

## Duct testing Calculator (New Construction)

House address or lot #: LOT 21, The Highlands, Langley WA		
Conditioned Floor Area: 1354		
Duct tester location: n/a		
Pressure tap location: _____		
Ring (if applicable):    Open    1    2    3    Retrotech		
At Rough-in (Total Leakage)		
Test Method & Standard <sup>1</sup>	Test <sup>2</sup> CFM <sub>25</sub>	Calculated Target
Air Handler Present ≤ 6 CFM <sub>25</sub> per 100 sf of CFA	n/a	.06 X _____ CFA ≤ _____ CFM <sub>25</sub>
Air Handler <u>not</u> Present ≤ 4 CFM <sub>25</sub> per 100 sf of CFA	n/a	.04 X _____ CFA ≤ _____ CFM <sub>25</sub>
Post Construction		
Test Method & Standard <sup>1</sup>	Test <sup>2</sup> CFM <sub>25</sub>	Calculated Target
Air Handler Present (Total Leakage) ≤ 8 CFM <sub>25</sub> per 100 sf of CFA	n/a	.08 X _____ CFA ≤ _____ CFM <sub>25</sub>
Air Handler Present (Leakage to Exterior) ≤ 6 CFM <sub>25</sub> per 100 sf of CFA	n/a	.06 X _____ CFA ≤ _____ CFM <sub>25</sub>
1. Test results must comply with one of the Standards options. 2. Test CFM <sub>25</sub> must be equal to or less than the calculated target.		

## Air Leakage testing Calculator (Blower Door Test)

Standard	Tested CFM <sub>50</sub>	Calculated Test Result
0.00030 SLA	400	$\left( \frac{400 \text{ CFM}_{50} \times 0.055}{1354 \text{ CFA} \times 144} \right) = \text{SLA}$ <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <math>\frac{22}{}</math> </div> <div style="text-align: center;">             divided by           </div> <div style="text-align: center;"> <math>\frac{194,976}{}</math> </div> <div style="text-align: center;">             = SLA           </div> </div> <p style="text-align: right; margin-right: 50px;">SLA = 0.00013</p>

ACH50= 1.66    Volume = `14,894CF    Testing Performed on 10/06/2011

### Glossary

**Rough-In:** After installation of the complete air distribution system but before installation of insulation and sheet rock. Allows for access to all duct seams and connections for re-evaluation of seal integrity if standard is not met in initial test.

**Post Construction:** At or near final inspection. The home must be complete enough to pressurize the home to 25 pa.

**Total Leakage:** Aggregation of the entire systems duct leakage in a duct test.

**Leakage to Exterior:** Aggregation of all duct system leaks to the exterior of the CFA in a duct test.

**CFA:** Conditioned floor area

**CFM<sub>25</sub>:** Cubic feet per minute of air leakage at 25 pascals of pressure

**CFM<sub>50</sub>:** Cubic feet per minute of air leakage at 50 pascals of pressure

**Pascal (pa):** Unit of pressure

**SLA:** Specific leakage area



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## Duct Testing Code Language

**503.10.3 Sealing:** All ducts, air handlers, filter boxes, and building cavities used as ducts shall be sealed. Joints and seams shall comply with Section M1601.3 of the International Residential Code or Section 603.9 of the International Mechanical Code. Duct tightness testing shall be conducted to verify that the ducts are sealed. A signed affidavit documenting the test results shall be provided to the jurisdiction having authority by the testing agent. When required by the building official, the test shall be conducted in the presence of department staff. Duct tightness shall be verified by either of the following:

Post-construction test: Leakage to outdoors shall be less than or equal to 6 cfm per 100 square feet of conditioned floor area or a total leakage less than or equal to 8 cfm per 100 square feet of conditioned floor area when tested at a pressure differential of 0.1 inches w.g. (25 Pascals) across the entire system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test.

Rough-in test: Total leakage shall be less than or equal to 6 cfm per 100 square feet of conditioned floor area when tested at a pressure differential of 0.1 inches w.g. (25 Pascals) across the roughed-in system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test. If the air handler is not installed at the time of the test, total leakage shall be less than or equal to 4 cfm per 100 square feet of conditioned floor area.

### EXCEPTIONS:

1. Duct tightness test is not required if the air handler and all ducts are located within conditioned space.
2. Duct tightness test is not required if the furnace is a nondirect vent type combustion appliance installed in an unconditioned space. A maximum of six feet of connected ductwork in the unconditioned space is allowed. All additional supply and return ducts shall be within the conditioned space. Ducts outside the conditioned space shall be sealed with a mastic type duct sealant and insulated on the exterior with R-8 insulation for above grade ducts and R-5

## Air Leakage Testing Code Language

**502.4.5 Building Air Leakage Testing:** Building envelope air leakage control shall be considered acceptable when tested to have an air leakage less than 0.00030 Specific Leakage Area (SLA) when tested with a blower door at a press of 50 Pascals (0.2 inch w.g.). Testing shall occur at any time after rough in and after installation of penetrations of the building envelope, including penetrations for utilities, plumbing, electrical, ventilation, and combustion appliances and sealing thereof. When required by the building official, the test shall be conducted in the presence of department staff. The blower door test results shall be recorded on the certificate required in Section 105.4.

### EXCEPTIONS:

1. Additions less than 750 square feet.
2. Once visual inspection has confirmed the presence of a gasket (see Section 502.4), operable windows and doors manufactured by small business shall be permitted to be sealed off at the frame prior to the test.

Specific Leakage Area (SLA) shall be calculated as follows:

$$\text{SLA} = (\text{CFM50} \times 0.055) / (\text{CFA} \times 144)$$

Where:

CFM50 = Blower door fan flow at 50 Pascal pressure difference

CFA = Conditioned Floor Area of the housing unit

During testing:

Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed.

Dampers shall be closed, but not sealed; including exhaust, intake, makeup air, back draft, and flue dampers;

Interior doors connecting conditioned spaces shall be open; access hatches to conditioned crawl spaces and conditioned attics shall be open; doors connecting to unconditioned spaces shall be closed but not sealed;

Exterior openings for continuous operation ventilation systems and heat recovery ventilators shall be closed and sealed;

Heating and cooling system(s) shall be turned off;

HVAC ducts supply and return registers shall not be sealed.