repairs?

- A. The Grantee must have a definition in their Health & Safety Plan. This has been best practice for a long time, but WPN 17-7 is the first H&S guidance to explicitly require a Grantee-provided definition of what constitutes “minor” repairs, and at what point the home is deemed beyond the scope of what can be fixed with WAP funds. The definition should be quantifiable, for example, it may include limits based on square footage, costs, percentage of the overall cost, etc.

Additional Resources

Q. Where can I find additional information regarding what we should be looking for when evaluating structure and roofing?

- A. In a general sense, the guidance on this issue is focused on identifiable roof leaks, and structural issues that would make performing work or inspections on an area unsafe. WAP auditors and inspectors are likely already noting these things, but if they want to learn more about specific things to look for, this Checklist for the Routine Inspection of Buildings developed by the Kansas State Historical Society is helpful:
 - a. <https://www.gsa.gov/portal/content/111478>

CODE COMPLIANCE

Bringing Homes up to Code

Q. Is WAP meant to bring all weatherized homes up to local code?

- A. No. It is beyond the scope of WAP to bring existing homes up to current codes. Only where installation of weatherization measures triggers a code compliance issue are technicians required to meet that code. An example might be if you are insulating the attic of a home with unsafe wiring, local codes may

require upgrading the wiring as part of the insulation job. H&S Guidance now clarifies that the client file should include reference to the local code that was triggered, and which measure triggered the code compliance issue.

Client Education

Q. Are we required to notify the client of ALL issues identified in a home that are not code compliant?

A. No, only those issues that result in a deferral of weatherization services.

Additional Resources

Q. What additional resources are available for code compliance issues?

- A. Grantees and Subgrantees are required to follow the Local Authority having Jurisdiction. Below are some references that can be utilized to assist Grantees and Subgrantees when dealing with code issues.
- a. State Building Code Office Links: <https://www.buildingsguide.com/blog/resources-building-codes-state>
 - b. State Energy Code Office Links: <https://www.energycodes.gov/status-state-energy-code-adoption>

COMBUSTION GASES

Fireplaces

Q. Is there any guidance about how to treat fireplaces?

- A. Yes, in Attachment A. Though there is no consensus on how to test for safe fireplace operation, the attachment provides guidance on visual inspection, and on mimicking the effect of the fireplace on other combustion equipment in the home for combustion appliance zone depressurization testing. If an issue is detected, WAP staff will inform the client and suggest local resources to address and fix the issue. <https://sws.nrel.gov/spec/410013>

Additional Resources

Q. What resources do you recommend for learning more about combustion gases, the dangers involved, and testing procedures?

- A. There are a lot of resources out there, here are some recommendations to get you started:
- a. EPA provides a good overview of Carbon Monoxide's (CO) impact on Indoor Air Quality (IAQ): <https://www.epa.gov/indoor-air-quality-iaq/carbon-monoxides-impact-indoor-air-quality>
 - b. US Fire Administration has a nice set of CO Safety outreach materials: https://www.usfa.fema.gov/prevention/outreach/carbon_monoxide.html
 - c. Consumer Product Safety Commission has a nice brochure about the dangers of CO and how to

- avoid them in the home: <https://www.cpsc.gov/s3fs-public/464.pdf>
- d. OSHA's CO Fact Sheet includes instructions on what to do if you suspect someone has CO poisoning: https://www.osha.gov/OshDoc/data_General_Facts/carbonmonoxide-factsheet.pdf
 - e. ANSI/BPI-1200-S-2015 Standard Practice for Basic Analysis of Buildings includes combustion safety testing requirements and action levels: <http://www.bpi.org/sites/default/files/ANSI-BPI-1200%20Standard%20Practice%20for%20Basic%20Analysis%20of%20Buildings.pdf>
 - f. WxTV has a number of episodes related to evaluating different types of heating systems: <http://wxtvonline.org/tag/heating/>
 - g. DOE's training module - Heating Systems for Energy Auditors and Inspectors: <http://www.waptac.org/WAP-Standardized-Curricula/Heating-Systems-for-Energy-Auditors002FIInspectors.aspx>

ELECTRICAL

Light Fixtures

Q. Can light fixtures that have been determined to have unsafe wiring be replaced as a health and safety measure?

- A. Electrical repairs should be kept to a minimum and only completed when conditions meet the criteria for performing such a repair. If a light fixture is determined to pose a health and safety hazard when completing an associated measure, the fixture may be replaced at that time.

Knob & Tube Wiring

Q. The language in the table indicates that we can insulate over live knob & tube wiring. Is this allowed?

- A. Not everywhere – consult local code requirements. Some jurisdictions allow insulating over knob & tube wiring once certain conditions have been met. It is the responsibility of the Grantee and Subgrantee to follow the local authority having jurisdiction when completing measures. Grantees can provide better clarification of local requirements in their H&S plan and Policies and Procedures manuals.

Additional Resources

Q. What additional resources can assist us when dealing with electrical issues?

- A. Numerous resources exist with regards to electrical issues. Below are several resources that will provide additional information:
 - a. Existing wiring general information: <http://www.oldhouseweb.com/how-to-advice/evaluating-your-homes-wiring-system.shtml>
 - b. OSHA electrical hazard powerpoint presentation: https://www.osha.gov/dte/grant_materials/fy08/sh-17792-08/electrical_english_r6.pdf

- c. Electrical Safety Foundation home hazards: <http://www.esfi.org/electrical-safety>

FORMALDEHYDE, VOLATILE ORGANIC COMPOUNDS (VOCS), FLAMMABLE LIQUIDS AND OTHER AIR POLLUTANTS

Additional Resources

Q. Where can I find more information about Indoor Air Quality and common indoor air pollutants?

- A. Here are some good places to start learning more:
 - a. EPA maintains a page on VOC's impact on indoor air quality here: <https://www.epa.gov/indoor-air-quality-iaq/volatile-organic-compounds-impact-indoor-air-quality>
 - b. EPA's guide for protecting good air quality in the home, and additional related client education resources can be found here: <https://www.epa.gov/indoor-air-quality-iaq/protect-indoor-air-quality-your-home>

FUEL LEAKS

Additional Resources

Q. Where can I find out more about the dangers of fuel leaks and how to detect them?

- A. Most gas utility companies or associations have useful information on their websites, including the number to call if you find a gas leak, so look there for local information. Here are some other resources that might be helpful:
 - a. DOE WAP Standardized Curriculum for Energy Auditors, Chapter 6, "Combustion Appliances," includes testing procedures based on fuel type: <http://waptac.org/WAP-Standardized-Curricula/Energy-Auditor-002D-Single-Family-2002E0.aspx>
 - b. SafeGas.org has some nice client education resources geared towards kids: <http://www.safegas.org/tips/tips.html>
 - c. National Fire Protection Association (NFPA) 54, available to view free online, includes a suggested method of checking for leakage in Appendix C: <http://www.nfpa.org/codes-and-standards/all-codes-and-standards/list-of-codes-and-standards/detail?code=54>

GAS OVENS/STOVE TOPS/RANGES

Replacement

Q. Why can't we replace an unsafe gas range? Repair is often costly and sometimes ineffective.

- A. These concerns are recognized and shared, but health and safety spending in the Program is limited to things related to energy conservation measures. Previous working groups have determined this appliance does not qualify under the regulations.

Additional resources

Q. Where can I find out more resources about gas ovens/stoves/cooktops?

- A. Here are some resources:
 - a. The BPI standard cited above includes testing requirements and action levels:
<http://www.bpi.org/sites/default/files/ANSI-BPI-1200%20Standard%20Practice%20for%20Basic%20Analysis%20of%20Buildings.pdf>
 - b. PreventFire.com has client education materials about stovetop and oven safety:
<http://www.preventfire.com/adults/oven-and-stove-top-safety.html>
 - c. American Gas Association has discusses combustion emissions from gas ranges in this paper:
<http://www.nchh.org/Portals/0/Contents/Article0298.pdf>
 - d. WAP guidance and the BPI standard no longer require CO testing for stovetops, but if you would like to test, R.J. Karg Associates developed a protocol that produces consistent, meaningful results: http://www.karg.com/pdf/CO_Field_Protocol_annotated.pdf

HAZARDOUS MATERIALS DISPOSAL

Additional Resources

Q. What federal regulations are in place when disposing of hazardous materials?

- A. Grantees and Subgrantees are required to follow the local Authority Having Jurisdiction. Below is a link to EPA's hazardous waste site, that contains basic information, and disposal requirements from the federal perspective.
 - a. <https://www.epa.gov/hw/learn-basics-hazardous-waste#cradle>
 - b. Grantees and Subgrantees are encouraged to contact their state level Department of Transportation for any unique regulations that may be in place for transporting hazardous materials. Below is a link to each states Department of Transportation office:
<https://www.fhwa.dot.gov/about/webstate.cfm>

REPAIRS TO PREVENT INJURY

Limitations

Q. Why can't I install health and safety measures (e.g., porch boards, safety lighting, stair treads) under injury prevention?

- A. The WAP is not a rehab program. Porches, stairs, and exterior lights are not allowed as health and safety costs. 10 CFR 440.16(h) – Minimum Program Requirements states “energy related health & safety hazards” and current Health & Safety guidance states “Minor repairs and installation may be conducted only when necessary to effectively weatherize the home; otherwise these measures are not allowed.” There may be rare cases where safe entry for workers is impossible without some minor repair, like replacing a couple stair treads to access a basement where work is being installed (e.g., water heater/furnace replacement and removal), but most workers are capable of using ladders, portable lighting, and other tools to allow for safe weatherization of shell measures without correction of structural or lighting issues.

LEAD BASED PAINT

Training Requirements

Q. Are all subcontracted workers required to have lead safe weatherization (LSW) training?

- A. Potentially not. No specific individual is referenced to fulfill the Certified Renovator (RRP) role - the requirement is that any job that may potentially disturb lead paint must be supervised by a certified individual to ensure that proper precautions are taken. This can be the Crew Leader or another individual such as who is responsible for ensuring that health and safety protocols are complied with.

Protocols

Q. What does surface preparation mean?

- A. If working on a unit with lead paint, always defer to the RRP rules, regulations and training. In general remember, that as you scrape, drill, cut, open walls, etc., you are creating dust. You can keep dust down by using the right tools and following some simple practices that minimize and control the spread of dust.
- Control the spread of dust per EPA's Renovation, Repair and Painting standards:
 - i. you must keep the work area closed off from the rest of the home. The work area must be sufficiently isolated and maintained to prevent the escape of dust or debris
 - ii. You must ensure that all personnel, tools, and all other items existing the work area are free of dust and debris. Don't track dust out of the work area.
 - Use work practices that minimize dust:

- i. You should mist areas before sanding, scraping, drilling and cutting to keep the dust down (except within 1 foot of live electrical outlets)
- ii. You should score paint with a utility knife before separating components
- iii. You should pry and pull apart components instead of pounding and hammering
- iv. You must keep components that are being disposed of in the work area until they are wrapped securely in heavy plastic sheeting or bagged in heavy duty plastic bags. Once wrapped or bagged, remove them from the work area and store them in a safe area away from the residents

Additional Resources

Q. Where can I learn more about working lead-safe?

- A. Your training provider may be a good resource, and learn more here:
 - a. Wx TV has a 6-part series on working lead-safe and why it matters: <http://wxtvonline.org/tag/lead-paint/>
 - b. EPA's Renovation, Repair and Painting (RRP) Program home page: <https://www.epa.gov/lead/renovation-repair-and-painting-program>
 - c. EPA's RRP Page targeted towards contractors: <https://www.epa.gov/lead/renovation-repair-and-painting-program-contractors>
 - d. DOE WAP's Standardized Training Curricula on Lead Safe Weatherization:
 - e. <http://www.waptac.org/WAP-Standardized-Curricula/Lead-Safe-Weatherization.aspx>

MOLD AND MOISTURE

Client Education Requirements

Q. The guidance states that we must provide clients with information about landscape design and proper drainage. This seems above and beyond the expertise of typical WAP technicians. When and why must we provide this information?

- A. As part of a thorough home assessment or audit, the auditor should be identifying any existing moisture issues impacting the health and durability of the home. For example, if bulk water intrusion in the basement is an issue, the auditor should be determining if the cause is a disconnected gutter, poor drainage, etc. This is already an assumed function of the audit. The updated guidance language is clarifying that when these issues are identified as the source of moisture problems in the home, the client should be informed. If no such issues are identified, there is no requirement to talk to the client about landscaping and/or drainage.

Additional Resources

Q. Where can I find additional resources on mold and moisture in homes?

- A. There are so many resources, the hard part might be determining which are most valuable. Here are some we recommend:
- a. EPA's Mold home page: <https://www.epa.gov/mold>, which includes a Mold Slideshow
 - b. EPA's interactive Mold House Tour: <https://www.epa.gov/mold/interactive-mold-house-tour>
 - c. EPA's Moisture Control Guidance for Building Design, Construction and Maintenance: <https://www.epa.gov/indoor-air-quality-iaq/moisture-control-guidance-building-design-construction-and-maintenance>
 - d. WAPTAC lists a variety of mold & moisture related resources, including presentations and articles, and you can download the entire DOE Energy-Related Mold & Moisture Training: <http://waptac.org/Health-and-Safety/Resources.aspx#Mold>
 - e. WxTV has a 14 minute episode on Mold & Moisture: <http://wxtvonline.org/2011/01/mold/> and comes with a form helpful for integrating the episode into training, http://wxtvonline.org/downloadables/WxTV_MoldMoisture.pdf

OCCUPANT PRE-EXISTING OR POTENTIAL HEALTH CONDITIONS

Client Health Screening

Q. HIPAA does not allow a Grantee or Subgrantee to solicit specific health conditions from clients. How are Grantees and Subgrantees supposed to request this information?

- A. The intent of the guidance is not to solicit specific medical conditions that clients may have, but to inform the client of how certain aspects of weatherizing the client's home may affect them if they have certain medical conditions. The WAP representative is expected to explain to the client, "Mrs. Jones, we will be doing x, y and z to your home. Parts of this work may generate a lot of dust during installation. If you or any other residents have health conditions that might put them at risk during this work, let's talk about precautions we can take to avoid that risk." It is an opportunity to discuss with the client precautions that can be taken either by the client themselves, as in finding another place to be during the riskiest time of the installation, or the Subgrantee.

Additional Resources

Q. Where can I find additional resources to assist me in notifying clients with pre-existing conditions about the potential issues that may arise when completing weatherization measures on their home?

- A. As indicated in the FAQ's, the intent of client health screening is to inform the client of some of the aspects of weatherization may be bothersome to individuals with certain health conditions. And it is an opportunity for the client to self identify to the Agency of these conditions. Below is a link to the FAQ section of HIPAA for professionals.
- a. HIPAA FAQs: <https://www.hhs.gov/hipaa/for-professionals/faq>

PESTS

Air Sealing

Q. Guidance states that screening of windows and access points is allowed, but routine air sealing also can serve to reduce pest infiltration. Is this allowed?

- A. Yes, this is intended in the current guidance, "Screening of windows and points of access, and incorporating pest exclusion into air sealing practices to prevent intrusion is allowed." Grantees may provide further clarification in H&S plans or Policies & Procedures (P&P) manuals as is deemed helpful to the local network.

Additional Resources

Q. Where can I find additional resources about pests?

- A. Numerous resources are available, below are several links that will provide you additional information on pests:
- Pests in your area locator: <http://www.pestworld.org/pest-guide/>
 - EPA Pest Control: <https://www.epa.gov/safepestcontrol/got-pests-control-them-safely>
 - County offices pest links: <http://npic.orst.edu/pest/countyext.htm>

RADON

Client Education and Notification

Q. Does the informed consent form need to be a separate document? We prefer one customer sign off on all required client education Health and Safety materials.

- A. No, the informed consent does not need to be a separate form. Sample language that meets the requirements of the guidance has been provided, and can be used on its own or added to existing client materials.

Q. Do all clients receive EPA's A Citizen's Guide to Radon and the informed consent form, or only those in certain zones of the radon map?

- A. All clients receive the booklet and sign the informed consent form. Only those in zones where radon may be present should be considered for the precautionary measures identified in the guidance.

Definitions

Q. What is meant by "radon mitigation"?

- A. Radon mitigation is any process used to reduce radon gas concentrations in the breathing zones of occupied buildings or from water supplies. Mitigation of radon in the air is accomplished through ventilation, either collected below a concrete floor slab or membrane on the ground, or by increasing the air changes per hour in the building.

Q. What criteria are used to determine "where radon may be present"?

- A. The EPA zonal radon map linked in the guidance includes designations for the entire country. In Zones 1 and 2, there is a high likelihood radon may be present. If the Grantee would prefer to use a more local map with greater resolution of where radon may be present, they may reference that in their H&S plan.

Precautionary Measures

Q. Are we required to install poly over exposed dirt floors? If done as described, we worry it could be a slip hazard and, if installed according to the details, there would be no way for ground surface water to get out when it comes in.

- A. According to the guidance, yes, this is required. Federal guidance must be general and must show that the Program is addressing concerns about increased radon in weatherized homes. However, Grantees may request variances where they have experienced problems with certain measures.

Additional Resources

Q. Can I access the IAQ study referenced in the guidance?

- A. Yes. The IAQ study is linked from the [National Retrospective Evaluation](#) web site hosted by Oak Ridge National Labs. The direct link to the study is:
http://weatherization.ornl.gov/Retrospectivepdfs/ORNL_TM-2014_170.pdf

Q. Where can I find other resources about radon?

- A. The EPA site has a lot of resources:
1. Interactive map of radon zones: <https://www.epa.gov/radon/find-information-about-local-radon-zones-and-state-contact-information#radonmap>
 2. A list of Regional Radon Training Centers: <https://www.epa.gov/radon/radon-hotlines-and-information-resources#training>
 3. Radon FAQs: <https://iaq.zendesk.com/hc/en-us/sections/202349927>
 4. Additional resources organized by audience, for Individuals and Families, Homebuyers and sellers, and builders: <https://www.epa.gov/radon>

SAFETY DEVICES: SMOKE AND CARBON MONOXIDE ALARMS, FIRE EXTINGUISHERS

Code Requirements for Smoke/CO Alarms

Q. What happens if code compliance requires the replacement of operable smoke/CO alarms or the correction of other health and safety issues that are not allowed in the current Health & Safety guidance?

- A. Code corrections are allowable health and safety costs when they are required by the local code authority in order for weatherization work to be performed. You must note the specific code requirement with reference to the efficiency measure(s) that triggered the code compliance activity. If the code correction cannot be related to weatherization work, then WAP funds cannot be used to make the code correction. An example of this would be bringing handrails up to code, since it is not related to the installation of efficiency measures.

Q. What are the parameters for devices that are allowed in the WAP?

- A. It is understood that devices installed as part of the WAP will meet local building and safety codes, including device parameters. Grantees may choose to add clarifying language in their Program technical resources.

Additional Resources

Q. Where can I find additional resources about CO alarms, smoke alarms and fire extinguishers?

- A. Part of ensuring these devices work is making sure the customer know why they're there, so they'll change the batteries instead of removing the batteries if the alarms start beeping. Use consumer outreach materials to help get the message across:
 - a. The National Fire Protection Association (NFPA) has useful resources about -
 - i. Smoke alarms: <http://www.nfpa.org/public-education/by-topic/smoke-alarms>
 - ii. CO alarms: <http://www.nfpa.org/public-education/by-topic/fire-and-life-safety-equipment/carbon-monoxide>
 - iii. and Fire Extinguishers: <http://www.nfpa.org/public-education/by-topic/fire-and-life-safety-equipment/fire-extinguishers>
 - b. Consumer Product Safety Commission (CPSC) has a nice brochure about the dangers of CO and how to avoid them in the home, including common causes of elevated levels of CO: <https://www.cpsc.gov/s3fs-public/464.pdf>
 - c. The same organization, CPSC, includes a lot of useful information for WAP workers and clients alike in "Smoke Alarms - Why, Where and Which?" - <https://www.cpsc.gov/s3fs-public/SmokeAlarmWhyWhereandWhichCPSCPub559RevisedJuly2016PostReview.pdf>

- d. The U.S. Fire Administration provides information on choosing, and how to use, fire extinguishers: <https://www.usfa.fema.gov/prevention/outreach/extinguishers.html>

VENTILATION AND INDOOR AIR QUALITY

The answers below may vary for Subgrantees due to requirements set by the Grantee's Health and Safety Plan. The DOE identified version of ASHRAE 62.2 is a **minimum** ventilation standard so Grantees may have incorporated additional guidelines based on local conditions. Be sure to consult your DOE-approved Health and Safety Plan for specific direction that is applicable for your state, territory, or tribe. DOE will continue this dialogue and add questions and answers that come up. Grantees should contact their respective DOE Project Officer if a question is not answered below, or if additional clarification around health and safety is needed.

Existing Buildings Disclaimer

The ventilation standards in ASHRAE 62.2 were largely conceived with new construction in mind. There is a normative Appendix A that addresses ventilation requirements in existing buildings that were occupied without meeting the provisions of the Standard. Given that WAP only works in homes already occupied, or which will be occupied in the very near future, by income-eligible clients, all responses presented in these FAQs assume the use of the alternative compliance method described in Appendix A and may not include provisions contained within the Standard intended solely for new construction.

General

Q. What ASHRAE documents will help me understand the requirements and background of residential ventilation?

- A. The core document is ASHRAE 62.2-*current version*, Ventilation and Acceptable Indoor Air Quality in Residential Buildings. A new version of the Standard is published every three years (usually in the Spring).

Also helpful is the 62.2 User's Manual for ASHRAE Standard 62.2-*current version*. This includes a discussion of the Standard, background material, and many good examples of proper application of the Standard.

Finally, ASHRAE Guideline 24: Ventilation and Indoor Air Quality in Low-Rise Residential Buildings. This document provides information aimed at helping to achieve good indoor air quality that may go beyond the minimum standards presented in ASHRAE 62.2.

All of these documents can be purchased from the ASHRAE bookstore at www.techstreet.com.

You can also access read-only versions for free here: <https://www.ashrae.org/standards-research--technology/standards--guidelines/other-ashrae-standards-referenced-in-code>

Q. Now that ASHRAE 62.2 is required by my program, I am afraid I will have to install ventilation in every dwelling we weatherize. Is this true?

- A. Chances are you will have to install local ventilation and/or dwelling-unit ventilation in most of the dwellings you weatherize, but not all.

Q. When must my Weatherization program move to the most current ASHRAE 62.2 Standard and/or addenda?

- A. As of Program Year 2017, every Grantee should have fully implemented ASHRAE 62.2 – 2016. Grantees may continue using this version of the Standard until DOE releases updated guidance indicating the inclusion of a new ASHRAE standard. Grantees are free to adopt more current versions and addenda as they are released, but it will not be required until further notice. ASHRAE offers the approved addenda, errata sheets, and interpretations available for free download from their website: <https://www.ashrae.org/standards-research--technology>.

Q. What is the difference between local ventilation and dwelling-unit ventilation?

- A. Local ventilation is intended to remove pollutants near their source, such as water vapor and odors in a bathroom or cooking odors in a kitchen. Generally, the occupant controls local ventilation on an as-needed basis. Since local ventilation is intended to remove pollutants, and not simply dilute them, local ventilation is always exhaust ventilation properly vented to the outside of the building. Dwelling-unit ventilation is intended to dilute the indoor air with fresh outdoor air, thereby reducing concentrations of pollutants already present in the air. Dwelling-unit ventilation usually operates continuously. If it is designed to operate intermittently, it must be automatically controlled, typically with a timer switch, and have a higher flow rate than if it ran continuously. Dwelling-unit ventilation may be exhaust, supply, or balanced ventilation.

Q. What is the purpose of the Alternative Compliance Path for existing dwellings?

- A. The Alternative Compliance Path which is considered best practice, was added to the Standard in 2010 to help ease compliance in existing dwellings (see Appendix A of the Standard). This compliance path allows one to increase the CFM flow rate of the dwelling-unit fan to compensate for deficits in local ventilation (bathrooms and kitchens).

Q. May I leave existing local fans in place?

- A. Yes, you may leave existing bathroom and kitchen fans in place. They may be used to meet local ventilation rates as long as they are correctly ducted to the outside. They may also be used to meet dwelling-unit ventilation requirements as long as they are properly ducted to the outside, have adequate airflow, and the proper controls.

For existing fans that will remain in place, the alternative compliance path requires either the measurement of the flow rate CFM or using the airflow rating from the fan specifications for their respective airflows to be counted in the calculations. Fan flow testing and post-retrofit verification are required by WAP.

Q. If I replace an existing fan with a new one, should I match the size of the existing fan, or should I comply with the Standard's requirements?

A. If replacing a local fan, the new fan must meet the minimum CFM flow and sound requirements of the Standard.

Q. May I terminate the ductwork for my ventilation fans in the attic or garage? As they are directly connected to the outside often.

A. No. All ventilation fans, local and dwelling-unit, must terminate to the outdoors, and not into an area that is buffered in relation to the outdoors, with the use of a proper vent termination. If it is discovered that existing fans are vented to an attic or other area within the building shell (e.g. basement, crawl space, garage, screened porch) they must be extended to the outdoors, or the fan removed completely and the hole patched, if the unit is to be weatherized.

Q. What types of residential structures does ASHRAE 62.2 apply to?

A. ASHRAE 62.2-2016 applies to all spaces intended for human occupancy in all residential dwellings, regardless of building height. The Standard still does not apply to transient housing.

Ventilation Requirements

Q. What factors determine the minimum required CFM airflow for the dwelling-unit ventilation?

A. For single-family dwellings, just a few factors determine ventilation requirements:
For new construction - floor area and occupancy.

When using the Alternative Compliance Path, existing ventilation, location of operable windows, and home air-tightness (post-weatherization) are also factors.

Other factors play a role in [multifamily dwelling-units](#).

Q. My calculated dwelling-unit ventilation rate is an additional 5 CFM. Do I really need to install a fan for such a small amount?

A. No. When the calculated ventilation requirement is less than or equal to 15 CFM, whole-building (now called dwelling-unit) ventilation is not required. This de-minimis level has been incorporated into ASHRAE 62.2-2016.

Q. Why doesn't the volume of the dwelling make a difference to the required dwelling-unit minimum ventilation rate?

- A. ASHRAE 62.2 uses square footage to determine the ventilation rate. This was in large part because floor area is easier to determine and is often available in public records. Because many ceiling heights are close to 8 feet, the volume and floor area scale. Also, the determination of the infiltration credit does account for the total exposed height of the building's thermal boundary so the volume indirectly comes into play there. It is important to accurately reflect the volume based on the entire square footage included in the envelope. For example, if a basement or attic is brought into the envelope, that square footage should also be considered in the ventilation rate calculation.

Q. If a home has an unfinished basement with a washer and dryer, should I count the square footage of the basement in the floor area for ventilation rate calculations?

- A. Likely not. ASHRAE 62.2-2016 addresses this issue by including a definition for "floor area" as "all above and below grade finished area as defined in ANSI Z765."

ANSI Z765 defines finished area as area that has walls, floors, and ceilings with finishes similar to the rest of the house.

Unfinished areas are sections of a house that are neither finished nor suitable for year-round use. Patios, decks, porches, balconies, garages, and carports are examples of spaces that have varying degrees of finish but are not suitable for year-round use, and thus are considered unfinished areas.

Q. When determining the number of occupants when using the Standard for the WAP, should we use the number of bedrooms plus one, or can we use the actual number of occupants?

- A. In the rare instances where the actual number of occupants is not known, use the number of bedrooms plus one. WAP applicants are required to disclose the number of persons living in the dwelling; therefore, where higher occupancy densities are known, you must use the actual number of occupants. Lower occupant densities may be used only when approved by the DOE Project Officer as part of the Grantees annual H&S plan.

Q. How much ventilation is required in bathrooms?

- A. Although it is best practice to ventilate bathrooms, using the alternative compliance path means that you do not necessarily need to install ventilation in all bathrooms, defined as rooms with a shower, tub, or spa. The Standard will calculate airflow deficits for bathrooms with less than 50 Cubic Feet per Minute (CFM) of existing on-demand ventilation (or less than 30 CFM if there is an operable window and

the local AHJ has determined that an operable window is a permissible method of local exhaust) or 20 CFM of continuous ventilation. 25% of the total local exhaust deficit (accounting for all bathroom and kitchen deficits as applicable) will be added to the calculated dwelling-unit ventilation requirement.

Q. How much ventilation is required in kitchens?

- A. Although it is a best practice to ventilate kitchens, using the alternative compliance path means that you do not necessarily need to install ventilation in all kitchens. The Standard will calculate airflow deficits if kitchens have less than 100 Cubic Feet per Minute (CFM) of existing, on-demand ventilation, like a range hood vented to the exterior (or less than 80 CFM if there is an operable window and the local AHJ has determined that an operable window is a permissible method of local exhaust). If the kitchen has continuous ventilation, the deficit is still calculated based on an initial room airflow deficit of 100 cfm, not from 300 cfm. This effectively caps the deficit for a kitchen exhaust fan.
- If using the Alternate Compliance Path, 25% of the total local exhaust deficit (accounting for all bathroom and kitchen deficits as applicable) will be added to the calculated dwelling-unit ventilation requirement.

Q. Somebody told me a bathroom or kitchen fan can also serve as the dwelling-unit fan. Is this correct?

- A. Yes, this is correct. The Standard allows a local bathroom or kitchen exhaust fan to also serve as the dwelling-unit ventilation fan, as long as the fan satisfies the minimum requirements for both the local and dwelling-unit ventilation. Using a bathroom as an example, the fan operates continuously at the required minimum dwelling-unit ventilation rate. When the occupant uses the bathroom, they activate the local ventilation which increases the CFM flow of the fan enough to satisfy the requirement for local bathroom ventilation (50 CFM). Alternatively, as long as this continuous CFM flow rate of the dwelling-unit ventilation is at least 20 CFM, it will also satisfy the local ventilation requirement without a boost to 50 CFM when the occupant enters the bathroom.

Note 1: the local ventilation requirement in the Standard is 50 CFM if the fan is operated when needed, or 20 CFM if the fan is operated continuously.

Note 2: For a fan that operates when needed, ASHRAE 62.2 requires the fan be no louder than 3 sones. However, if this fan is also to be used for dwelling-unit ventilation, it must be no louder than 1 sone in order to meet the dwelling-unit fan minimum requirements. Existing fans that are being left in place are exempt from these sound requirements.

Q. How do the Building Tightness Limit (BTL or BTLa), Building Airflow Standard (BAS), and the Minimum Ventilation Rate (MVR) relate to ASHRAE 62.2?

- A. The BTL, BTLa, BAS, and MVR, and some other existing dwelling CFM₅₀ threshold values are all based on the older, and now obsolete, ASHRAE 62-1989 ventilation standard. There is no comparable threshold

in the ASHRAE 62.2 Standard. The minimum ventilation rate as used in the Standard defines the required CFM of ventilation, and is unrelated to the MVR, BTL, etc. used previously as an air-sealing limit.

Homes should be tightened as much as is cost effective as determined by the audit. Ventilation costs are paid for entirely with Health & Safety funds and are not included in the cost-effectiveness calculations.

Q. May I operate the dwelling-unit ventilation intermittently?

- A. Yes, dwelling-unit ventilation may be operated intermittently, as long as it is automatically controlled and the flow rate is correctly adjusted. For example, if the required dwelling-unit continuous ventilation rate is 35 CFM, but you decide to operate the fan on a one-hour cycle of 30 minutes on (0.5 hours) and 30 minutes off, the ventilation rate during the on time must be doubled to 70 CFM. If the choice is to operate the fan for 20 minutes on (0.33 hours) and 40 minutes off, the on-time fan flow rate must be 105 CFM. To find the intermittent flow rate for these examples, simply divide the continuously operated flow rate – 35 CFM for this example – by the on time-per-hour decimal – 0.5 and 0.33 respectively for the two examples – to find the intermittent flow rate CFM. If a dwelling-unit fan operates less than once every four hours, the intermittent flow rate calculation becomes more complex; see Section 4.5 (Variable Mechanical Ventilation), of the Standard for detailed information. Consider the safe operation of combustion appliances when deciding if you will operate a dwelling-unit fan intermittently. The higher flow rates may cause depressurization issues where lower rates would not. If depressurization is a concern, supply or balanced ventilation strategies should be evaluated.

Q. As I air seal a dwelling to a tighter and tighter level, what happens to the requirement for local ventilation? What happens to the requirement for dwelling-unit ventilation?

- A. Local ventilation requirements are independent of building tightness, so do not change. Dwelling-unit ventilation calculations *may* incorporate an “infiltration credit” if a blower door test is performed, so the ventilation requirement is decreased accordingly. Air-sealing will increase the ventilation requirement as the home becomes tighter; however, the additional energy savings realized by further reducing the uncontrolled infiltration/exfiltration should exceed the nominal expense of operating one or more ventilation fans.

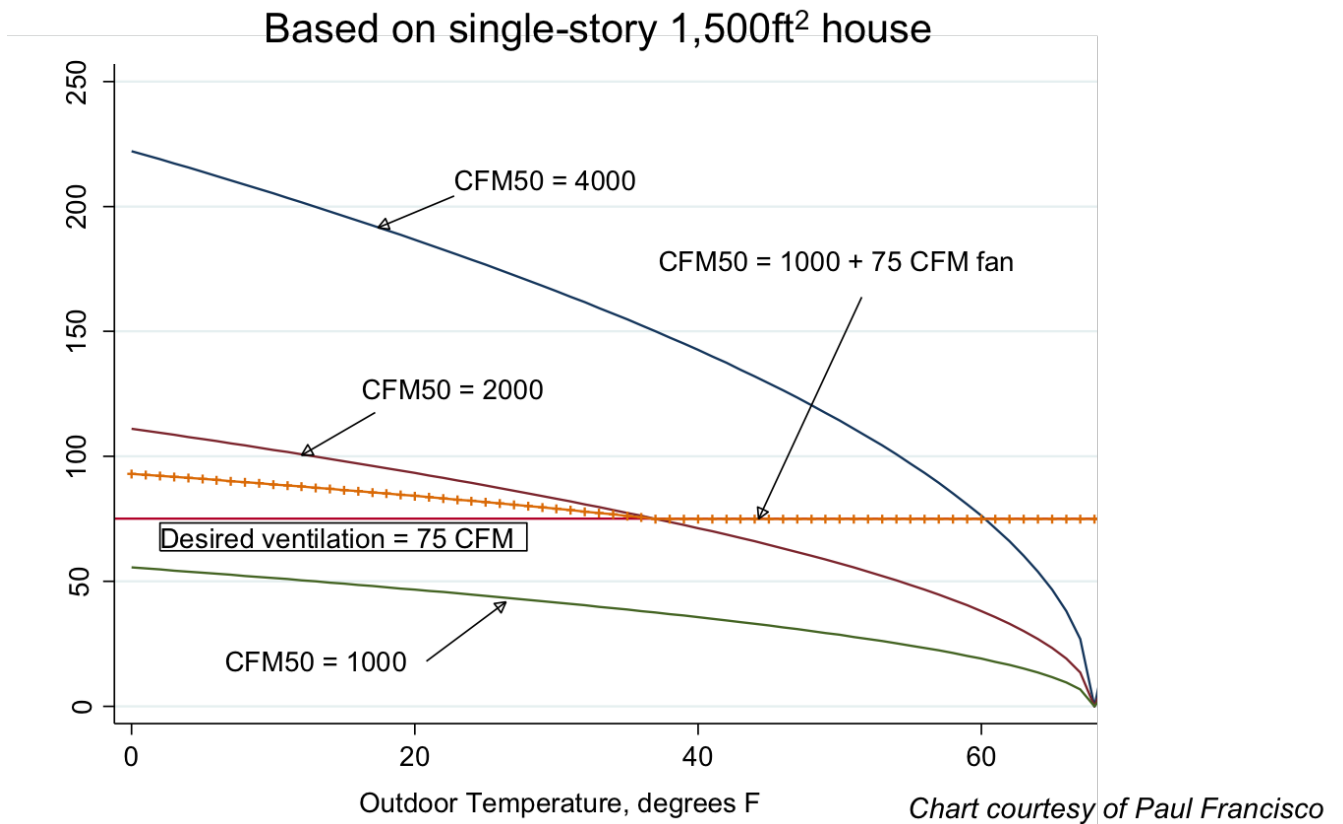
Air sealing efforts should not be limited by the requirement for dwelling-unit ventilation, but by the cost effectiveness of the air sealing; homes should continue to be tightened as long as it continues to be cost effective. Agencies should not use this as a rationale to reduce the amount of air sealing performed or they run the risk of being required to install MORE fans, instead of fewer. This is because you are not able to address any local ventilation deficits in the added dwelling-unit ventilation – often with a *single* new fan. Where bath or kitchen fans aren’t delivering the required levels, *several* new fans that meet the requirements may need to be installed.

Q. Why should we put time and money into air sealing a home and then spend more time and money putting in ventilation?

- We are investing money to improve the performance of the home, and a big part of this is controlling airflow.

First, we reduce uncontrolled air leakage in the dwelling by air sealing as much as possible as long as it continues to be cost effective. Next, we install mechanical ventilation to ensure a minimum, controlled amount of fresh air is available to the occupants. These two tasks go hand-in-hand as the two parts of controlling airflow; one is not appropriate without the other. Knowing that we will ventilate right allows us to seal tight. It is an inaccurate statement if we think leaving a home leaky ensures adequate ventilation year round.

The chart below is based on a single-story 1,500 square foot home. The chart shows that during the coldest times, when heating costs are likely at their highest, air leakage is far above that required to maintain good IAQ, due to the stack effect, costing the occupant unnecessary heating dollars. When the weather gets up to 60°F, it is warmer, but still probably a little chilly to have the windows open, and the home isn't getting enough fresh air to meet the minimum ventilation requirements.



The story told by this chart: A single story 1,500 sq ft home *without* a fan. Left at 4,000 CFM₅₀, it leaks 225 CFM at 0°F but doesn't get enough fresh air when the exterior temperature exceeds 60°F. Brought to a rather loose 2,000 CFM₅₀, it doesn't get enough fresh air any time the exterior temperature is over 35°F. Sealed to 1,000 CFM₅₀, it never gets adequate fresh air! Leaving the home at 2000 CFM₅₀ and *adding* a fan provides proper ventilation from 35° and up; however, because the home is still relatively loose, too much air enters whenever the exterior temperature drops below 35°F and heating dollars are wasted. We do our clients a real disservice when we rely on looseness and natural ventilation for IAQ.

You can use this [ventilation cost estimator web tool](#) to estimate annual ventilation costs. The tool calculates the cost of electricity to run the fan and fuel used to condition ventilated air. These costs are often lower than we think. For example, look at these projected annual costs for adequately ventilating a 1,500 square foot home in different regions:

- \$36 - \$137 in Auburn, Maine, using heating oil to heat
- \$21 - \$85 in Baton Rouge, Louisiana using natural gas for heating/electricity for cooling
- \$34 - \$128 in Spokane, Washington using electricity for heating/cooling
- \$23 - \$77 in Phoenix, AZ using electricity for heating/cooling

All of these costs are far lower than the potential savings achievable through comprehensive air sealing. Seal tight and ventilate right!

Q. Ultimately, the client has control of utilizing the installed ventilation system to comply with ASHRAE standards. With the ability for the client to not use the installed system, how is that substantially different from refusal of the installed measure?

- A. This is true, but switches can be installed in a way to discourage non-use of the ventilation. For example, when installed as a bath fan, the wall switch can be a "booster" switch that increases airflow, and when it is turned off the fan continues running at the continuous ventilation rate. The shut-off switch required by the standard can be the circuit breaker, there are options to encourage good indoor air quality. Another option is the use of a motion sensor with the installed ventilation fan, this allows the fan to run at the required continuous rate as needed until it senses motion. Once motion is sensed, the fan will ramp up to the spot/local ventilation CFM and continue to run at that speed until motion is no longer sensed for a preset amount of time. This encourages the use of the installed fan as designed.

However the Grantee decides to approach the measure, we must remember WAP is not responsible for ensuring that clients avail themselves of the various measures installed by the program. It is our responsibility to leave the home, as a system, in a condition that meets industry standards for health and safety. A client leaving the attic hatch open will also negate the benefits of the attic insulation- but

we still install it because it is the right thing to do for the home.

Other ASHRAE Requirements

Q. Beyond ventilation, what are the other things I should pay attention to for ASHRAE compliance?

- A. In addition to all the requirements related to ventilation fans, including flow rates, sound requirements, labeling, etc., ASHRAE 62.2 includes requirements related to:
- a. Clothes dryers - they must be vented to the outside, (except condensing kind). Screened porches and crawl spaces do NOT qualify as “outside.”
 - b. Combustion safety - maximum net exhaust limits are outlined in section 6.4. The next edition will allow BPI-1200 testing as alternative compliance for combustion safety.
 - c. Garages - must be isolated from living spaces through prescriptive air sealing
 - d. Duct Leakage - Ducts must be tested and sealed so total leakage is no greater than 6% of total fan flow. Note: This is largely unachievable in many WAP homes. There seems to be a collective understanding of this. Attempts by the committee to develop alternate paths have been stymied.
 - e. Filtration - if there is at least 10 feet of ductwork, the HVAC filter must be MERV-6 or better. NEW SYSTEMS must be designed to accommodate clean-filter pressure drop.
 - f. Air Inlets - for ventilation must be at least 10 feet from known sources of contamination.
 - g. and CO alarms (discussed below).

Note that reading these FAQs is no substitute for reading the actual standard in full.

Q. Do I really need to install CO alarms in every home? ASHRAE says I need to install a CO alarm in every home, but it references NFPA 720 installation standards, which state that CO alarms are only needed in homes with combustion equipment.

A. Not necessarily, but EVERY weatherized home *must* have functioning CO alarms. If they are already present, you may not need to install new ones. If there are no functioning CO alarms, you must install one. The NFPA standard referenced guides the *placement* of the alarms (e.g., distance from ceiling).

Multifamily

Q. What factors determine the minimum required CFM airflow for the dwelling-unit ventilation?

- A. The answer to this question depends upon the building type. For vertically-stacked multifamily buildings (i.e. one or more separate dwelling-units are physically located above another within the building structure), the calculations are simplified. The factors are floor area, occupancy, and existing ventilation. Infiltration credit *is not allowable* in vertically stacked dwelling-unit buildings. All existing fan flows must be measured for credit to be given in the calculations. There is an exception to this rule; however, it is rarely practical in existing buildings.

For all other building types (including horizontally-stacked multifamily buildings, such as row houses) the

same factors apply: floor area, occupancy, and existing ventilation. PLUS, dwelling-unit air-tightness (post-weatherization) *may* be considered, though *it is not required*. If an infiltration credit is going to be applied, then a blower door test must be performed.

Q. Does ASHRAE 62.2 require combustion safety testing in 100% of multifamily units?

- A. No, this is not a requirement of ASHRAE 62.2. The only combustion-safety-related requirements in the Standard (applicable to all housing types) are:
- Section 6.4 – related to adequate combustion and ventilation air and proper venting, and
 - Section 6.9 – requiring CO alarms in ALL dwellings (not just those with combustion appliances or attached garages).

Q. Some multifamily buildings are designed to introduce fresh air through pressurized common corridors, but Section 8.4.1 requires gasketing and otherwise air sealing units from interior conditioned common areas in multifamily buildings. Won't this hurt IAQ?

- A. For systems designed to introduce fresh air through pressurized corridors, this requirement does not apply.

Q. The standard requires air sealing between units in multifamily buildings to minimize air movement between dwelling units. How do we demonstrate compliance?

- A. Compliance can be demonstrated with a standard blower door test in the unit, with the unit configured as if it were exposed to the outdoor air on all sides, top and bottom. Do this by opening doors and windows in all adjacent units during the test.
- ASHRAE 62.2 uses the limit of 0.3 CFM per square foot of the dwelling unit envelope area (floors, walls, and ceilings that touch other units) at 50 Pa pressure difference.

WINDOW AND DOOR REPLACEMENT, WINDOW GUARDS

Repair/Replacement

Q: Can doors and windows be repaired or replaced as health and safety measures?

- A. Door and window replacement, repair, and/or installation are not eligible WAP health and safety expenses. They must be qualified as energy efficiency measures for replacement or meet the definition for incidental repair when repaired.

Additional Resources

Q. What makes a window or door Energy Star qualified, and how do I know if it's installed correctly?

- A. Specifications for qualified products by climate zone can be found here: https://www.energystar.gov/products/building_products/residential_windows_doors_and_skylights/ke_y_product_criteria. For installation, always have workers follow the manufacturer's instructions. In addition to the U-value and other product requirements, to qualify as Energy Star, doors and windows must have installation instructions packaged with the product or readily available online.

Safe Work Practices

Monitoring for Compliance

Q. This guidance implies our State Monitors need to evaluate safe work practices. Is in-progress monitoring a requirement?

- A. No. While DOE does strongly encourage in-progress monitoring, it is not required to meet the intent of this guidance. The guidance asks Grantees to verify that technicians are following safe work practices. In-progress monitoring has historically been the simplest method, but if the Grantee has another verification tool that meets the intent, they may use that.

Resources

Q. What OSHA regulations or worker safety resources are available to Grantees and Subgrantees?

- A. Subgrantees are required to follow all worker and occupant protection requirements based upon the scope of work being performed. Below are several links that help provide additional information to certain recurring inquires of worker protection topics (this should not be viewed as an all-inclusive list, but a small sample of worker protection requirements):
- a. OSHA Confined Space: <https://www.osha.gov/SLTC/confinedspaces/>
 - b. OSHA Fall Protection: <https://www.osha.gov/SLTC/fallprotection/index.html>
 - c. OSHA Respiratory Protection: <https://www.osha.gov/SLTC/respiratoryprotection/index.html>
 - d. OSHA Hazard Identification Link: <https://www.osha.gov/shpguidelines/hazard-identification.html>
 - e. National Safety Council workplace safety training links: <http://www.nsc.org/learn/Safety-Training/Pages/workplace-training.aspx>
 - f. WX TV - Fall Protection: <http://wxtvonline.org/2012/10/fallprotection/>
 - g. WX TV - Respirators and Personal Protective Equipment: <http://wxtvonline.org/2010/09/respirators-ppe/>

