



WEATHERIZATION UPDATE

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This Weatherization Update is for recipients of the Low-Income Weatherization Assistance Program funding and is intended to provide information to Subgrantees on the latest issues associated with the Weatherization Program Standards as well as the latest technical information.

If you have any questions or need assistance, please contact:

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Building Tightness Limits and Ventilation Requirements

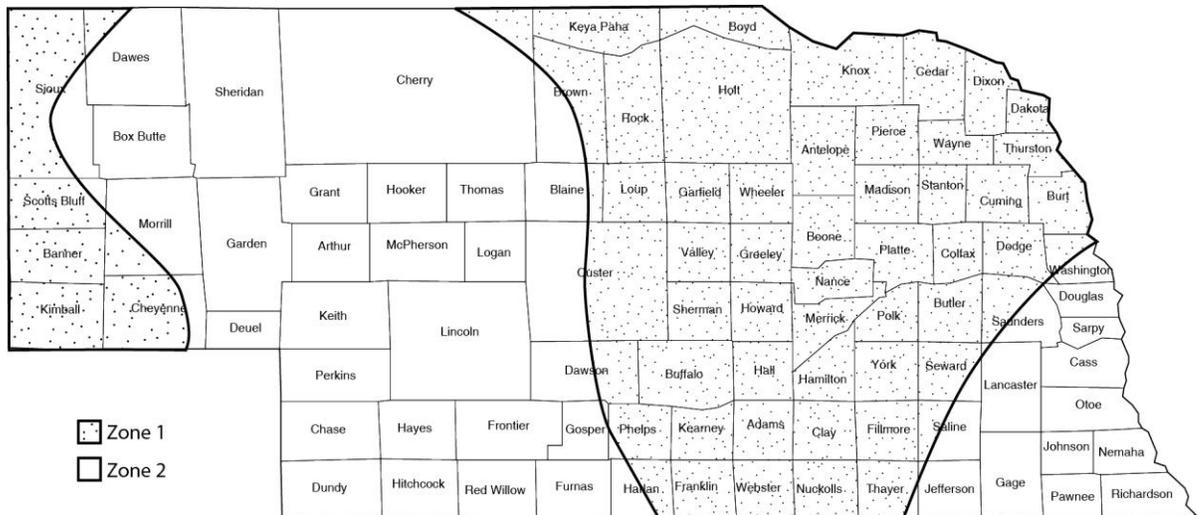
There has been a lot of discussion and questions lately among Nebraska Weatherization Program staff members regarding the calculation of, the appropriate use of, and the resolution of issues associated with a low Building Tightness Limit (BTL) in Weatherization homes. The following information should help to address some of these questions and concerns. Please provide this information to all of your agency staff members associated with the initial inspections, Quality Control inspections and/or blower door testing of homes ensure that there is no confusion regarding the requirements associated with the BTLs in the Nebraska Weatherization Program:

1. **Appropriate** BTLs **shall** be calculated for each weatherized home.
 - The Miscellaneous Health and Safety Section of the *Weatherization Installation Measures and Work Standards* states "A pre-infiltration and post-infiltration blower door test shall be performed on all homes. The blower door shall be used to identify air leakage into and out of the conditioned envelope of a structure and to determine the cost effectiveness of sealing the identified air leakage. **Building tightness limits shall be followed.**" The following information provides you and your staff with documentation to assist you in completing the required calculations to establish each home's BTL.
 - The calculated BTL value and the pre- and post-implementation blower door tests must be recorded on the Cover Page of the project BCJO. ***In the future, reimbursements will be delayed for BCJOs submitted without appropriate pre- and post-infiltration blower door test results and/or BTL limits or with post-infiltration blower door tests CFMs less than the home's calculated BTL.***
2. Do not use default BTL values.
 - As indicated above, an appropriate BTL must be **calculated** for each weatherized home. Calculation documentation is included below and in the *Weatherization Installation Measures and Work Standards*.
 - Although in the past, default or average (BTLs) have been developed in **some** states, such as 1,200 and 1,500 (cfm₅₀min values) for Minnesota and Wisconsin, respectively. These single values were never intended for use by other states, including Nebraska. They were adopted for specific conditions in Minnesota and Wisconsin which are **not** experienced in Nebraska.
3. Ventilation is **required** to be installed when a home's pre- and/or post-infiltration blower door test CFMs are lower than the calculated BTL for the home.

- As noted above, the Miscellaneous Health and Safety Section of the *Weatherization Installation Measures and Work Standards* states “**Building tightness limits shall be followed.**” This insures that the Weatherization work performed does not contribute to mold or other indoor air quality issues.
- This update is being provided as a result of:
 - a. Our review of the ventilation requirements/recommendations being made following the adoption of the latest ASHRAE 62.2 standard by other home energy retrofit programs (i.e. The Home Energy Rating System, BPI, etc.),
 - b. The planned implementation of the ASHRAE Standard in the Department of Energy (DOE) 2011 Program Year, and
 - c. This issue being experienced recently by some of Nebraska’s Subgrantees. The Continuous Ventilation Table (below) provides the fan CFM requirement using conditioned floor area of the home and the number of bedrooms.
- The costs associated with the required ventilation may be charged to Health and Safety.

CALCULATING A HOMES BUILDING TIGHTNESS LIMIT

Step 1: Find the homes climate zone on the Nebraska map.



Step 2: Match that Zone number with the same Zone number on the table.

n Factor Table					
Zone ↓	# of stories →	1	1.5	2	3
1	Well Shielded	18.6	16.7	14.9	13.0
	Normal	15.5	14.0	12.4	10.9
	Exposed	14.0	12.6	11.2	9.8
2	Well Shielded	22.2	20.0	17.8	15.5
	Normal	18.5	16.7	14.8	13.0
	Exposed	16.7	15.0	13.3	11.7

Step 3: Identify your site as well-shielded, normal or exposed.

Wind Shielding Factors	
Well Shielded -	Urban areas with high buildings or sheltered areas. Buildings surrounded by trees, bermed earth, or higher terrain.
Normal -	Buildings in a residential neighborhood or subdivision setting, with yard space between buildings. 80-90% of houses fall in this category.
Exposed -	Buildings in an open setting with few buildings or trees around. Buildings on top of a high hill or ocean front, exposed to winds.

- Step 4:** Identify the column for your building’s number of stories. Since there is little infiltration except through the top portion of basements, generally they should not be included in the number of stories. In the case of walkout basements a .5 should be added to the number of stories.
- Step 5:** Follow that column down to where it meets the row corresponding to your climate zone and shielding to find the home’s *n* factor.
- Step 6:** Find the Building Tightness Limit (BTL), using the formula listed below:

BTL(cfm50 minimum) = Whichever of the following is greater (# of occupants or [the # of bedrooms +1]) + (the # of naturally aspirating appliances that get combustion air from inside the building envelope) x (*n*) factor x15cfm

- Consider adding another occupant or two for each person in the home that smokes.
- Regardless of the calculated limits, air sealing shall not be undertaken if the house has an indoor air quality problem that has not been fixed or cannot be remedied.

If Required

- Step 7:** Install Continuous Ventilation as per the following table if a home’s pre- and/or post-infiltration blower door test CFMs are lower than the calculated BTL for the home.

Continuous Ventilation

Ventilation Air Requirements, CFM					
Floor Area	Bedrooms				
(ft ²)	0-1	2-3	4-5	6-7	>7
<1500	30	45	60	75	90
1501-3000	45	60	75	90	105
3001-4500	60	75	90	105	120
4501-6000	75	90	105	120	135
6001-7500	90	105	120	135	150
>7500	105	120	135	150	165

Table is a duplicate of Table 4.1a (I-P) for Minimum Ventilation from the ANSI/ASHRAE Standard 62.2 – 2010 for Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings.