



Weatherization Manual

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for

United States Department of Energy (DOE)

United States Department of Health and Human Services (HHS-LIHEAP)

Bonneville Power Administration (BPA)

and

Washington State Weatherization Plus Health (State)

Prepared By:

Washington State Department of Commerce, Energy Division

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WEATHERIZATION WORKS

Policies and Procedures - MF

Managing the Low-Income Weatherization Program

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[2020 Standard Work Specifications \(SWS\)](#)

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The following Policies are specific to Multifamily (5 units and more).

For information not included here, refer to the general Policies and Procedures, 2022 WA Multifamily Weatherization Field Guide, or the Standard Work Specifications for guidance.

		Last Modified
Policy 1.4.2	Owner Contributions	July 2022
Policy 2.1.2-MF	Qualifying Multi-Unit Residences (P1.5)	March 16, 2022
Policy 2.1.8-MF	Phasing Multifamily Weatherization Projects	July 2018
Policy 5.1.1-MF	General Multifamily Requirements	July 2022
Policy 5.2.1-MF	Multifamily Energy Audit	Sept 8, 2021
Policy 5.2.3-MF	Multifamily Diagnostic Testing	July 2018
Policy 5.2.6-MF	Multifamily Representative Sample	July 2018
Policy 5.3.1-MF	Multifamily Air Sealing – Attached Buildings	Sept 8, 2021
Policy 9.3-MF	Multifamily Indoor Air Quality – Mechanical Ventilation	July 2018

Weatherization Policy

See also:

[RCW 59.18.060, Landlord Duties](#)[WAP Memorandum 035, Weatherization Leveraging](#)[Policy 2.1.8-MF, Phasing Multifamily Weatherization Projects](#)

Replaces: Policy 1.4.2 – Sept 8, 2021

POLICY 1.4.2 OWNER CONTRIBUTIONS

1. **Supplementing, not supplanting, rental property owner responsibilities:** Local Agencies shall inform the owner of their legal responsibilities and liabilities under *RCW 59.18.060*.
 - a. **State law:** By state law, rental property owners are responsible to provide facilities adequate to supply heat, water, and hot water as reasonably required by the tenant.
 - b. **Capital improvements:** Since a new heating or air conditioning system is a capital improvement to the property, which is the owners' responsibility, the expectation is for a rental property owner contribution of at least 50 percent of the cost.
2. **Rental property owner contributions:** Contributions are required from rental property owner. The purpose of Weatherization (Wx) is to benefit the low-income client (tenant).
 - a. **Multifamily rental property owner contributions:** Wx project contributions from a multifamily rental property owner are required.
 - b. **Single-family rental property owner contributions:** Wx project contributions from a single-family rental property owner are not required, but allowed and encouraged. Non-participation, by single-family rental owners not willing to provide an owner contribution, shall not be reason for deferring a measure or project.

Exceptions (MF and SF):

- E1 **Low-income owners:** If the building owner (rental property or owner-occupied) meets the income eligibility and qualifies as low-income themselves, Local Agencies are prohibited from requiring any owner contribution. The low-income owner is allowed to voluntarily contribute *In-kind Contributions* or for *Upgrades to meet Client Preference* beyond Wx project scope of work (SOW). See examples (below).
- E2 **Low-income mission-based owners:** If the building owner/organization's mission is to preserve and provide long-term low-income housing, any additional owner contribution is encouraged, but the Local Agency may waive the contribution.
- E3 **If using DOE funds,** Local Agencies shall:
 - Ea Not solicit cash contributions from a single-family rental property owner.
 - Eb Not accept cash contributions from an owner occupied low-income client owner.

3. **Determining contributions and minimum required expectations:** To ensure the Weatherization (Wx) benefits accrue to the low-income client (tenant), the Local Agency shall:
 - a. Negotiate with the rental property owner for each Wx project. The type and amount of the owner contributions may vary based on market conditions, the owner, and the specific project.
 - b. Endeavor to create good partners and produce quality weatherization projects.
4. **Owner contributions** may include all or any combination of the following:
 - a. **Cash Contribution:** A recommended minimum baseline buy-in is \$500 for the first unit, plus an additional \$125 for each additional unit or 10% of the total Weatherization Project Installed Measure Cost (IMC), whichever is greater.

Exceptions:

- E1 **Owner Occupied:** Low-income clients are prohibited from providing cash contributions.
 - Ea **Upgrades to meet Client Preference:** If a client has a preference for a material upgrade, Local Agencies may allow an option for client to voluntarily pay cost difference from Local Agency identified materials to materials that meet the client preference, as long as the substitute material still meets Wx energy efficiency program goals (i.e. $SIR \geq 1$). A qualifying upgrade example is color choice. This expense is not considered an owner contribution.
- b. **Equipment Contributions:** The expectation for system replacement (e.g. space heating, space cooling, and water heating) rental property owner contribution is at least 50 percent of the cost.

Exception:

- (1) **Set project minimum:** To set the minimum rental property owner contribution the Local Agency shall:
 - (a) **Existing equipment needing repair or replacement:** Use the cost the rental property owner would need to pay to repair, replace, or install a system of their choice, without Wx Program assistance, assuming this amount is less than 50% of cost of the proposed weatherization-funded system.
 - (b) **Existing equipment in working order:** Use the Savings-to-Investment (SIR) calculation as a basis. If the Local Agency intends to upgrade the heating system for the purpose of saving energy and the replacement system:
 - i. Achieves a $SIR \geq 1$, no rental property owner contribution in any amount is required, but a contribution is still encouraged.
 - ii. Cannot achieve a $SIR \geq 1$, then set the rental property owner contribution amount so as it might be used as leverage to cover the overage.

- c. **In-kind Contributions:** Including, but not limited to: labor, materials, repairs, and a commitment to maintain equipment and property.
- d. **Rent Freeze:** Weatherization improvements cannot be used to justify any rent increase. A minimum of twelve (12) months' rent freeze is recommended.
- e. **Preserve Low-income Housing:** Commitment assuring continued low-income tenant occupancy for a minimum of five (5) years.
- f. **Contract Directly:** The owner may hire contractors to complete the construction work described in the Scope of Work (SOW) including repair and weatherization work, provided the Local Agency has oversight and performs inspections for quality control and Weatherization Program compliance.
- g. **Any combination of the above.**

5. **Phasing Weatherization Projects:**

Refer to Policy 2.1.8-MF, *Phasing Multifamily Wx Projects* for more information.

Housing providers often work through large maintenance projects on their properties (such as re-roofing or re-siding) as their funding is available. Local Agencies are encouraged to time the weatherization of buildings with these opportunities in mind, and to install new measures as leveraged funds and schedules are made available.

Phasing Multifamily Wx Projects opportunities include, but are not limited to:

- a. Coordinate Weatherization measures to coincide with scheduled maintenance or planned capital improvements to maximize owner funding contributions.
- b. Deep energy savings which become available during the course of maintenance projects.
- c. Leveraged funding availability from owners.

Weatherization Policy

See also:

[WPN 22-5 Expansion of Client Eligibility in the Weatherization Assistance Program \(WAP\)](#)[Multifamily Potential Wx Candidate List](#)[HUD PHA listing](#)[Policy 1.1.1, Applying Income Eligibility Standards](#)[Policy 1.3.1, Documenting Income Eligibility](#)[Policy 1.3.3, Using Property Owner/Agency Agreements](#)[Policy 2.1.5, Subsidized Housing Weatherization](#)

Replaces: Policy 2.1.2-MF – July 2021

POLICY 2.1.2-MF QUALIFYING MULTIFAMILY RESIDENCES

Local Agencies may weatherize multifamily properties. The following conditions apply:

1. **Property Owner/Agency Agreement:** The owner shall sign a rental property owner/agency agreement. See **Policy 1.3.3, Using Property Owner/Agency Agreements**.
2. **Income Eligibility:** Local Agencies shall meet one of the following:
 - a. **LIHEAP Guidelines:** Local Agencies shall apply LIHEAP Income Eligibility Guidelines to each multifamily building tenant. See **Policy 1.1.1 Applying Income Eligibility Standards** for more information. To qualify for Weatherization Services, tenant incomes shall meet one of the following:
 - (1) **Qualifying 66% or More:** Not less than 66 percent (50 percent for duplexes and four-plexes) of the resident households of the building are:
 - (a) Currently eligible, or
 - (b) Will become eligible within 180 days.
 - (2) **Qualifying 50% to 66%:** Low-income occupancy falls between 50 and 66 percent and the weatherization work will create significant energy savings or additional funds are leveraged from property owners, utilities, or other sources.
 - b. **U.S Department of Housing and Urban Development (HUD) Qualified – Categorical Income Eligibility:** Multifamily projects qualified through a HUD means-tested program, accepting households using percentages of Area Median Income (AMI) ranging from 0% AMI to 80% AMI are categorically income eligible for Weatherization Services.

Local Agencies shall certify that applicants have met the income requirements of HUD means-tested programs through mechanisms including, but not limited to, applicant documentation, interagency lists of recipients, shared system databases, etc. Method of verification of eligibility must be included in the client file. See **WPN 22-5, Expansion of Client Eligibility in the Weatherization Assistance Program (WAP)** for more information.

- (1) **DOE's published HUD Project List:** DOE publishes this HUD project list(s), if Local Agencies use this list to assist income qualifications they shall:
 - (a) **PHA Owned:** Consider all housing owned and operated by a Public Housing Authority (PHA) 100% income eligible
 - (b) **Project-Based Assistance:** Determine the percentage of income eligible units of privately owned MF buildings receiving project-based assistance; and confirm 66% (or 50%-66%) of the resident households of the building qualify.
 - (c) **Tenant-Based Assistance:** Determine the percentage of income eligible units of privately owned MF buildings that household residents are receiving tenant-based assistance (e.g. tenant-based rental assistance (TBRA), housing choice vouchers (HCV), energy assistance (EA), etc.); contact the building owner, manager, agency administering income based assistance, or individual residents to obtain records; and confirm 66% (or 50%-66%) of the resident households of the building qualify.
- (2) **Multifamily Potential Wx Candidate List:** Local Agencies may use the *Multifamily Potential Wx Candidate List* as an 'interagency list of recipients to identify potential Wx projects. To use this list to reduce intake burden through [Categorical Income Eligibility](#), Local Agencies shall confirm a listed project has qualified for a HUD's means-tested program project and document in the project file.

If a listed project has not qualified for a HUD's means-tested program, most occupants are still likely to meet income qualifications, but documentation confirming qualification is required. A certification process similar to the centralized records or rent rolls verification is allowable.
- c. **Using Centralized Records and Rent Rolls:** Local Agencies may use their own certification form to verify income eligibility of residents in public/subsidized multifamily buildings. When centralized records ([Rent Rolls](#)) are available, they may substitute for individual Household Information Forms (HIF) when certification documentation include both:
 - (1) **Rent Roll Certification:** Property Management statement attesting to tenant income accuracy as of date of signature; and
 - (2) **Computation Certification:** Local Agency staff shall certify computation to determine a minimum of sixty-six percent (or fifty percent with leveraged funds) of actual residents (or by required occupancy formula) meet Weatherization income eligibility requirements.
2. **Demographic Information:** Local Agencies shall collect demographic information either from public/subsidized multifamily housing provider in aggregate or from individual tenants. See **Policy 1.3.1, Documenting Income Eligibility**.

3. **DOE Fund Restrictions:** The maximum amount of DOE funds that can be used will be the lesser of either one of the following:
 - a. The percentage of low-income eligible units multiplied by the total allowable weatherization costs (estimated in the initial audit).
 - b. The number of eligible units multiplied by the maximum average allowable cost per unit.

Weatherization Policy

Replaces: NEW MF

See also:
[Exhibit 1.3.3B, Rental Property Owner/Agency Agreement](#)

POLICY 2.1.8-MF PHASING MULTIFAMILY WEATHERIZATION PROJECTS

Purpose: Commerce allows Local Agencies to weatherize Multifamily projects in multiple phases, over time. Multifamily projects represent a large investment, serving multiple units, installing a variety of measures, and benefitting many tenants. Phasing Weatherization projects allows 1.) coordinating with the owners' capital improvements, their operation and maintenance schedule, and limited staff time; 2.) Minimizing the disruption of the tenants, better coordination with the tenant's schedules, and tenant notification requirements; 3) Addressing the needs of the building, such as emergency repairs/replacements to space-heating equipment, domestic hot water equipment, roofs and other critical systems.

1. Planning Wx Phased Projects:

- a. **Building as a System Approach:** Local Agencies shall perform a full audit and determine a comprehensive Scope of Work with the "Building as a System" mindset.
- b. **Presenting Scope of Work to Owner:** Local Agencies shall present to the owner all measures the auditor deems appropriate for the building.
- c. **Establishing Relationships, Phases, and Project Timeline:** Local Agencies shall negotiate with the owner the package of measures to include in the current phase scope of work. Initial phases are an opportunity for LAs to establish a relationship with building owners to ensure the LA is a part of future energy efficiency and health and safety related capital improvements to the building. Measures not included in the current phase of the project shall be deferred and scheduled into future phases.

Examples:

- (1) A building needs an emergency boiler replacement. The owner is also planning on a major rehab in two years. Assuring compliance with the Wx Program requirements such as: Building as a System and not supplanting landlord responsibilities (RCW 59.18.060), the LA may fund the boiler replacement now and fund other measures that would best align with the rehab later, such as insulation, ventilation, and air sealing.
- (2) A building owner wants to upgrade the lighting in their building. The auditor identifies other potential measures in the building, but the owner does not have funds budgeted to cover the required owner contribution.

- d. **Owner Commitment:** The final Energy Audit Report, including a Scope of Work shall define the Wx Project phases and proposed timeline. Attached to the Owner/Agency Agreement, upon signature the owner or agent agrees to the Scope of Work and scheduled phases. See **Exhibit 1.3.3B, *Rental Property Owner/Agency Agreement*** for phased project proposals and preliminary schedules.
2. **Scheduling Phases:** Local Agencies shall use phasing projects to coordinate with:
 - a. **Building owners**
 - (1) **Capital improvements:** If available, the Local Agency shall review the building's Capital Needs Assessment or similar document and identify future capital projects to align with Auditor recommended Wx Measures.
 - (2) Operation and Maintenance schedule
 - (3) Limited staff time.
 - b. **Tenants**
 - (1) To minimize tenant disruption
 - (2) Tenants schedules
 - (3) Tenant notification
 - c. **Building's needs**, including but not limited to:
 - (1) Weatherization opportunities
 - (2) Health and Safety issues
 - (3) Repairs
 - (4) Emergency heating or domestic hot water systems replacement
3. **Correlating Measures:** Measures related with safety standards, requirements, or other measures shall always be performed together within the same phase of the Wx project. The following is not an exhaustive list. Measure correlations, include but are not limited to:
 - a. **Envelope Measures:** Insulation and air sealing measures always trigger ASHRAE ventilation standards and BPI combustion safety standards.
 - b. **Health and Safety Measures:**
 - (1) **Combustion Safety:** Issues related to combustion safety shall be resolved upon discovery.
 - (2) **Hazardous Materials:** Rules and regulations dealing with lead-based paint, asbestos containing materials, and other hazards always apply when disturbing materials that contain or are presumed to contain hazardous materials.

Weatherization Policy

See also:

[Multifamily Weatherization Specification](#)[Standard Work Specifications](#)[Chapter 9, Health and Safety](#)[Policy 5.1.2, Weatherization Project Documentation](#)[Policy 5.1.3, Deferral Standards](#)[Policy 1.4.1, Ensuring Direct Benefit](#)[Exhibit 5.S10, Standards for Weatherization Material Specifications](#)

Replaces: Policy 5.1.1 February 21, 2020

POLICY 5.1.1-MF GENERAL MULTIFAMILY REQUIREMENTS

Multifamily (MF) Weatherization projects shall be weatherized in accordance with the State of Washington Weatherization Manual (Wx Manual). The more specific requirements take precedence over the general requirements.

The Multifamily (MF) policies of the Wx Manual are meant to be used in conjunction with the single-family (SF) policies of the Wx Manual. Unless differentiated in the multifamily policies, Local Agencies shall adhere to all applicable single-family policies and procedures. The more specific MF policies take precedence over the more general SF policies.

The *Washington State Multifamily Weatherization Field Guide* (MF Wx Field Guide) defines applicable work that meets the specifications, objectives, and desired outcomes outlined in the Standard Work Specifications for Home Energy Upgrades (SWS). The ***Guidelines for Home Energy Professionals Standard Work Specifications*** (Multifamily SWS) shall be referenced for any work the WA Wx Manual-MF or MF Wx Field Guide do not address.

1. **Building-as-a-System:** Commerce provides weatherization services based upon the building-as-a-system approach integrating advanced weatherization technologies into service delivery. This approach includes data collection, testing, assessments, and education for all eligible clients.
2. **Minimum Requirements:** Each multifamily weatherization project shall include the following Weatherization Services at a minimum:
 - Energy audit,
 - A complete visual Needs-Assessment - Wx, Health and Safety, and Repair measures,
 - Assessment of electric baseload measures:
 - water heaters,
 - refrigerators,
 - compact fluorescent light bulbs (CFL) or light-emitting diode lamps (LED),
 - lighting fixtures, and
 - space-heaters,

- Diagnostic tests, energy-related health and safety assessment,
 - Complete TREAT energy model,
 - Implementation of a minimum of one Major Measure, to qualify as a Wx project,
 - Client education,
 - Appropriate low-cost measures,
 - Applicable weatherization-related repairs, and
 - A thorough consideration of the building owner and residence.
3. **Compliance:** The Local Agency shall meet program requirements for insurance, licensing, labor standards, warranties and guarantees, applicable permit compliance, applicable code and regulation compliance, applicable staff certifications, and site clean-up and salvage.
 4. **Non-Compliance:** In an instance when a requirement cannot be met, document in the project file why and what actions were taken.
 5. **Workmanship:** All work shall be performed in a professional manner following standard residential construction practices.
 6. **Health and Safety:** Prior to providing weatherization services, energy-related health and safety hazards necessary to install weatherization materials, shall be eliminated. Any hazards created as a result of installing weatherization materials shall be eliminated. Energy-related health and safety measures and repairs are intended to protect building occupants and workers. See **Chapter 9, Health and Safety**, for additional information.
 7. **Deferral:** Deferral may be necessary if there are any problems beyond the scope of the Weatherization Assistance Program. See **Policy 5.1.3, Deferral Standards**. Local Agencies shall inform clients of any health and safety hazards that may be beyond the scope of the weatherization program.
 8. **Benefitting Low-Income Clients:** Weatherization shall directly benefit the low-income clients including occupants and tenants. Multifamily buildings, including rental housing, offer opportunities for energy efficiency upgrades that are a cost-effective approach to lowering operating expenses, maintaining affordability, and creating healthier, more comfortable living environments for low-income families. See **Policy 1.4.1, Ensuring Direct Benefits** for requirements.
 9. **Multifamily Client Education:** Multifamily clients for Client Education include but are not limited to: occupants, tenants, owners, building managers, facilities personnel, and maintenance staff. The level of education provided is dependent on client's role.

10. **Warranties:** The Local Agency and all Subcontractors shall provide warranties in writing against any defect in the material, manufacture, design or installation of all materials, equipment, or products that is found within one (1) year from the date of completion of installation. Any defects found within the warranty period shall be remedied without charge and within a reasonable period of time. The warranty information shall be given to the occupant and a copy placed in the project file.
11. **Code compliance:** The Local Agency shall require all Local Agency crews and Subcontractors installing all materials, equipment, or products to comply with all applicable federal, state, and local laws and code regulations.
12. **Permits:** A copy of ALL permits obtained for a job, whether by the Local Agency or by a Subcontractor, shall be included in the client or project file.

Exception: If a physical permit is not available, evidence of permit (i.e. documentation of the online record) shall be in the client file (project file).
13. **Materials:** All materials used shall meet the specifications found in **Exhibit 5.S10, *Standards for Weatherization Material Specifications***.

Exception: The Local Agency shall get written approval to use alternate materials from the Commerce prior to the use of such materials.
14. **Manufacturer's requirements:** The Local Agency and Subcontractors shall conform to all manufacturers' requirements regarding installation, use and maintenance of all materials, equipment, or products installed or supplied through the weatherization program.
15. **Surface Preparation:** Surface preparation where weatherization measures are being installed (e.g., cleaning mold off window trim in order to apply caulk) shall be charged as part of the Weatherization Measure (WxM), not to the Health and Safety (H&S) budget category.
16. **Documentation:** The Local Agency shall document all requirements.
Refer to See Policy 5.1.2, *Weatherization Project Documentation* for requirements.

Weatherization Policy

See also:

[Policy 5.2.5, Targeted Residential Energy Analysis Tool \(TREAT\)](#)
[Policy 5.2.3-MF, Diagnostic Testing](#)
[Policy 9.3-MF, Indoor Air Quality – Mechanical Ventilation](#)
[Policy 9.6, Biologicals and Unsanitary Conditions, including Mold and Moisture](#)
[Exhibit 5.1.4A, Client Health and Safety Packet](#)
[Multifamily Table of Contents](#)
[Multifamily Weatherization Specification](#)

Replaces: Policy 5.2.1-MF – September 8, 2021

POLICY 5.2.1-MF MULTIFAMILY ENERGY AUDITS

The energy audit is typically considered a “process” in which an energy auditor identifies and recommends a final package of recommended efficiency opportunities to clients. In doing so, the energy auditor works with the building owner and other stakeholders to work to meet the needs of all parties involved.

1. Multifamily Energy Audits

- a. All Multifamily dwellings shall receive an, on-site, energy audit prior to receiving weatherization services.

Exception: The Local Agency Auditor may use a representative sample of dwelling units for the energy audit to meet “each dwelling unit” requirements. See **Policy 5.2.6-MF, Multifamily Representative Sample** for requirements. For each Wx project the auditor shall define and document within Wx Project file what representative sample they use.

2. Scope of Energy Audit

The Local Agency shall evaluate the dwelling for the following:

- a. Cost-effective energy efficiency improvements.
- b. Health and safety issues that may negatively affect occupants.
- c. Building durability issues that may negatively affect or prohibit installation of energy efficiency measures.
- d. Comfort issues that may cause increased energy use.
- e. **Phased Projects:** See **Policy 2.1.8-MF, Phasing Multifamily Weatherization Projects** for requirements.

3. **Multifamily Energy Auditor**

A trained and qualified auditor, someone other than the Quality Control Inspector (QCI) conducting final inspections, shall conduct energy audits and develop the Scope of Work (SOW).

Exception: Local Agencies that are unable to meet this requirement shall notify Commerce in writing with their alternative inspection plan and receive Commerce written approval.

- a. Shall be certified as Building Analyst (BA), Building Analyst Technician (BA-T), Energy Analyst (EA) or Quality Control Inspector (QCI) by the Building Performance Institute (BPI). In addition to the Home Energy Professional certification, Multifamily auditors shall also receive the supplemental Multifamily training and pass the test.
- b. Training and testing is available from the Peer Circuit Rider/Building Performance Center.
- c. Newly hired auditors shall have work reviewed including on-site review by a certified BA, BA-T, EA, or QCI until such time that they become certified.

4. **Multifamily Energy Audit Requirements:** All multifamily energy audits will include:

- a. **Schedule:** Local Agency shall identify owner's capital improvements schedule, if available. If possible, Local Agency shall align the Wx project and owner's improvement schedules to maximize leveraged funds. See **Policy 2.1.8-MF, *Phasing Multifamily Weatherization Projects***.
- b. **Visual Assessment:**
 - (1) Air leakage control
 - (2) Insulation
 - (3) Doors and Windows
 - (4) Space-Heating and Cooling Systems
 - (5) Water Heating Systems
 - (6) Ventilation Systems
 - (7) Distribution Systems
 - (8) Controls/Scheduling
 - (9) Lighting Measures
 - (10) Appliances
 - (11) Fuel/Power and Renewable Energy

- c. **Energy Audit Tool:** The Local Agency shall:
Refer to Policy 5.2.5, *Targeted Residential Energy Analysis Tool (TREAT)*
Refer to Policy 5.2.6-MF, *Multifamily Representative Sample*
- (2) Choose one energy audit tool for each Wx project. Do not combine tools or use more than one tool, on a single Wx project.
- (a) **Approved energy analysis tool:**
- ii. TREAT - Targeted Residential Energy Analysis Tool
Refer to Policy 5.2.5, *Targeted Residential Energy Analysis Tool (TREAT)*
- A. Create an energy model in TREAT for each unique building in a Multifamily Wx project.
- B. Import or enter at least 12 months of recent energy bill data to calibrate (true up) the TREAT model.
- (b) **Priority List:**
- iii. DMPL - Deemed Measures Priority List
Refer to Policy 5.2.7, *Deemed Measures Priority List (DMPL)*
- iv. DOE-PL - Department of Energy Priority List
Refer to Policy 5.2.8, *Department of Energy Priority List (DOE-PL)*
- Exception:** Using non-DOE funding, for Weatherization Measures (WxM), the DMPL may supplement DOE-PL, if all DOE applicable mandatory measures are installed.
- d. **Diagnostic Testing:**
See Policy 5.2.3-MF, Diagnostic Testing
- e. **Combustion Safety:** Local Agency shall determine the combustion safety strategy. During the audit, Local Agency shall either confirm CO detectors are existing within dwelling units or if installing CO detectors shall be included in the scope of work. DOE requires that ALL units with a combustion appliance present shall receive pre- and post- health and safety diagnostics testing.
- Exceptions:**
- (1) Remove combustion appliances.
- (2) Isolate combustion appliance zone.
- (3) Install sealed-combustion appliances.
- f. **Indoor Air Quality – Mechanical Ventilation:** Local Agencies shall assure compliance with ASHRAE **Standard** 62.2 - 2016 for all dwelling units. Compliance with ASHRAE 62.1 - 2016 for all common space and corridors, is recommended. See **Policy 9.3-MF, Indoor Air Quality – Mechanical Ventilation**

- g. **Mold Assessment and Pollution Source Survey:** During the audit, Local Agencies shall perform a Mold Assessment and Pollution Source Survey for each dwelling unit and document occurrences, but separate forms for each unit are not required. By the end of the Wx Project, Local Agencies shall account for ALL units. Interview the maintenance staff to confirm that conditions observed in the representative sample of units actually represents the whole building and assure there are no reported Mold or Pollution Source issues.

- (1) **Mold Assessment:** See Policy 9.6, *Biologicals and Unsanitary Conditions, including Mold and Moisture.*

- (2) **Pollution Source Survey:** Local Agencies shall document justification for installation of a particular health or safety measure in a project with a note in the Scope of Work. See **Exhibit 5.1.4A, Client Health and Safety Packet –Part 3: Pollution Source Survey** and **Part 4: Resource Guide to Pollution Source Survey Home Rating Scale.**

Example: Condition #3 – **Plumbing Leak inside the home or in the crawl space**, with a **Rating 3 = Current Major Leak** is noted in Plumbing Repairs measure.

- h. **Energy Consumption:** Through the energy model, the Local Agency shall use utility billing and energy consumption to true up the computer model in the energy audit tool.

- (1) **Acquire Residential Energy Use (billing information) data:** Request utility billing from building owner, utility, or each tenant.

- (a) **Building Energy Use:** Request utility billing from building owner or from utility with release from building owner for the entire building energy use. *Recommended: EPA Portfolio Manager may be a useful tool.*

- (b) **Dwelling Unit Energy Use:** Collect all billing data from each tenant or use building compilation from owner.

- (2) *Recommended: Building Energy Use Comparison (Benchmarking)*
Published document from NEEA: Residential Building Stock Assessment: MF characteristics and end use Dec 2013. To assist in prioritizing projects, rather than to HREU/B – if a building is a high energy user, the comparison will help determine it. To help convince owners to do work.

- i. **Lighting audit:** Local Agencies shall determine the lighting strategy for dwelling units, common areas interior, and exterior. Model lighting energy use in TREAT. Use Energy Star or equivalent energy use lighting fixtures and lamps.

- j. **Cost Estimate** – *Recommend using RS Means to compare to contractor bids.*

- k. **Subcontract:** As necessary for design new systems and assessment of current systems, subcontract with engineers (design professionals), licensed contractors, or specialty technicians.

5. **Review of Energy Audit Report and Scope of Work**

The Local Agency shall provide an Energy Audit report to the owner (owner's agent). Local Agency shall review the energy audit findings of the energy audit and the anticipated scope of work with the building owner or representative.. Documentation of the audit findings and anticipated scope of work shall be retained in the project file. Local Agency shall coordinate with the dwelling owner to ensure tenants are properly notified of the anticipated scope of work.

Exception: Low-cost/No-cost measures may be installed before audit findings are reviewed with the occupants and landlord.

6. **Historical preservation considerations**

All energy audits shall note any historical preservation requirements and shall consider these requirements when determining the scope of work that will be used to complete weatherization work on the dwelling unit.

7. **Owner Authorization**

For all work the Local Agency conducts, the Local Agency shall obtain the building owner's (or owner's agent) signature authorizing installation of the measures to be performed on the eligible dwelling prior to work commencing. A copy of the signed authorization shall be retained in the client file (project file). The Local Agency shall coordinate with the dwelling owner to ensure tenants are properly notified to allow access for installation of measures and necessary inspections.

- a. Owner/Agency Agreement – Signed approval: See **Policy 1.3.3, Using Owner/Agency Agreements** and **Exhibit 1.3.3B, Wx Program Rental Property Owner/Agency Agreement**.
- b. Owner Contribution: See **Policy 1.4.2, Owner Contributions**.
- c. Owner Maintenance Schedule: See **Policy 2.1.8-MF, Phasing Multifamily Weatherization Projects**.

8. **Deferral:** Deferral may be necessary if there are any problems beyond the scope of the Weatherization Assistance Program. See **Policy 5.1.3, Deferral Standards**.

9. **Client Education:** Local Agency shall provide Weatherization information to all clients. See **Policy 5.1.4, Client Education** for requirements.

10. **Documentation:** See **Policy 5.1.2, *Wx Project Documentation*** for requirements. The Local Agency shall document all Energy Audit requirements, including audit inputs verification and measure justification. This documentation includes, but is not limited to:

- a. **Existing Condition:** Local Agency shall record a description of the condition of the home at the time of the energy audit and justification for the measures as outlined in the scope of work.

Exception: A complete energy audit is not required, if during the energy audit assessment it is determined the best course of action is to defer Wx service per Commerce policy **Policy 5.1.3, *Deferral Standards***.

- b. **Photographic record:** Photographs can provide sufficient documentation for pre-Wx data collection and justification for measures. See **Policy 5.1.2, *Weatherization Project Documentation***, *Section 15 Photographic Documentation* for requirements.
- c. **Energy Audit Report**
- d. **Scope of Work**
- e. **Representative Sample:** Description and explanation of Representative Sample technique compliance, and
- f. **Wx Project strategies:** Any other applicable Wx Project strategies.

Weatherization Policy

Replaces: NEW

See also:

[Policy 5.2.6-MF, Multifamily Representative Sample](#)[Policy 5.1.2, Weatherization Project Documentation](#)

POLICY 5.2.3–MF MULTIFAMILY DIAGNOSTIC TESTING

1. **Testing Prior to Weatherization:** Local Agency shall perform or contract to perform diagnostic testing on dwelling units prior to installation of weatherization measures and upon completion of each project. All results from testing shall be documented in the project file. See **Policy 5.2.6-MF, Multifamily Representative Sample** for the allowed sampling technique.
2. **Air Leakage Evaluation:** All projects shall include at a minimum, shall include a visual observation for air leakage. A blower door test is not required in multifamily construction. If blower door testing is completed either a qualitative or a quantitative observation should be documented.
 - a. **Qualitative Evaluation:** Qualitative observations include visual inspections, the use of zonal pressure readings (manometer), air current testers (smoke), infrared thermography, etc. to evaluate envelope leakage and enclosure performance.
 - b. **Quantitative Testing:** Quantitative testing includes calibrated, induced-pressure tests to evaluate envelope leakage and enclosure performance.
3. **Blower Door Testing:** Blower door testing is optional and left to the discretion and expertise of the auditor. When completing blower door testing on multifamily buildings see **Policy 5.2.6-MF, Multifamily Representative Sample** for the allowed representative sampling technique.
 - a. **Whole Building Blower Door Testing:** When whole building blower door testing is performed, a depressurization test shall be performed in accordance with **ASTM E779-10: Standard Test Method for Determining Air Leakage Rate by Fan Pressurization**.
 - (1) Multiple Blower Doors on multiple units
 - (2) All doors open with a large Blower Door on main entrance door

b. Localized Unit Testing:

- (1) **Guarded Test:** When localized dwelling unit blower door tests are performed, take steps to quantify or nullify measured leakage between dwelling units vs. leakage to outside if test results will be used to estimate energy savings from air sealing measures. To run a guarded test, set up blower doors in all of the surrounding units to maintain equal pressure.
 - (2) **Unguarded Test:** Localized dwelling unit blower door tests, without efforts to nullify leakage between dwelling units can be performed when the results are used to assess the compartmentalization of the dwelling unit. When unguarded blower door testing is performed agencies shall follow manufacturer's recommendations.
4. **Air Sealing Defaults (without Blower Door Testing):** Since blower door testing is optional, default air leakage values may be used. However, without blower door testing the amount of air sealing work you can justify may be limited because the default numbers for prescriptive air sealing work are conservative.
 - a. Defaults for Prescriptive Air Sealing:
 - (1) Air exchange default for existing building remain 0.6 ACH, reducing not more than 50%. The auditor is allowed to adjust this default if they need to change it to true up the model.
 - (2) Attic and crawlspace only, prescriptive air sealing (no blower door testing) default for improvement is a conservative 0.05 reduction or 0.55 ACH for calculating the SIR of infiltration reduction measure.
 - (3) Attic, crawlspace, band joist and dense pack wall insulation plus prescriptive air sealing default infiltration reduction of 35% (0.4 ACH*). **Based on PSE pilot.*
Exception: For mid- and high-rise buildings auditor will use their judgement to estimate air sealing reductions.
5. **Duct Systems Testing:** Evaluation of duct system is mandatory when ductwork extends through unconditioned spaces.
Exception: Ducted rooftop equipment that has short runs of ductwork outside the envelope should be visually inspected for leaks and any leaks found should be sealed but are otherwise exempt from these requirements.
 - a. Duck leakage sites will be identified using industry approved approaches. Example include; visual inspections, borescopes, remote cameras, infrared thermography, smoke, and/or pressure tests.

- b. Pressure pan testing shall be completed when applicable. When the Local Agency is not able to complete pressure pan test, the reason shall be documented in project file.
- 6. **Zonal Pressure Testing:** Zonal pressure testing is optional and left to the discretion and expertise of the auditor.
 - a. Airflow migration that affects odor migration and energy load transfer in a building is quite complicated and cannot typically be modeled, as the required modeling is so complex. Sometimes pressure differential readings between areas of a building can assist in analyzing likely airflow migration paths, but such airflow diagnostics may also be complicated. Airflow and air migration diagnostics are part art and part science, as migration flow paths often are complicated.
 - b. Zonal pressure diagnostics are typically applied in single-family dwellings, but in multifamily, building size, often limited access to dwellings, and potentially complex flow paths make it difficult to know when a stopping point is reached.
- 7. **Documenting Testing Methodology:** Local Agencies shall document the testing methodology in the project file. See **Policy 5.1.2, *Wx Project Documentation*** for requirements

Weatherization Policy

See also:

[Weatherization Program Notice \(WPN\) 22-7 Weatherization Health and Safety Guidance](#)
[Weatherization Assistance Program Technical Assistance Center \(WAPTAC\)](#)

Replaces: NEW MF

POLICY 5.2.6-MF MULTIFAMILY REPRESENTATIVE SAMPLE

Purpose: Auditing, testing, and inspecting each dwelling unit in a multifamily building is typically difficult. Instead, the Multifamily Representative Sample Policy allows Local Agencies to use an example of units or spaces for large multifamily buildings (five (5) units or more), in some instances. However, understanding the building is the primary objective. Before conducting the energy audit, the potential need for sampling shall be determined.

1. **Using a Representative Sample:** Local Agencies may use a representative sample in multifamily buildings with five (5) or more units, instead of auditing, testing, and inspecting each dwelling unit if the examples provide an accurate understanding of the building or multiple buildings.
2. **Defining the Representative Sample:** The Representative Sample depends on the size of the building(s), potential issues with tenant dwelling access, HVAC systems, and cost implications. The Representative Sample shall include a minimum of one (1) each Unique Space plus the additional number of units to meet the minimum Unit Rate.
 - a. **Unique Space:** Local Agencies shall identify and group spaces that have similar energy-use characteristics. Examples include dwelling units, lobbies, mechanical rooms, attics, hallways, stairways, rooftops, etc. Each dwelling unit floor plans type (e.g. 1 bedroom, 2 bedroom, etc.) are unique spaces and are in separate groups.
 - b. **Unit Rate:** Local Agencies shall calculate the minimum number of dwelling units in accordance with the following table:

Sample Dwelling Unit Rate Table	
Building Size Total number of Units	Number of Units in Sample (Minimum Sample Total)
5 - 19	3
20-29	4
30-49	5
50 and greater	10%

- c. **Increase Sample Unit Rate:** It is at the discretion of the auditor to determine if the minimum sample unit rate is not enough units to understand the building and to increase the number of example units in the representative sample, as needed.

d. Choosing Dwelling Units for Representative Sample:

- (1) **Different Unit Floor Plans:** The representative sample shall contain a minimum of one (1) unit of each different floor plan.

Examples: studio, one (1) bedroom, two (2) bedrooms, three (3) bedrooms, etc.

- (2) **Different Heating, Ventilation and Air Conditioning (HVAC) Systems:** The representative sample shall contain a minimum of one (1) unit with each different HVAC system.

Examples: electric baseboard, steam radiant heat, local exhaust fan, centralized rooftop exhaust, etc.

- (3) **Multiple buildings:** In a complex of multiple buildings, the representative sample shall contain a minimum of one (1) unit from each different building.

- (4) **Owner/Agent Interview:** Use the interview with owner or agent to help determine the representative sample (e.g. heating systems, ventilation system.)

- (5) **Proportional (Recommended):** The auditor should do their best to choose a number of unit types proportional to their occurrence in the building.

Example: In a 100 unit building the Sample Unit Rate is 10% or 10 units. With 70 three-bedroom units and 30 two-bedroom units, the auditor should try to choose seven (7) three-bedroom units and three (3) two-bedroom units.

- (6) **Surface Area Exposure (Recommended):** The auditor should do their best to choose units with varied surface area exposures to the outside.

Example: Each unit surface area exposure to outside might range from one to five surfaces, including: top-floor-level, corner-units for a roof-surface and two-wall-surface exposures; bottom-floor-level, corner-units for a floor-surface and two-wall-surface exposures; middle-floor-level, corner-units for two-wall-surface exposures; top-floor-level, middle-units for a roof-surface and one-wall-surface exposure; bottom-floor-level, middle-units for a floor-surface and one-wall-surface exposure; and middle-floor-level, middle-units for only one-wall-surface exposure.

- (7) **Orientation (Recommended):** The auditor should do their best to choose units with varied orientations: North, South, East, and West.

3. Applying a Representative Sample:

- a. **Audit:** The Energy Audit shall be performed on the representative sample to determine weatherization strategy and develop Scope of Work.
- b. **TREAT Model on Multiple Buildings:** Local Agencies may use one (1) representative building sample TREAT model for a Weatherization Project comprised of a complex of multiple buildings with the same floor plan.
- c. **Blower Door Testing:** Although Blower door testing for Multifamily buildings is optional, if you are conducting blower door testing the following representative sample is recommended:
 - (1) For low-rise (3-stories or less) smaller buildings it is recommended to test approximately 10% (or 3 minimum) of the units within each set of unit types with a similar floor plan. If the representative sample shows widely different (15%) leakage rates or different leakage points, additional units should be tested until the auditor is satisfied there is a good assessment of location of air leaks and can specify how the unit can be effectively air sealed.
 - (2) For high-rise (4-stories or more) larger buildings a more subjective approach can be taken with the goal of determining where significant air leakage points are located and how the unit can be effectively air sealed. Air leakage testing standards usually do not apply directly for large multifamily buildings, as a combination of methods is needed to estimate air leakage effects, and allowable budget for diagnostics limits testing rigor. The auditor shall document the sampling approach in the project file. *For more information see ASHRAE's compartmentalization test. (50 pa test)*
- d. **Verifying, Certifying, or Inspecting Installed Measures:** Local Agencies shall validate and document subcontractor's work performed prior to paying them.
 - (1) **Verifying Measures:** Local Agencies shall confirm work is complete and verify work is appropriate and allowable.
 - (2) **Certifying Measures:** Local Agencies shall certify work is performed in compliance with the Wx Field Guide and in a quality manner. This may include required testing out. See Section **4b. Functional Performance Test Required** (below).
 - (3) **Inspecting Measures:** Measures installed in the field require a final or an in-progress inspection by a qualified Quality Control Inspector (QCI).
 - (a) **In-progress inspections** may suffice as final inspection on the measure if conducted by a qualified QCI.

(b) **Final Inspection:** At final inspection, QCI need not visit every unit if:

- i. In-progress inspections suffice. All measures installed in dwelling units receive and pass in-progress measure inspections by a qualified QCI.
- ii. All installed equipment measures receive and pass functional performance testing. Final inspector may use the representative sample to verify these tests of the commissioned equipment. However, if issues arise with test out documents, the sample will be doubled. If additional issues arise, 100% of inspections shall be performed.
- iii. No individual measures were installed within units.

4. **Prohibiting a Representative Sample:** The use of a representative sample is not allowed for the following:

- a. **Health and Safety:** At some point during each project, all units shall have a documented inspection for possible health and safety concerns, including diagnostics if appropriate, followed by work orders for correction.

(1) **Combustion Appliances:** DOE requires that ALL units with a combustion appliance present shall receive pre- and post- health and safety diagnostics testing.

Exceptions:

- (a) Remove combustion appliances.
- (b) Isolate combustion appliance zone.
- (c) Sealed-combustion appliances.

(2) **Pollution Source Survey and Mold Assessment:** Local Agencies shall conduct a pollution source survey and mold assessment on 100% of the units over the course of the project. These assessments may be performed at pre-assessment, pre-audit, audit, in-progress inspections, final inspections, or any combination.

- b. **Functional Performance Test Required:** For all newly installed or modified equipment or systems, 100% testing out by a qualified testing agent conducting a Functional Performance Test is required. Representative sampling is not an allowable practice for testing out. See **Policy 9.3-MF, Indoor Air Quality – Mechanical Ventilation**.
- c. **DOE Units:** No DOE dwelling unit will be reported to Commerce as closed until the local agency has performed a 100% final inspection and certified that appropriate work has been completed in a quality manner.
- d. **Documenting Representative Sample:** Local Agencies shall document in the project file, the representative sample methodology, when and where it was applied, and the specific sample units used within the Representative Sample. See **Policy 5.1.2, Weatherization Project Documentation** for requirements.

Weatherization Policy

Replaces: Policy 5.3.1 – January 1, 2021

See also:

[Policy 1.4.2, Owner Contributions](#)
[Policy 5.2.6-MF, Multifamily Representative Sample](#)
[Standard Work Specifications \(SWS\)](#)

POLICY 5.3.1-MF MULTIFAMILY AIR SEALING - ATTACHED BUILDINGS

1. **Effective Air Sealing:** Local Agencies shall perform air sealing on all Multifamily weatherization projects:

Exceptions: Air Sealing methods and amount performed can be limited if:

- a. It creates a CAZ issue, or
- b. There is ACM or assumed ACM issues.

2. **Air Sealing Locations:** Air sealing shall be performed at the following locations:

- a. **Between Conditioned and Unconditioned Spaces:** Air seal the building envelope including the heating or cooling duct system, at the pressure boundary and align it with the thermal boundary as defined by a competent energy auditor. *For more information, refer to MF SWS 3.1001.5 through 3.1502.2 for best practice techniques.*

Exception: In attached buildings, where air sealing building components disrupts the combustion safety protocol. However, If the combustion safety protocol calls for air sealing walls, floors and or ceilings, the surface shall be made airtight in compliance with the combustion safety protocol. *For more information, refer to MF SWS 2.0204.2 for best practice techniques.*

- b. **Between Units:** Measures shall be taken to minimize air movement across envelope components separating dwelling units, including sealing accessible penetrations in the common walls, ceilings, and floors of each unit and by sealing vertical chases adjacent to the units.

- c. **Between Units and Common areas:** All doors between dwelling units and common hallways shall be gasketed or made substantially airtight.

Exceptions:

- (1) Original building design and ventilation system design will not allow this. Work will preserve existing ventilation system, including apartment door undercuts, to allow a pathway for ventilation from hallways to apartments. *For more information, refer to MF SWS 3.1901.2d for best practice techniques.*
 - (2) If you are altering the original building design and ventilation system, ensure compliance with building and fire codes.
- d. **Firewalls and Draft Stops in Unconditioned Attics:** The auditor shall identify any obvious pre-existing holes in firewalls and draft stops. Any holes or penetrations that can be sealed as part of air sealing shall be included in the weatherization project. However, the auditor shall use sound judgement to determine the severity of the needed repairs and determine when the repairs are too expansive for the weatherization program. *For more information, refer to MF SWS 3.1001.6 and 3.1001.7 for best practice techniques.*

(1) Determining Repair Responsibility:

- (a) **Owner:** Any pre-existing damage beyond the scope of the weatherization program is the owner's responsibility to repair. The owner, owner's representative, or both shall be informed of the need for repairs to the firewalls and draft stops. See **Policy 1.4.2, Owner Contributions** for more information.
- (b) **Local Agency:** If the firewall/draft stop will be damaged or is accidentally damaged during weatherization work then the local agency is required to repair the firewall/draft stop back to pre-weatherization work condition.

(2) Determining Fire-resistance Ratings:

- (a) **Drawings available:** Where drawings are available that identify specific fire-resistance ratings (i.e. 1 hour, 2 hour), material and methods will be employed to preserve or restore such ratings.
- (b) **Drawings unavailable:** Where drawings are unavailable or do not specify fire-resistance ratings, the fire resistance rating of the assembly may be inferred from the current construction.

e. Optional Locations:**(1) Concrete Floor Slab Foundation**

For more information, refer to MF SWS 3.1403 for best practice techniques.

(2) Covers for Sump Pumps, Drains, Pits and other Intentional Slab Penetrations. *For more information, refer to MF SWS 3.1488 for best practice techniques.***3. Compartmentalization:** Local Agencies shall minimize transfer air between units (See Section 2b) and between units and common area (See Section 2c) as required by **ASHRAE Standard 62.2-2016**. Depending on the building design, current condition, retrofit cost and auditor's evaluation compartmentalization is allowable. When using compartmentalization follow these guidelines.

a. **Verify Leakage Rate:** One method of demonstrating compliance with the Transfer Air requirements above shall be to verify a leakage rate below a maximum of 0.3 cfm per ft² (100L/s per 100 m²) of the dwelling unit envelope area (i.e., the sum of the area of walls between dwelling units, exterior walls, ceiling, and floor) at a test pressure of 50 Pa by a blower door test conducted in accordance with either ANSI/ASTM-E779, *Standard Test Method for Determining Air Leakage Rate By Fan Pressurization*. The test shall be conducted with the dwelling unit as if it were exposed to outdoor air on all sides, top, and bottom by opening doors and windows of adjacent dwelling units.

b. **Visual Inspection:** Another method of compliance with the Transfer Air requirements above is visual inspection and documentation. Local Agencies may use tools and methods such as, a smoke pen, blower door pressurization or depressurization, and an infrared (IR) camera to enhance the visual feedback. *For more information, refer to MF SWS 3.1901 for best practice techniques.*

4. Materials – Sealant Selection

a. Sealants will be compatible with their intended surfaces and applied in accordance with manufacturer specifications.

b. Selection will be durable, pest resistant, and have a weather-appropriate seal.

c. Indoor sealants are encouraged to be low volatile organic compound (low-VOC) products that at a minimum meet one of the following standards:

(1) Master Painters Institute Green Performance Standard

(2) Green Seal

- (3) UL Environment Ecologo
 - (4) Environmental Protection Agency
 - (5) US Green Building Council's Leadership in Energy and Environmental Design (LEED)
 - (6) GREENGUARD (UL Environment)
 - (7) South Coast Air Quality Management District (AQMD)
 - d. Fire-resistance-rated assemblies will be provided with sealants permitted by the authority having jurisdiction and adopted building code.
 - e. Sealants include, but are not limited to:
 - (1) Dense Pack wall insulation
 - (2) Two Part Form
 - (3) Caulking
 - (4) Liquid Flashing Membrane
 - f. Installation Standards
 - (1) Good ventilation
 - (2) Air seal from crawl or attic, if possible
5. **Air Sealing Attached Buildings using Dense Packing:** If a housing unit is attached to another housing unit, air sealing between conditioned and unconditioned space is cost-effective if performed by a competent installer. Local Agencies installing dense packing to air seal, shall comply with the following:
- a. Dense pack wall insulation, even in cavities that already have insulation and air seal every penetration through the envelope.
 - b. If the auditor suspects the building is too tight, a blower door test shall confirm this condition. The blower door test result below 0.6 ACH50 to be considered too tight.
 - c. A representative sample of buildings types shall be tested by a competent technician. See **Policy 5.2.6-MF, Multifamily Representative Sample** for requirements.
 - (1) The competent multifamily blower door technician shall be independent of the multifamily air seal contractor.

- (2) An equal number of buildings shall be tested at the end of air sealing work. It is the choice of the agency which buildings shall be tested. If the buildings do not show a reduction of leakage of 25%, that work is failed and work shall continue until airleakge reduction exceed 25%.
 - d. Quality assurance of multifamily air sealing shall be realized with periodic spot inspections to test materials used, equipment operation, and verification of air seal work.
 - (1) Air sealing in-progress inspections can include smoke tests, blower door tests, or infrared scans.
 - e. Air seal materials will be consistent with existing or intended fire-resistance assemblies. Seals will be used that prevent visible air movement using chemical smoke at 50 Pascal's of pressure difference.
 - f. Dense pack wall and rim joist shall be performed to the specifications.
 - g. Agency shall have the permission of the building owner to install wall insulation before proceeding.
 - h. The finish of the wall drilled through for dense pack insulation shall match the finish condition of the wall. Approval of the finish of the wall plugs is required by the Building Owner or Owner representative. Documentation of this approval shall be in the project file.
6. **Air Sealing High-Rise Buildings (4-stories or more):** Local Agencies air sealing high-rise buildings shall comply with a prescriptive priority list, as follows:
- a. **Top of Building:** Seal the Top of the building, including attic floors, mechanical rooms and elevator shafts.
 - b. **Bottom of Building:** Seal the bottom of the building including building entrances, leakage between bottom floor apartment and outdoors and the lower grade core of the building and the parking garage.
 - c. **Vertical Shafts:** Seal the vertical shafts; this will prevent air movement through and eventually out of the building. These are should have been sealed to ensure the integrity of fire separations, but renovations and repairs often open up gaps.
 - d. **Outside Walls and Openings:** Seal outside walls and openings.
 - e. **Compartmentalize:** Seal apartments from common areas, adjacent apartments, stairwells, service areas and common corridors and shafts.
7. **Documentation:** The Local Agency shall document all air sealing requirements. See **Policy 5.1.2, Weatherization Project Documentation** for requirements.

Weatherization Policy

See also:

[Weatherization Program Notice \(WPN\) 22-7 Weatherization Health and Safety Guidance](#)[Exhibit 9.3, Mechanical Ventilation Worksheet](#)[Policy 9.3, Indoor Air Quality - Mechanical Ventilation](#)[Policy 5.2.6-MF, Multifamily Representative Sample](#)[ASHRAE 62.2-2016 – Residential Energy Dynamics \(RED\) Calc Tool](#)[Policy 5.1.4, Client Education](#)[Policy 5.1.2, Weatherization Project Documentation](#)

Replaces: Policy 9.3 – July 2017

POLICY 9.3-MF MULTIFAMILY INDOOR AIR QUALITY - MECHANICAL VENTILATION

Purpose: The ASHRAE Standards, *Ventilation and Acceptable Indoor Air Quality* define the roles of, and minimum requirements for, mechanical and natural ventilation systems and the building envelope intended to provide [Acceptable Indoor Air Quality](#) (IAQ) in residential buildings.

1. Ventilating Multifamily Buildings:

- a. **Ventilating Dwelling Units:** The Local Agency shall comply with *ASHRAE Standard 62.2 – 2016* including *Appendix A: Existing Buildings* to provide mechanical ventilation to alleviate excess moisture and the buildup of indoor pollutants for dwelling units within multifamily buildings, when performing weatherization activity.

Exceptions:

- (1) Multifamily dwelling unit ventilation on/off switches do not have to be readily accessible to the occupant.
 - (2) Rooftop exhaust fans may use more than 50 watts.
 - (3) Garage ventilation requirements do not apply to multifamily buildings. Parking garage ventilation systems should be operated on a demand basis controlled by a CO detector.
- b. **Ventilating Common Areas:** The Local Agency Auditor shall evaluate the need for common area ventilation (e.g. stale air, odors, poor indoor air quality, mold, etc.) within multifamily buildings, when performing weatherization activity.
 - (1) **Existing Common Area Ventilation System:** The auditor shall evaluate the existing system for adequate ventilation. When in the opinion of the Auditor ventilation is not adequate, then repairs or replacement shall be part of the scope of work.

(2) **No Existing Common Area Ventilation System:** If the auditor deems adding a ventilation system is needed, physically possible due to building construction or design, and financially feasible a common area ventilation system shall be installed.

(a) **Installing:** When common area ventilation systems are designed or installed, compliance with *ASHRAE 62.1-2016* is recommended.

Exceptions:

- i. Ventilation systems designed by a professional licensed engineer.
- ii. Ventilation systems using a pressurized or depressurized strategy with undercut doors;
- iii. Historic preservation and maintaining the property on the historic register.

(b) **Not Installing:** When an Auditor deems a common area ventilation system is not required or not feasible then the reason for not installing the system shall be documented in the project file.

2. Calculating Multifamily Ventilation:

- a. **Calculating Dwelling Unit Ventilation(Blower Door Test Required):** The Local Agency shall ensure completion of Mechanical Ventilation Worksheet, pre- and post-weatherization, documenting compliance with *ASHRAE Standard 62.2 – 2016 Ventilation and Acceptable Indoor Air Quality in Low-Rise Buildings (Appendix A: Existing Buildings)*. See **Exhibit 9.3, Mechanical Ventilation Worksheet**. Representative Sample technique per **Policy 5.2.6-MF, Multifamily Representative Sample** is allowed.

Exceptions:

- (1) **ASHRAE Standard 62.2 – 2016 – Residential Energy Dynamics (RED) Calc Tool:** If RED is used, Commerce may ask Local Agencies for calibration to assure consistent results with **Exhibit 9.3, Mechanical Ventilation Worksheet**.

(2) **ASHRAE Standard 62.2 – 2016 – Table 4.1a (I-P) Ventilation Air**

Requirements, cfm: Using this table will result in higher ventilation levels as it is a more general approach and relies on more conservative values, than calculating ventilation for specific units.

TABLE 4.1a (I-P) Ventilation Air Requirements, cfm

Floor Area, ft ²	Bedrooms				
	1	2	3	4	5
<500	30	38	45	53	60
501–1000	45	53	60	68	75
1001–1500	60	68	75	83	90
1501–2000	75	83	90	98	105
2001–2500	90	98	105	113	120
2501–3000	105	113	120	128	135
3001–3500	120	128	135	143	150
3501–4000	135	143	150	158	165
4001–4500	150	158	165	173	180
4501–5000	165	173	180	188	195

(3) **ASHRAE Standard 62.2 – 2016 – Formula**

$$Q_{tot} = 0.03A_{floor} + 7.5(N_{br} + 1)$$

- b. **Calculating Dwelling Unit Ventilation (No Blower Door Test Performed):** The Mechanical Ventilation Worksheet is prohibited if the blower door testing is not performed (e.g. vermiculite, asbestos tape, etc.) The infiltration credit is not allowed without the blower door test results.

When no blower door test is performed, Local Agencies shall use the **ASHRAE TABLE 4.1a (I-P) Ventilation Air Requirements, cfm** or the ASHRAE calculation formula, as noted in *Section 2a Exceptions (2) and (3)* (above).

- c. **Calculating Common Area Ventilation:** When local agencies are adding or upgrading common area ventilation, the following are recommended:

- (1) Adhere to the standards of **ASHRAE Standard 62.1 – 2016**.
- (2) Consult a licensed mechanical engineer for ventilation strategies and design. Engineer's expenses for evaluating and designing ventilation systems is an allowable expense.

3. **Dwelling Unit Mechanical Ventilation Required:** Dwelling Unit mechanical ventilation is required to comply with *ASHRAE Standard 62.2-2016* including *Appendix A: Existing Buildings*.

Exception: Dwelling Unit ventilation is not required when Q_{fan} is less than or equal to 15 cfm.

a. **Dwelling Unit Ventilation System Types**

A mechanical exhaust system, supply system, or combination thereof shall be installed for each dwelling unit to provide Dwelling Unit ventilation.

- (1) The Dwelling Unit ventilation system shall consist of one or more supply or exhaust fans and associated ducts and controls.
- (2) Local exhaust fans shall be permitted to be part of a mechanical exhaust system.
- (3) Outdoor air ducts connected to the return side of an air handler shall be permitted as supply ventilation if manufacturer's requirements for return air temperature are met.

b. **Dwelling Unit Fan Requirements**

(1) **Existing fans:**

Existing fans providing Dwelling Unit ventilation (in part or in whole) are exempt from any sound rating (*ASHRAE Standard 62.2 – 2016*, Appendix A, Section 4.1).

(2) **Newly installed fans:**

Fans installed to provide Dwelling Unit ventilation shall have a sound rating of 1.0 sones or less as determined by the Home Ventilation Institute (www.hvi.org/)

Exception: Air handlers, HRV/ERVs, inline fans and remote mounted fans are exempt from sound rating requirements if mounted a minimum of four (4) feet from the grill.

c. **Control of Dwelling Unit Mechanical Ventilation**

For multifamily dwelling units, the manual ON-OFF control is not required to be readily accessible. Controls shall include text or an icon indicating the system's function.

4. **Local Exhaust in Kitchens:** A working exhaust fan shall be present in kitchens where a gas combustion range, cooktop, or oven is present.

a. **Ventilation level**

A kitchen exhaust fan installed by the local agency shall be Heating Ventilation Institute (www.hvi.org/) rated to deliver a minimum of 100 cfm intermittent at 0.25 inches water gauge or five (5) air changes per hour continuous. Kitchen exhaust fans shall be rated for sound at a maximum of 3.0 sones, unless their maximum rated airflow exceeds 400 cfm. When existing equipment does not meet this requirement the Dwelling Unit ventilation rate may be adjusted to overcome the deficit.

b. **Fan rating**

Exhaust fans installed directly over a range or oven shall be rated for installation in this location.

c. **Kitchen fan control**

Kitchen fans shall be controlled by the manufacturer's switch or a wall mounted switch.

5. **Local Exhaust in Bathrooms:** A bathroom exhaust fan installed by the Local Agency shall be rated to deliver a minimum of 50 cfm intermittent at 0.25 inches water gauge or 20 cfm continuous. When existing equipment does not meet this requirement the Dwelling Unit ventilation rate may be adjusted to overcome the deficit.

a. **Sound rating:**

Exhaust fans installed by local agency:

(3) Intermittent: 3.0 sones or less

(4) Continuous: 1.0 sone or less

b. **Energy use**

Exhaust fans installed to provide local bathroom exhaust shall have an operating watt draw of 50 watts or less.

c. **Bathroom fan control**

A readily accessible manual ON-OFF control shall be provided for each demand controlled mechanical exhaust system. For multifamily dwelling units, an automatic control device shall be permitted to override manual OFF control, provided that it does not override manual ON control. Examples include, but are not limited to: humidity sensors, shut-off timers, occupancy sensors, multiple-speed fans, combined switching, IAQ sensors, etc.

6. **Crawlspace and Garage Ventilation:** Exhaust fans may be installed for operation in crawlspaces or garages to exhaust pollutants and maintain a pressure boundary relative to the dwelling unit(s). Fans installed shall be rated for continuous use. Ventilation flows shall not be included in the ASHRAE 62.2 mechanical ventilation calculation. Ducts in the garage and ducts penetrating the walls or ceilings separating the dwelling from the garage shall be constructed of a minimum 26-gauge sheet steel and shall have no openings into the garage.

a. **Sizing crawlspace and garage fans**

Local Agency shall size the fan to maintain negative pressure relative to the dwelling unit during normal operating conditions.

b. **Crawlspace and garage fan controls**

Exhaust fans installed in crawlspaces shall be wired to exhaust continuously with a switch near the fan to allow shut down of fan for maintenance.

c. **Verification of fan performance**

Local Agency shall verify that fan performance during normal operating conditions creates a negative pressure with reference to the dwelling unit.

d. **Fan rating**

Fans installed for the purpose of maintaining a pressure boundary shall be rated for continuous operation.

e. **Fan termination point**

Fans installed for the purpose of maintaining a pressure boundary shall not terminate within five (5) feet of a door, window, combustion appliance air-intakes, or fresh air intakes.

7. **Ventilation System Performance Testing:**

- a. **Airflow Measurement:** The airflow required is the quantity of indoor air exhausted or supplied by the ventilation system as installed and shall be measured according to the ventilation equipment manufacturer's instructions, or by using a flow hood, flow grid, or other airflow measuring devices at the fan's inlet terminals, outlet terminals, or in the connected ventilation duct.

Exceptions:

- (1) When performance testing of the kitchen hood is not practical or possible, one of the following methods may be used to estimate flow:

- (a) The airflow rating at a pressure of 0.25 inch wc (62.5 Pa) may be used, provided the duct sizing meets the prescriptive requirements of ***ASHRAE Standard 62.2 – 2016 Table 5.3***. If airflow ratings for the existing equipment are available at 0.1 inches wc (25 Pa) but not at 0.25 inch wc (62.5 Pa), those values may be used, provided they are reduced by 25%.

(2) Clothes dryer fans are not required to be tested.

b. Testing Requirements:

(1) Audit - Pre-Wx Project Assessment – Retro Commissioning Test:

- (a) Local Agencies' auditor shall measure airflow of existing exhaust fans during the energy audit.
- (b) Representative Sample technique per **Policy 5.2.6-MF, Multifamily Representative Sample** is allowed.

(2) Testing Out – After Installation – Functional Performance Test:

- (a) All newly installed or modified ventilation systems shall be performance tested and documented in the project file.
- (b) Representative Sample technique per **Policy 5.2.6-MF, Multifamily Representative Sample** is not allowed.
- (c) Performance testing can be completed by either:
 - i. MF Quality Control Inspector: An additional final inspection in accordance with **(3) Inspection – Post-Wx Project** is not required.
 - ii. BPI certified professional (Building Analyst, Energy Auditor, or Quality Control Inspector).
 - iii. Commissioning Agent, agents will be approved by Commerce.
 - iv. Wx professional in-training to become a Commissioning Agent.

(3) Inspection - Post-Wx Project – System Verification Test:

- (a) Local Agencies' multifamily quality control inspector (MF QCI) shall measure airflow of resultant ventilation system, including existing, modified, and newly installed ventilation equipment during the final inspection.

Exception: If qualified MF QCI performs Functional Performance Testing for 100% of the ventilation system, this in-progress inspection suffices. Ventilation system testing does not need to be repeated at final inspection.

- (b) Representative Sample technique per **Policy 5.2.6-MF, Multifamily Representative Sample** to verify Functional Performance Testing is allowed. Local Agency Inspector shall do due diligence. Any variance between inspection testing results and test out report requires inspecting a higher Representative Sample percentage to verify correct installation.
- 8. **Client Education:** Local Agencies shall provide ventilation system information to all clients. See **Policy 5.1.4, Client Education** for requirements.
- 9. **Documentation:** Local Agencies shall document ventilation strategy, calculations (MVW, RED, Table 4.1a, or formula), performance testing, and client education delivered in the project file. See **Policy 5.1.2, Wx Project Documentation** for requirements.