WEATHERIZATION HEALTH AND SAFETY PLAN

TEXAS
WEATHERIZATION
CONTACT INFORMATION

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Health and Safety

Allowable Department of Energy (DOE) related health and safety (H&S) actions and expenditures are those necessary to maintain the physical well-being of both the occupants and/or weatherization workers where:

- Costs are reasonable as determined by The Department of Energy (DOE) in accordance with this approved Master Plan;
- The actions must be taken to effectively perform weatherization; or
- The actions are necessary as a result of weatherization work.

This plan will provide guidance to the Texas Weatherization Network. Health and Safety issues will be identified by Program Assessors during the initial assessment. Weatherization Crews (either subcontracted or in house) will perform the task(s) identified in the initial assessment and listed in the work order(s).

Weatherization agencies and their representatives, including subcontractors, are required to take all reasonable precautions against performing work on homes that will subject the occupants or themselves to health and/or safety risks. In cases where an occupant’s health is fragile, or an occupant has been identified to have a health condition, including allergies, and/or the crew work activities would themselves constitute a health and/or safety hazard, the occupant(s) at risk shall be required to leave during the performance of the work activities. In cases where an occupant is identified as having an allergy to a specific weatherization material, that material will not be installed. If comparable alternative materials are available and the occupant has no known allergies to the alternative materials and they meet DOE regulations, crews/contractors may substitute the alternative material(s). If no safe alternative material meeting DOE standards is available, the measure shall not be installed. This must be well documented in the client file.

Texas exercises the option to budget health and safety costs separately. NOTE: DOE calculates Health and Safety for the State of Texas as 25% of the program operations budget. Texas calculates Health and Safety as a percentage of house dollars (materials + labor + program support + health and safety). The calculation (house dollars x 20%) yields a Health and Safety amount that meets the maximum of 20% for Texas Subgrantees.

For Subgrantees, Health and Safety expenditures may not exceed 20% of total expenditures (materials, labor, program support, and health and safety) at the end of the contract period. H&S expenditures exceeding this percentage will require justification by the Subgrantee.

The Department feels that the 20% H&S amount is justified based on several factors:

1. ASHRAE 62.2 2016 has been adopted and implemented; accounting for an average of $750/unit, or 15% of the H&S budget.
2. The Department has included Air Conditioning Units as a Health and Safety Measure.
Best Practice:

- **Health & Safety Expenditures**

**Referrals and Deferrals**

Deferral may be necessary if health and safety issues cannot be adequately addressed according to WPN 11-6 guidance. The decision to defer work in a dwelling is difficult but necessary in some cases. This does not mean that assistance will never be available, but that work must be postponed until the problems can be resolved and/or alternative sources of help are found. Referrals to other resources that may assist in remediation of the cause for deferral are to be provided to the client, and documented in the client file.

A dwelling unit should not be weatherized where there is a major code violation or where there is a potentially harmful situation that may adversely affect the occupants or agency’s weatherization crew and/or other staff. When such issues are found to be present, the owner/occupant is notified verbally and in writing; and, only after the owner corrects the identified issues satisfactorily and to code, shall any weatherization work begin. The crew must declare their intent to defer weatherization work on an eligible unit on the energy audit worksheet. The audit form shall include the client’s name and address, dates of the audit/assessment, date the client was informed, a clear description of the issue(s), a clear description of the condition(s) under which weatherization work could begin/continue, a clear description of the responsibilities of all parties involved, client’s signature(s) indicating that they have been informed of their rights and options and that they understand the issues and their responsibilities. A copy shall be given to the client and a copy shall be placed in the client file.

Texas Administrative Code

- **RULE §6.415**

Best Practice:

- **Client Denials & Referrals**

**Home Assessment & Client Evaluation**

Texas has developed a Health & Safety Questionnaire that will be used as part of the application process that will then be further verified by the assessor at the time of the initial assessment.

Forms:

- **Health & Safety Client Questionnaire and Inspection Checklist**

Due to Texas’ high humidity levels in much of the state, moisture and mold-like substances are an integral part of assessments.

Forms:

- **Mold-Like Substance Notification and Release Form for Texas Weatherization Programs**
- **Identification of a Mold-Like Substance**
Unified Notification Form

Best Practice:
Mold Safe Process

Client Education

Subgrantees must take every opportunity to educate clients regarding the use and maintenance of systems in their home as well as inform them (through discussion and written materials) of the presence of any hazards including but not limited to: asbestos; biologicals; unsanitary conditions; combustion gases; building structure; roofing; code compliance; electrical; fire hazards; Volatile Organic Compounds (VOCs) and other air pollutants; mold, lead paint; pests; radon; smoke and carbon monoxide detectors; Spray Polyurethane Foam (if applicable); space heaters; and ventilation. Documentation of client education must be present in the client file, via the following documents:

- Client Health and Safety Evaluation Form
- Initial Assessment documentation of health and safety issue(s), instructions for remediation or referral made,
- Weatherization Assistance Program Denial/Deferral Letter and Right to Appeal, or
- Operating instructions, maintenance, and/or warranty for any installed H&S measure

Occupant Pre-existing or Potential Health Conditions

An important aspect of any inspection is client education, where the occupant(s) health problems are addressed. Once a clear understanding has been reached between the auditor and the client(s), work that will not aggravate any client pre-existing health condition shall begin. In some rare instances, a deferral may be required.

When a person’s health may be at risk and/or the work activities could create an H&S hazard, the at risk occupant will be required to take appropriate action based on the severity of the risk. Temporary relocation of at-risk occupants may be allowed. Failure or inability to take appropriate actions will result in a deferral.

Forms:
- H&S Client Questionnaire

Education Material:
- Consumer Mold Information Sheet

Health & Safety Issues

As potential hazards are identified by the initial inspector and auditor, they are analyzed in terms of their severity and how they will be dealt with, up to and including deferral. Wherever possible, measures should be considered through the cost justification method of the saving to investment ratio (SIR) at 1 or
greater as an Energy Conservation Measure (ECM) first, before using funds from the H&S allocation. Clients must always be informed of any Health or Safety risk discovered during the evaluation process in writing and written confirmation of receipt of that information by the client must be obtained and kept in the client file. A listing of H&S issues is compiled, any of which that can’t be corrected can result in a deferral on any given project. They are as follows:

**Air Conditioning and Heating Safety**

“Red tagged”, inoperable, or nonexistent HVAC system replacement, repair, or installation is allowed due to extreme climate conditions in Texas.

If the HVAC system issue is determined to be beyond the scope of DOE WAP, weatherization agencies will defer the work and refer the client to other resource agencies who may be able to address the problem. Texas’s deferral policy and protocols shall always be strictly adhered to when deferring weatherization work. If client is completely without cooling or heating, the weatherization agencies shall make a referral to an agency with funding that can provide at-risk clients with a portable air conditioner or temporary means of heat, such as a portable heat pump or blankets.

Texas is a diverse state with a myriad of climatic conditions. In many areas, heating is needed on a limited basis. However, throughout Texas, cooling is often a necessity.

Texas requires HVAC system installation to follow local and state code and it must be performed by a licensed HVAC professional. Weatherization agencies may subcontract licensed HVAC companies/individuals to perform heating/cooling systems installations and repairs if they follow proper state procurement procedures.

**Appliances and Water Heaters**

Replacement or repair of water heaters is allowed on a case by case basis. Replacement and installation of other appliances are not allowable health and safety costs. Repair and cleaning are allowed. The Subgrantees must initially attempt to qualify existing Water Heater as an ECM. If the Water Heater does not rank, Subgrantees may repair or replace the existing unit as a Health and Safety Measure.

Replacement of cook stoves may be done with unrestricted funds from a funding source other than DOE. Repair and cleaning are allowed. Clients shall be given all manufacturers information on the appropriate use and maintenance of water heating units.

**Cook Stoves with high CO:**
- Clean or repair
- If still has high CO levels, then see if another funding source is able to pay for the stove replacement.
- If no other source, the house must be deferred until the occupant can address the stove.
- Document all steps.
- CO deferral levels for Stoves (200 ppm for oven) that cannot be remedied.
Asbestos

Removal of siding is allowed to perform energy conservation measures. All precautions must be taken not to damage siding. Asbestos siding should never be cut or drilled. Recommended, where possible, to insulate through home interior.

It is difficult to tell whether a material contains asbestos simply by looking at it, unless it is labeled. If in doubt, treat the material as if it contains asbestos. Testing is allowed by a certified AHERA tester. Inspect exterior wall surfaces and sub-surfaces for asbestos siding prior to drilling or cutting. Typically, asbestos appears as a whitish, fibrous material which may release fibers that range in texture from coarse to silky.

It is recommended that insulation be installed through interior wall surfaces if possible to completely avoid disturbing or removing the asbestos siding on the exterior of the home.

Inspect pipe and other coverings for asbestos. Encapsulation is allowed by an AHERA asbestos control professional and should be conducted prior to any blower door testing. Removal may also be allowed by an AHERA asbestos control professional based on the situation as determined by the inspector or Agency Representative.

When vermiculite is present, unless testing determines otherwise, take precautionary measures as if it contains asbestos, such as not using blower door tests and utilizing personal air monitoring while in attics. Where blower door tests are performed, it is a best practice to perform pressurization instead of depressurization. Encapsulation by an appropriately trained asbestos control professional shall be allowed. Removal shall not be allowed.

Temporary removal of asbestos siding, so that insulation materials may be installed, may be performed if:

- Technicians wear personal protective equipment;
- The ground in the work area is covered with plastic sheeting to capture broken fragments;
- The pieces of siding to be removed are first sprayed with water;
- Breakage is kept to an absolute minimum;
- The siding is replaced; and
- The cost to benefit ratio is justified.

Do not dust, sweep, or vacuum debris that may contain asbestos. Never saw, sand, scrape, or drill holes in asbestos materials. Do not track material that could contain asbestos through the house. Be sure to follow local codes and OSHA standards on asbestos.

OSHA:

- Asbestos
Biologicals and Unsanitary Conditions – odors, mustiness, bacteria, viruses, raw sewage, rotting wood, etc.

Remediation of conditions that may lead to or promote biological concerns and unsanitary conditions is allowed. Addressing bacteria and viruses is not an allowable cost. Deferral may be necessary in cases where a known agent is present in the home that may create a serious risk to occupants or weatherization workers.

A sensory inspection is required. The use of personal protective equipment shall be strictly enforced. Respirators, protective eyewear, and protective clothing will be worn when there is suspicion or knowledge that biological agents may be present in order to eliminate or minimize crew exposure. In the past, remediation of conditions listed under this health and safety category was not allowed. It is allowable under WPN 11-6, except for the removal of known bacteria and viruses. Texas will assess the cost effectiveness and necessity of remediation of these conditions on a case by case basis.

Client must be informed of observed conditions. Clients must be provided information and explanation on how to maintain a sanitary home and steps to correct deferral conditions, if applicable.

Building Structure and Roofing

Building rehabilitation is beyond the scope of the WAP. Homes with conditions that require more than incidental repair should be deferred.

While conducting the initial audit, the building structure shall be inspected for structural integrity. Minor repairs to protect the DOE materials installed may be performed to protect the energy saving investment. Dwellings whose structural integrity is in question should be referred to agencies that deliver HUD funds or other appropriate local and state agencies. Weatherization services may need to be delayed or deferred until the dwelling can be made safe for crews/contractors and occupants. Incidental (minor) repairs necessary to effectively perform or preserve weatherization materials/measures are allowed. Examples of these include sealing minor roof leaks to preserve new attic insulation and repairing water-damaged flooring as part of replacing a water heater. Incidental structural repairs shall not include cosmetic applications, such as replacing a floor covering such as a carpet or linoleum. Only the structural part shall be replaced/repaired.

Code Compliance

Correction of pre-existing code compliance issues is not an allowable cost other than where weatherization measures are being conducted. State and local (or jurisdiction having authority) codes must be followed while installing weatherization measures. Condemned properties and properties where “red tagged” health and safety conditions exist that cannot be corrected under this guidance should be deferred.

WAP funds may be used when weatherization measures are being conducted. They may not be used
simply to correct pre-existing code compliance issues.

Acquire all required permits and licenses pertinent to installing weatherization measures. These vary by jurisdiction and it is the responsibility of each Subgrantee agency to know what the codes are in each of the areas they work, as well as what permits and licenses are required in each of the areas they work.

**Combustion Gases**

Proper venting to the outside for combustion appliances, including gas dryers, is required. Correction of venting is allowed when testing indicates a problem.

A complete mechanical systems assessment is required to be completed on every home. The procedure includes collecting general information; collecting and recording mechanical systems information; visual and diagnostic inspection of the venting and distribution system; and, combustion analysis and diagnostic testing of gas/propane fired equipment, and post-installation safety tests for CO. Combustion safety testing is required when combustion appliances are present. Pre and post combustion appliance safety inspection includes all of the following: carbon monoxide testing, draft measurement, spillage evaluation, and worst case depressurization of the combustion appliance zone (CAZ).

As applicable, every combustion appliance will be checked for a safe flue pipe, chimney or vent, adequate combustion air, and gas leakage. DOE will not permit any DOE-funded weatherization work where the dwelling unit is heated with an unvented gas- and/or liquid-fueled space heater as the primary heat source. In such cases the primary space heater must be removed and a vented, code compliant heat source must be installed prior to the installation of weatherization measures. DOE will allow unvented gas- or liquid-fueled space heaters to remain as secondary heat sources provided they comply with ANSI Z21.11.2, the IRC, and the IFGC. LIHEAP-WAP may replace non-compliant secondary unvented gas- or liquid-fueled space heaters.

Per ASHRAE 62.2, at least one CO alarm must be present in every home. CO alarms must be installed in all homes with combustion appliances; combustion appliances included: cook stoves, furnaces, water heaters, wood and coal burning stoves. Combustion appliances must be installed to the IRC or local code regulations.

Texas Administrative Code:
- [RULE §6.415](#) CO Action Levels

Client shall be provided with combustion safety and hazards information, including the importance of using exhaust ventilation when cooking and keeping burners clean to limit the production of CO.

Best Practice:
- [Combustion Appliance Zone (CAZ) Testing](#)
- [Isolating the Combustion Appliance Zone (CAZ)](#)

**Drainage – gutters, down spouts, extensions, flashing, sump pumps, landscapes, etc.**
Major drainage issues are beyond the scope of the WAP. Homes with conditions that may create a serious health concern that requires more than incidental repairs should be deferred. See Mold and Moisture guidance below.

Visual inspection and observation shall be the primary mechanism for detecting drainage issues. Client education shall include, but not be limited to, the importance of cleaning and maintaining drainage.

**Electrical (Other than Knob-and Tube Wiring)**

Minor electrical repairs are allowed where health or safety of the occupant(s) may be at risk. Upgrades and repairs are allowed when necessary to perform specific weatherization measures.

Aluminum wiring should be thoroughly inspected before any insulation work is done. If aluminum wiring is found to be active and in the areas to be insulated, no insulation should be added. When electrical repairs within the scope of the DOE WAP are required, the typical standard of remedy shall be to sub-contract the repair work to a licensed electrician. All appropriate procurement procedures shall be followed when sub-contracting. Testing shall include visual inspection, as well as voltage drop and voltage detection testing. Provide client information on overloading circuits and electrical safety and risks.

**Electrical (Knob-and Tube Wiring)**

Minor upgrades and repairs necessary for weatherization measures and where the health or safety of the occupant(s) is at risk may be allowed. However, TDHCA prohibits installing insulation over knob-and-tube wiring.

Prior to insulating around Knob and Tube wiring, cost effectiveness must be evaluated and barriers must be installed to keep insulation at least three inches from the K&T.

Best Practice:
- [Knob & Tube Wiring](#)

**Fire Hazards**

Correction of fire hazards is allowed when necessary to safely perform weatherization. At all times, crews/contractors are to look for potential fire hazards. Crews/contractors and auditors shall check for potential fire hazards in the home during the audit and while performing the weatherization work. Fire hazards must be remedied if they fall within the scope of the DOE WAP; otherwise weatherization work may have to be deferred until the fire hazard has been eliminated. Clients must be notified of any identified fire hazards and noted in client file.

Health and Safety Guidance:
- [Potential Fire Hazards in a Home (PDF)](#)
Formaldehyde, Volatile Organic Compounds (VOCs) and other Air Pollutants

WAP workers may not remove pollutants. Removal of pollutants must be done by the client or a contracted professional prior to weatherization work being performed. If pollutants pose a risk to workers and removal cannot be performed by a professional or the client refuses to remove the pollutants, the unit must be deferred.

Sensory inspection shall be the primary detection method. All reasonable steps shall be taken to limit worker exposure to VOCs. When using products known to emit VOCs, increase ventilation. Meet or exceed any label precautions. Identify, and if possible, remove the source. If not possible to remove, reduce exposure by using a sealant on all exposed surfaces of paneling and other furnishing. State and local codes and regulations regarding disposal of toxic household wastes must be followed. TEXAS WAP crews/contractors shall take every precaution necessary to minimize exposure to air pollutants. When using chemicals and products that may contain any of the pollutants within this category, strict adherence to label instructions and precautions shall be required. Known pollutants must be removed by the client or a contracted professional prior to performance of weatherization work.

Clients must be informed of any conditions and/or associated risks observed. Client must be given written information on safety and proper disposal of household pollutants, if applicable.

Health and Safety Guidance
- EPA Guidance on Common Household Wastes & Materials
- Indoor Air Quality

Injury Prevention of Occupants and Weatherization Workers – Measures such as repairing stairs and replacing handrails

Workers must take all reasonable precautions against performing work on homes that will subject workers or occupants to health and safety risks. Porch or stair repairs that would be required to make a home safe for weatherization workers are not an allowable measure in the program. Such situations are considered to be beyond the scope of Texas WAP.

As part of the safety for crew and assessors will indentify health and safety hazards according the OSHA method “Focus Four” which includes, electrical, fall protection, caught in and between, and stuck-by hazards. The client will be informed in writing of any hazards and the associated risks that may have been observed.

Health and Safety Guidance
- OSHA Focus Four
**Lead Based Paint**

Weatherization requires all weatherization crews/contractors working in pre-1978 housing to be trained in Lead Safe Weatherization (LSW) and follow EPA’s Lead; Renovation, Repair and Painting Program (RRP) rule. Deferral is required when the extent and condition of lead-based paint in the house would potentially create further health and safety hazards.

In all pre-1978 homes, crews/contractors must assess the physical condition of the home prior to conducting an audit. Texas recommends assuming that lead paint may be present in any house built prior to 1978 and to follow the proper DOE LSW protocols, OSHA regulations and EPA regulations in all pre-1978 homes. Mobile homes are exempt because lead was not used in the original manufacture of mobile homes. However, crews/contractors must be alert to any mobile home remodels/add-ons that could have contained lead-based paint or varnish.

Testing is allowed per RRP requirements. Job site set up and cleaning verification is required by a Certified Renovator. Texas WAP crews/contractors will use LSW work practices that decrease the amount of dust generated.

Texas will follow the approach that has been defined by the Environmental Protection Agency (EPA) under their Lead Renovation, Repair, and Painting Rule.

All Subgrantees are required to provide a copy of “Renovate Right: Important Lead Hazard Information for Families, Child Care Providers and Schools” to an adult occupant prior to work starting on the home. Texas WAP crews/contractors will follow all EPA RRP requirements for disposal as well as state and local code requirements. This procedure is documented by a written acknowledgement that the adult occupant has received the brochure and that the information was not only distributed, but also explained, or certify in writing that a brochure had been delivered to an adult occupant and the provider has been unsuccessful in obtaining a written acknowledgement, as directed in the publication. Confirmation of receipt of this brochure by the client will be maintained in the client file.

*Digital photo documentation must also be included. Even when a home tests negative for lead, the test form must be completed and placed in the client file.*

State policy mandates all workers on site on any weatherization project, whether they be a crew based employee of one of the sub-contractors or a private sector contractor, must complete an eight (8) hour Lead Safe Worker Practices Workshop.

Each Subgrantee must be an EPA Certified Firm and have a Certified Lead Renovator on staff. The Subgrantee is responsible to obtain and maintain the required certifications.

Best Practice:
- Lead-safe Process and RRP Requirement

WX Videos
- 12 Steps to Lead Safety
- Health & Safety Series: Respirators & Personal Protective Equipment
Health and Safety Guidance

- **Lead; Renovation, Repair, and Painting Program; Lead Hazard Information**
- **Renovate Right: Important Lead Hazard Information for Families, Child Care Providers, and Schools**

### Mold and Moisture

Limited water damage repairs can be addressed by weatherization workers and correction of moisture and mold creating conditions are allowed when necessary in order to weatherize the home and to ensure the long term stability and durability of the measures. Where severe mold-like substance and moisture issues cannot be addressed, deferral is required.

Visual assessment is required and diagnostics such as moisture meters are recommended pre and prior to final inspection. The assessment shall assure existing mold-like conditions are noted, documented and disclosed to the client; and, shall assure existing building envelope conditions do not contribute to mold-like growth when weatherization measures are applied. Mold-like substance assessment means a visual assessment combined with certain allowable diagnostics. It does not mean testing for mold. **DOE funds may not be used to test for mold-like substances.**

Texas WAP crews/contractors shall follow the Mold/Moisture Assessment Checklist when conducting the mold-like substances assessment at the time of the audit. Assessment shall include a general examination of the building, to include:

- Examine structure, maintenance activities, occupancy patterns
- Visually look for mold-like substances and water staining
- Look for evidence of standing water
- Look for evidence of condensation
- Check basement or crawl space and attic for proper venting and exhaust

#### Outdoors:

- Soil grade or drainage toward foundation
- Standing water adjacent to foundation
- Wall and roof damage allowing water intrusion
- Missing or blocked rain gutters
- No downspout extensions
- Firewood stacked adjacent to house
- Excessive shrubbery around foundation

#### Heating/cooling systems:

- Air intakes: debris (organic) vs. clean air
- Filters: dirty, damp, poor type
- Heat exchangers: dirty & damp coils, condensate pans, drainage, stagnant water
- Ducts: contamination, moisture
Occupied Space:
- Plumbing leaks
- Water stains on walls, ceilings and around windows
- Musty odor
- Surface Condensation (especially during mild weather)
- Mold-like substances on carpeting
- Humidifiers
- Window air conditioners
- Lack of bathroom, kitchen exhaust
- Clothes dryer not vented to outside
- Firewood stored indoors
- Wet clothes drying indoors

The DOE Training Resource:
- **Mold and Moisture** given by Michael Vogel of MSU Weatherization Training Center is available to all Subgrantees through TDHCA’s website
- **Energy Related Mold and Moisture...awareness and impacts for weatherization**

Best Practice:
- **Mold-safe Process**

**Occupational Safety and Health Administration (OSHA) and Crew Safety**

Workers must follow OSHA standards and Safety Data Sheets (SDS) and take precautions to ensure the health and safety of themselves and other workers. SDS must be posted wherever workers may be exposed to hazardous materials.

- OSHA 10-hour training for all crew level WAP employees
- OSHA 30-hour training for all crew leaders
  - All OSHA training shall be updated as required and kept current.
  - SDS must be present at the work sites.

On-going Health & Safety training will be the responsibility of each Subgrantee.

FAQs:
- **Weatherization FAQs Answered by TDHCA (PDF)**

For other Information on obtaining OSHA classes:
- **OSHA Outreach Trainer** to find outreach trainers and/or their schedules
- **OSHA Education Center**
- **The OSHA Consultation office**
**Pests**

Pest removal is allowed only where infestation would prevent weatherization or poses a health and safety concern for workers. Infestation of pests may be cause for deferral where it cannot be reasonably removed.

Determine whether the pest infestation would prevent or hamper the weatherization work. If removal is a viable and cost-effective option, take the necessary steps to remove the pest infestation problem so that the weatherization work can proceed. If removal is not a viable and cost-effective option or significant health and safety risks exist, defer the weatherization work and provide client with appropriate referral information.

Inform client of observed pest condition and associated risks and document in client file.

**Best Practice:**
- **Pests**

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**Radon**

Whenever site conditions permit, exposed dirt must be covered with a vapor barrier except for mobile homes. In homes where radon may be present, precautions should be taken to reduce the likeliness of making radon issues worse.

Texas has no areas of "Highest Potential," according to the United States Environmental Protection Agency standards.

Texas Department of State Health Services
- **Radon**

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**Refrigerant**

Reclaim refrigerant per Clean Air Act of 1990, section 608, as amended by 40 CFR 82, 5/14/93

Texas WAP Subgrantees shall ensure that sub-contractors who would be charged with refrigerant reclamation (e.g. removal of old refrigerators or air conditioning units) follow all EPA testing protocols; in accordance with the Clean Air Act of 1990, section 608, as amended by 10 CFR 21. Refrigerants shall be pumped into a recovery tank and disposed at an EPA approved site. Clients should not disturb refrigerant.

Non-certified technicians may not attach or disconnect hoses or gauges to measure pressure within the appliances; top-off or remove refrigerant from appliances; or otherwise damage the integrity of the appliance.
Smoke, Carbon Monoxide Alarms, and Fire Extinguishers

Installation of smoke/CO detectors is allowed where detectors are not present or are inoperable. Replacement of operable smoke/CO detectors is not an allowable cost. Providing fire extinguishers is allowed only when solid fuel (such as wood) is present.

At minimum, all homes should have at least one smoke alarm on each level, including one near the combustion zone and at least one near the bedrooms. Ceiling-mounted smoke alarms must be mounted at least 6 inches from any wall. Wall-mounted smoke alarms must be installed at least 6 but less than 18 inches from the ceilings. They should always be installed according to applicable local codes or ordinances.

Don’t install smoke alarms in these cases:
- In a home that already has a functioning smoke alarm
- Within 12 inches of exterior doors and windows
- With an electrical connection to a switched circuit
- With a connection to a ground-fault interrupter circuit (GFCI)

A CO alarm should also be installed in accordance with SWS. CO alarms should be installed in all homes with unvented space heaters (all unvented space heaters must comply with ANSI Z21.11.2) and in all homes where backdrafting could occur in a furnace, space heater, wood stove, fireplace, or water heater. Always install CO alarms according to the manufacturer’s instructions.

Don’t install CO alarms in these cases:
- In a room that may get too hot or cold for alarm to function properly
- Within 5 feet of a combustion appliance, vent, or chimney
- Within 5 feet of a storage area for vapor-producing chemicals
- Within 12 inches of exterior doors and windows
- Within a furnace closet or room
- With an electrical connection to a switched circuit
- With a connection to a ground-fault interrupter circuit (GFCI)

A fire extinguisher may be provided in homes whose primary heat source is wood. The fire extinguisher must be installed according to manufactures standards and local code in vicinity of the primary heating source.
Solid Fuel Heating (Wood Stoves, etc.)

Maintenance, repair, and replacement of primary indoor heating units is allowed where occupant health and safety is a concern. Maintenance and repair of secondary heating units is allowed.

Crews/contractors may conduct minor maintenance activities where warranted. Chimney inspection, repair and/or replacement work shall be sub-contracted to a qualified solid fuel heating system vendor. This would be a health and safety issue requiring photo documentation and receipt of services by the professional with a description of what services were performed.

If there is a traditional open masonry fireplace, assess that it is operating safely. Unless a wood burning stove/pellet stove has been maintained on a regular basis, along with annual chimney cleanings, it is unlikely that it is efficient and safety must be evaluated. Determine if cleaning is needed to increase efficiency. If it is not operating safely (as evidenced by backdrafting of smoke or complaints of itchy eyes or respiratory issues by the client) determine if repair or replacement with a vented code-compliant heating system is required.

An unsafe, unrepairable open masonry fireplace would be treated similarly to that of an unvented space heater if it is the primary source of heat. The fireplace must be rendered inoperable and replaced with a vented heating unit. The type of existing fuel will dictate the replacement. If the client has a combustion fuel source (i.e. - gas, propane, etc) than seal up the fireplace and add a vented gas heater.

When replacing a wood stove in a mobile/manufactured home the new unit must be listed for use with manufactured homes and must be installed in accordance with their listings. Units that are not manufacturer approved, discovered during an initial assessment, should be replaced with an approved manufactured home appliance, under H&S. All state and local codes must be followed.

Best Practice:
- [Combustion Appliance Zone (CAZ) Testing](#)

Space Heaters, Stand Alone Electric

Stand-alone electric heaters are defined as heaters that do not have a permanent connection to electric power and/or stand-alone heaters that have been connected to the power supply against code. Repair, replacement or installation is not allowed. Removal is recommended.

Testing will be required to assure adequate supply of electricity is available for existing stand alone electric space heaters. This will be accomplished through the use of 3 wire circuit testers, GFI electrical outlet testers, and line voltage testers.

Inform client of hazards if removal is not allowed.

Space Heaters, Unvented Combustion

Removal is required, except as secondary heat where the unit conforms to ANSI Z21.11.2. Units that do
not meet ANSI Z21.11.2 must be removed prior to weatherization but may remain until a replacement heating system is in place.

Testing for air-free carbon monoxide (CO) is to be performed. All units must have an ANSI Z21.11.1 label, and meet IRC and IFGC codes. The client must be informed of the dangers of unvented space heaters – CO, Moisture, and NO2. CO can be dangerous even if CO alarm does not sound. Assessors must calibrate the CO tester outside the home and test the ambient air in the home; following the standards in the Standard Works Specifications:

- Perform an inspection of the heater. Any of the following conditions are grounds for repair or replacement.
- Carbon monoxide (CO) test indicates ambient CO levels above 35 PPM
- Bad burners (missing, broken, or otherwise un-repair-able)
- Cross-fueled (between NG and LPG) and the orifices and/or pressure regulator have not been changed
- Missing radiants
- Open flame burners
- Rubber supply lines
- Charring or scorching

If cause cannot be determined, calibrate equipment and re-test. If still indeterminable, refer to local gas company. Any time replacement is deemed necessary, first consider performing the replacement as an EMC (energy saving measure) before replacing as a Health & Safety measure.

On-going Health & Safety training will be secured by the Subgrantee.

The Department will provided guidance via Q&As, and postings of FAQs to Department Website. [http://www.tdhca.state.tx.us/community-affairs/wap/guidance.htm](http://www.tdhca.state.tx.us/community-affairs/wap/guidance.htm).

**Space Heaters, Vented Combustion**

Vented space heaters shall be treated as furnaces. Combustion safety testing is required when combustion appliances are present. Weatherization Assessors and Final Inspectors must conduct the combustion appliance safety inspection. This includes all of the following: carbon monoxide testing, draft measurement, spillage evaluation, worst case depressurization of the combustion appliance zone (CAZ), a safe flue pipe, chimney or vent, adequate combustion air, and gas leakage as applicable. Combustion safety test results must be acted upon appropriately according to the Standard Work Specifications and BPI protocols.

The Department has defined maximum acceptable CO readings as 200 parts per million for vented combustion appliances. Vented space heaters tested at >200 ppm must be repaired or replaced. CO detectors should be installed in all homes when fuel-fired (combustion) appliances exist.
Spray Polyurethane Foam (SPF)

Use EPA recommendations (available online at: https://www.epa.gov/saferchoice/quick-safety-tips-spray-polyurethane-foam-users when working within the conditioned space of when SPF fumes become evident within the conditioned space. When working outside the building envelope, isolate the area where foam will be applied, take precautions so that fumes will not transfer to inside conditioned space, and exhaust fumes outside the home. Testing will include checking for penetrations in the building envelope. Sensory inspection inside the home for fumes during foam application must also occur.

The client must be informed of plans to use two-part foam and precautions that may be necessary. Workers using foam products must receive training on the proper use of these various products and understand the specification for each application type. MSDS are mandatory for any foam product used and a thorough understanding of the temperature sensitivity of the product in use is required.

Ventilation

Ventilation is only required if ASHRAE 62.2 calculations indicate added ventilation. In addition, ASHRAE 62.2 addresses dryer venting, CO alarm, and air sealing to isolate attached garages requirements. Existing fans and blower systems should be updated if not adequate.

Subgrantees are required to use the Alternative Compliance Path for Existing homes and perform an ASHRAE calculation through certified software such as RedCalc. Both the output of the software and a copy of the blower door data sheet must be placed in the client file.

In addition, the ASHRAE standards are incorporated into the Standard Work Specifications

Subgrantees who install ventilation must educate the clients on effective use of the exhaust ventilation equipment by:

1. Leaving owner’s manual with client
2. Demonstrating how to use the exhaust fans.
3. Providing client education information on ventilation systems installed.
4. Providing client education on proper operation and maintenance.

Tools and Guides:
- Exhaust Fan Flow Meter Quick Guide (PDF)
- Single-Family Homes: Standard Work Specifications Field Guide (PDF)

Assessment Calculators:
- ASHRAE 62.2 Calculator (www.residentialenergiedynamics.com)

Client and Assessment Forms:
- Blower Door and Duct Blower Data Sheet (XLS)
Window and Door Replacement, Window Guards

Replacement, repair, or installation is not an allowable health and safety cost but may be allowed as an efficiency measure if cost justified.

Window replacements may only be performed as an ECM. When working on windows follow LSW requirements for pre-1978 homes.

Best Practice:
- Window Repair or Replacement
- Window Repair – LIHEAP
- Door Repair or Replacement