

Duct Sealing Guidance

Ducts inside the building envelope

Site built home

1. A visual inspection of all accessible ducts will be completed as part of the energy audit process. Any gaps or holes greater than ¼" must be sealed; and
2. A Combustion Appliance Zone (CAZ) test will be completed as part of the energy audit process and again during the quality control inspection. If, during the worst-case CAZ Test, the air handler causes a pressure difference in the CAZ that is negative two (-2) Pascal's or more (negative) the pressure must be relieved through either return duct sealing or pressure relief venting between the CAZ and the rest of the dwelling.

All duct sealing must be done in accordance with SWS. The method of duct sealing will depend on the location of the leak in the duct system (see **"Methods for Sealing Rigid Metal Ducts"** below).

For modeling duct sealing inside the building envelope in:

- Include duct sealing as part of a furnace replacement measure, or
- Limited duct sealing as health and safety measure when related to depressurization issues.

Ducts outside the building envelope

Site built home

Ducts outside the building envelope will be modeled for duct sealing in WAPLINK using the National Energy Audit Tool (NEAT) as an energy conservation measure. All ducts that have a savings to investment ratio (SIR) of 1.0 or greater (or .75 or greater for jobs for which EAPWX is the only Commerce WAP fund) will be sealed in accordance with SWS. The method of duct sealing will depend on the location of the leak in the duct system (see **"Methods for Sealing Rigid Metal Ducts"** below). Ducts must be sealed prior to insulating to comply with SWS.

In modeling duct sealing and duct insulation for site-built homes in WAPLINK NEAT:

- An HVAC measure to insulate ducts can be created using the [DUCTS] category within the [+ Housing Items] section. Use the [Added insulation] section to enter appropriate information.
- An HVAC measure to seal ducts can be created using the [INFILTRATION] category within the [+ Housing Items] section. The Evaluate Duct Sealing box must be checked in this category and information must first be completed in the previous category [DUCTS].
- Duct sealing and duct insulation can be included as part of a furnace replacement measure.

Additional options for duct sealing only:

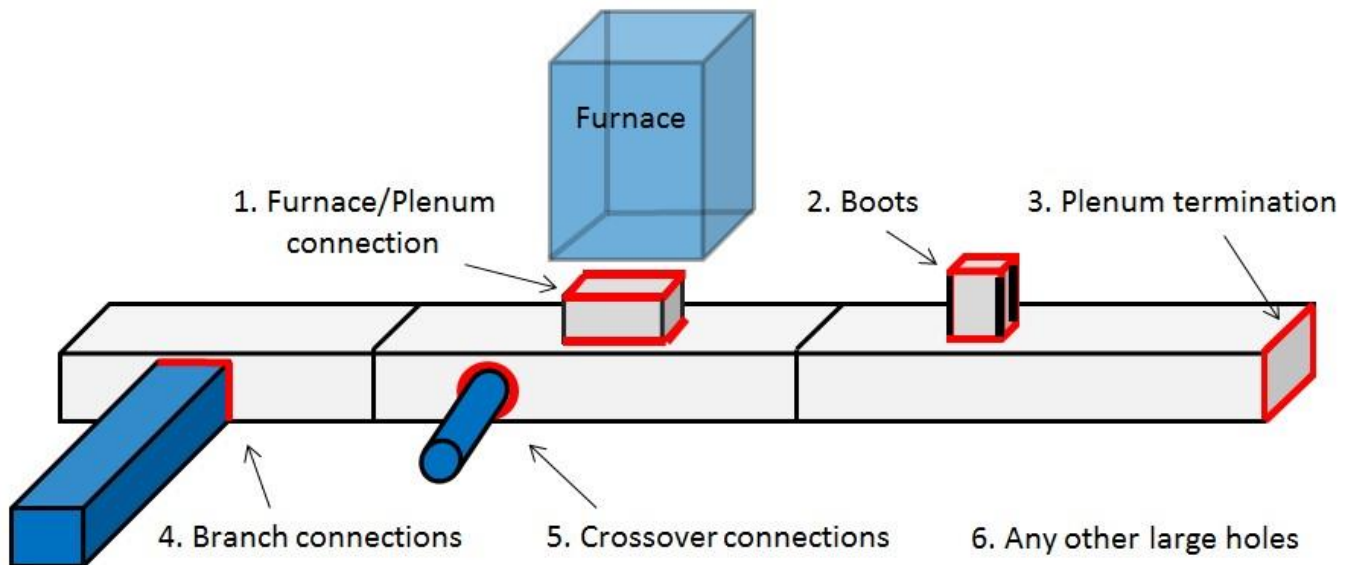
- Limited duct sealing may be modeled as a health and safety measure.

Duct Sealing Guidance

Manufactured home

Ducts in the floor or attic cavities are considered outside the building envelope and will be modeled in WAPLINK using Manufactured Home Energy Audit (MHEA) tool as an energy conservation measure. All ducts that have a SIR of 1.0 or greater (or .75 or greater for jobs for which EAPWX is the only Commerce WAP fund) will be sealed in accordance with SWS. The method of duct sealing will depend on the location of the leak in the duct system (see **“Methods for Sealing Rigid Metal Ducts”** below).

Seal the following areas (shown in red) as SIR allows in the following order:



In modeling duct sealing and duct insulation outside the building envelope in WAPLINK-MHEA:

- Include duct sealing as part of a furnace replacement measure.
- Limited duct sealing may be modeled as a health and safety measure with reference to correcting issues with depressurization and natural drafting appliances.
- Model per guidance below for an Energy Conservation Measure:
 1. In the [Air/Duct Leak] category, select the Evaluate Duct Sealing box and select Pressure Pan Measurements from dropdown.

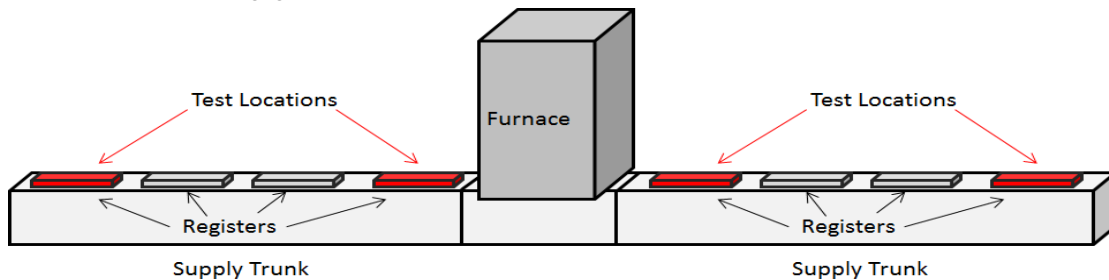
Evaluate Duct Sealing <input checked="" type="checkbox"/>		Duct Leakage Method Pressure Pan Measurements	
Whole House Blower Door Measurements			
	Before Weatherization (Existing)	After Weatherization (Target or Actual)	
Air Leakage Rate (cfm)	3000	1500	
at House Pressure Difference (Pa)	50	50	
Duct Operating Pressures			
	Before Duct Sealing	After Duct Sealing	
Supply (Pa)	35	40	

2. Enter the following data:

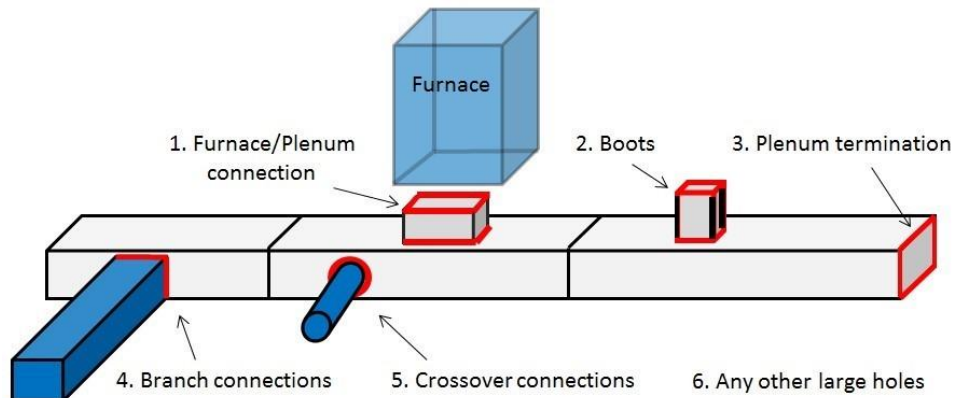
Duct Sealing Guidance

Evaluate Duct Sealing <input checked="" type="checkbox"/> Duct Leakage Method Pressure Pan Measurements	
Whole House Blower Door Measurements	
Before Weatherization (Existing)	After Weatherization (Target or Actual)
Air Leakage Rate (cfm) 3000	1500
at House Pressure Difference (Pa) 50	50
Duct Operating Pressures	
Before Duct Sealing	After Duct Sealing
Supply (Pa) 35 C	40 D
Pressure Pan Measurements	
Before Duct Sealing	After Duct Sealing
Sum of Pressure Pan Measurements (Pa) 20 A.	5 B

- Before Duct Sealing – With the house depressurized to 50 Pa (WRT the outside) measure the pressure difference between each supply register and the house with a pressure pan and manometer. Enter the sum of all the measurements.
- After Duct Sealing – Enter the total number of supply duct registers in the home.
- Before Duct Sealing - With the air handler fan on, use a manometer and long static pressure probe to measure the supply duct pressures (WRT the interior) at the register nearest and farthest from the furnace for each supply trunk. Enter the average of the readings.
- After Duct Sealing – Add 5 Pa to the Before Duct Sealing pressure and enter here.



Seal the following areas (shown in red) as SIR allows in the following order



Duct Sealing Guidance

Methods for Sealing Rigid Metal Ducts (per SWS)

- Gaps <1/4":
 - Gaps up to 10 feet from furnace air handler: All seams, cracks, joints, holes, and penetrations shall be sealed using fiberglass mesh and mastic.
 - Gaps 10 feet or more from furnace air handler: All seams, cracks, joints, holes, and penetrations shall be sealed using mastic.
- Gaps 1/4" - 3/4":
 - All seams, cracks, joints, holes, and penetrations shall be sealed in two steps:
 1. They will be backed using temporary tape (e.g., foil tape) as a support prior to sealing
 2. They will be sealed using fiberglass mesh and mastic.
- Gaps >3/4":
 - All seams, cracks, joints, holes, and penetrations will be repaired using rigid duct material. Fiberglass mesh and mastic will overlap repair joint by at least 1" on all sides. Fiberglass mesh and mastic will be the primary seal.

Additional Considerations:

- New component to new component ducts should be sealed according to SWS. 2012 IRC M1601.4.1 (Minnesota Mechanical and Fuel Gas code 603.9).
- Duct tape unlisted for a given application shall not be permitted as a sealant on any duct.

Filter Rack and Filter Rack Cover

Filter racks and covers should be modified or replaced as needed to ensure that they are airtight; keep the filter firmly in place; do not allow air to flow around the filter; and allow for easy filter replacement.