2015 Washington State Energy Code

REQUIRED CREDITS

Small dwelling unit *Dwelling less than 1500 sq ft and less than 300 sq ft glazing *Additions between 500 and 1500 sq ft.	1.5 Credits
Medium dwelling unit- *All dwelling units not categorized as small or large	3.5 Credits
Large dwelling unit- *Dwelling greater than 5,000sq ft.	4.5 Credits
Additions less than 500 sq ft	0.5 Credits

Credits (select all that apply)

1a Efficient Building Envelope — 0.5 Credits ○
U.28 glazing; R38 floor; R10 entire slab OR component analysis w/ 5% UA reduction

1b Efficient Building Envelope — 1.0 Credits ○
U.25 glazing; R21 plus R4 walls; R38 floor; Basement walls R21 plus R5 ci; R10 entire slab OR component analysis w/15% UA reduction

1c Efficient Building Envelope — 2.0 Credits ○
U.22 glazing; all roof and rafter R49 advanced. All walls R21 plus R12 ci; R38 floor; R10 slab or component analysis w/ 30% UA reduction

1d Efficient Building Envelope — .5 Credits ○
U.24 glazing

2a Air leakage control and ventilation — .5 Credits ○
Code compliance; reduce to 3 ACH; whole house ventilation

2b Air leakage control and ventilation — 1.0 Credits ○
Code compliance; reduce to m1.5 ACH; HRV .7 whole house ventilation

2c Air leakage control and ventilation — 1.5 Credits ○
Code compliance; reduce to 1.5 ACH; HRV .85 whole house ventilation

3a High efficient HVAC — 1.0 Credits ○
Minimum 94% AFUE Fuel-fired furnace **OR**
Minimum 92% AFUE Fuel-fired boiler

3b High efficient HVAC — 1.0 Credits ○
Air source heat pump minimum SHPF 9.0

3c High efficient HVAC — 1.5 Credits ○
Ground source heat pump COP 3.3 **OR** Water source heat pump 3.6

3d Ductless system – mini split — 1.0 Credits ○

4 High efficient HVAC distribution — 1.0 Credits ○
All inside conditioned space; all combustion eq. direct vent or seal combustion

5a efficient water heating — .5 Credits ○
All showerheads and kitchen sink faucets 1.75 gpm or less;
All other lavatory faucets 1.0 gpm or less

5b Efficient water heating — 1.0 Credits ○
Fuel fired water heater w/ min. EF .74 **OR** water heater heated by ground source heat pump per **3c**

5c Efficient water heating — 1.5 Credits ○
Fuel fired water heater w/ min EF .91 **OR** Solar water heating **OR** Electric Heat pump w/ EF 2.0

5d Efficient Water Heating — .5 Credits ○
Drain water heat recover unit

6 Renewable Electric Energy — .5 Credits ○

2015 PRESCRIPTIVE REQUIREMENTS AJUSTED FOR SELECTED CREDITS

Walls	Floors	Ceilings	Basement Walls	Slabs	Glazing

HVAC SUMMARY

All HVAC shall be sized in accordance w/ ACCA Manual S&J

Model Number	CFM	BTUs	Efficiency Rating	HRV yes/no	OSA	OSA Duct Size

HVAC DUCT SIZING

Ducts shall be sized in accordance with ACCA Manual D too achieve required CFM

Trunk Size	Bedrooms	Bathroom	Living Room	Utility	Other

EXHAUST AND WHOLE HOUSE VENTILATION

Location	CFM	Duct Size	Timer	Whole House Ventilation Type
Kitchen				
Master bath				
Bathroom				
Utility				

VAPOR RETARDER PRODUCT INFORMATION - to be completed if using Vapor Retarder Primer

Contractor name	
Contractor phone	
Product name	
Product description	
Perm rating	
Required mil thickness:	Dry mil: Wet mil:
Contractor Signature:	Date:

R702.7 Vapor retarders
Class I or II vapor retarders are required on the interior side of above grade walls. The vapor retarder class shall be based on the manufacture's certified testing or a tested assembly.
The following shall be deemed to meet the class specified:
Class I: Sheet polyethylene, unperforated aluminum foil
Class II: Kraft-faced fiberglass batts or vapor retarder primer

TABLE 403.8.4.2 PRESCRIPTIVE EXHAUST DUCT SIZING

Tested Fan CFM	Min Flex Diameter	Max Length in Feet	Min Smooth Diameter	Max Length in Feet	Max Elbow1
50	4 inches	25	4 inches	70	3
50	5 inches	90	5 inches	100	3
50	6 inches	No Limit	6 inches	No Limit	3
80	4 inches[2]	NA	4 inches	20	3
80	5 inches	15	5 inches	100	3
80	6 inches	90	6 inches	No Limit	3
100	5 inches[2]	NA	5 inches	50	3
100	6 inches	45	6 inches	No Limit	3
125	6 inches	15	6 inches	No Limit	3
125	7 inches	70	7 inches	No Limit	3

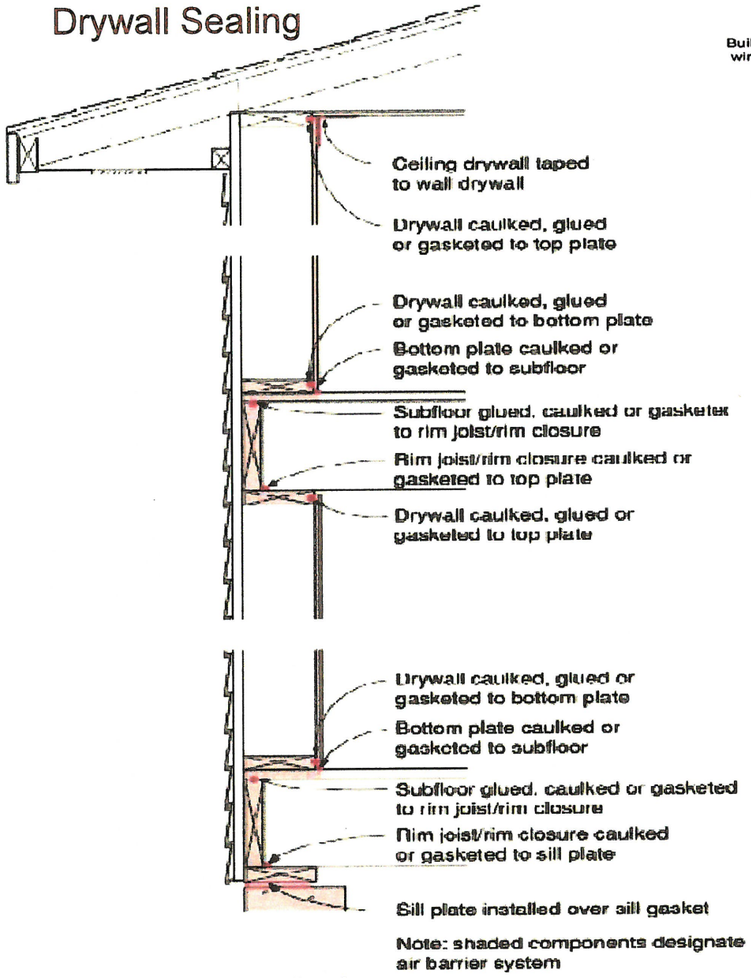
1. For each additional elbow, subtract 10 feet from length
2. Flex ducts of this diameter are not permitted with fans of this size.

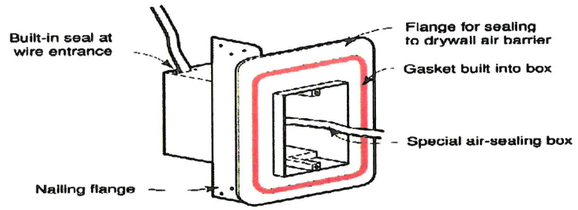
TABLE M1507.3.3(1)
CONTINUOUS WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM AIRFLOW RATE REQUIREMENTS

DWELLING UNIT FLOOR AREA (Square feet)	NUMBER OF BEDROOMS				
	0 - 1	2 – 3	4 – 5	6 – 7	>7
	Airflow in CFM				
< 1,500	30	45	60	75	90
1,501 – 3,000	45	60	75	90	105
3,001 – 4,500	60	75	90	105	120
4,501 – 6,000	75	90	105	120	135
6,001 – 7,500	90	105	120	135	150
>7,500	105	120	135	150	165

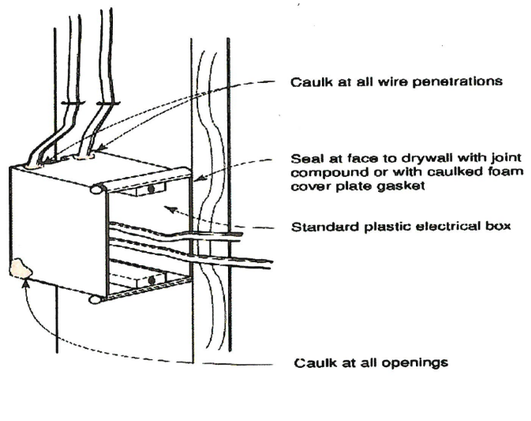
For additional information and forms go to:
http://www.energy.wsu.edu/BuildingEfficiency/EnergyCode.aspx

Drywall Sealing

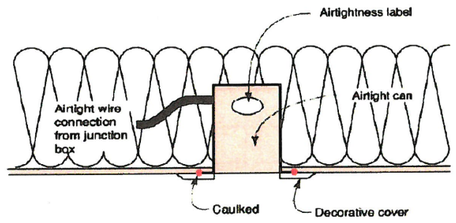




Electrical Box Penetration



Recessed Fixture in Insulated Ceiling



- Fixture labeled IC-rated and airtight as determined by ASTM E-283 air leakage test
- Housing (not decorative trim piece) sealed to ceiling with caulk or gasket

(WAC) M1507.3 WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM

Whole-house mechanical ventilation systems shall be designed in accordance with Sections M1507.3.1 through M1507.3.3.

M1507.3.2 Control and operation. OR

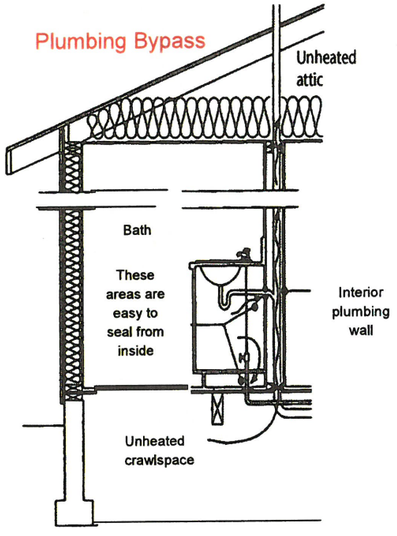
M1507.3.4 Whole-house ventilation using exhaust fans. OR

M1507.3.5 Whole-house ventilation integrated with a forced-air system. OR

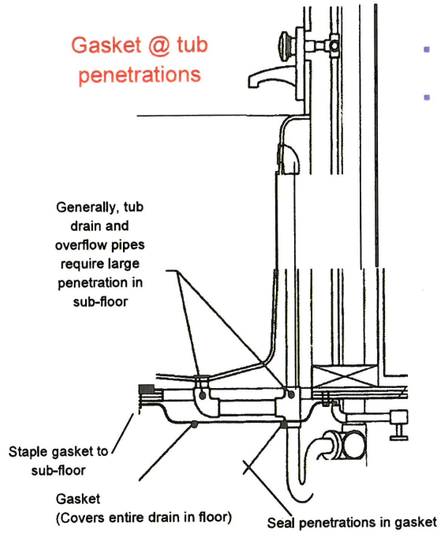
M1507.3.6 Whole-house ventilation using a supply fan. OR

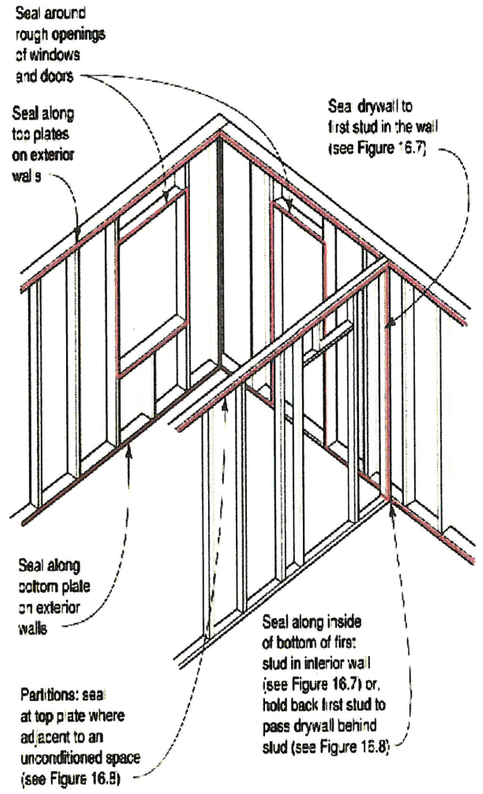
M1507.3.7 Whole-house ventilation using a heat recovery ventilation system.

Plumbing Bypass

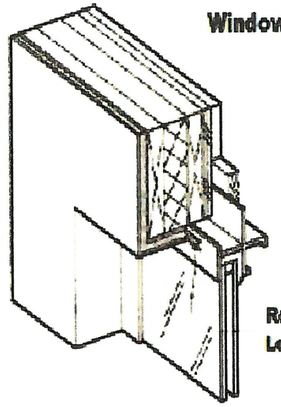


Gasket @ tub penetrations





Window Sealing



Recommended Location for Sealant

Post WSEC Compliance Form

Total Duct Leakage Test

Testing Procedure Application:
This test is appropriate in new construction when ducts are to be tested at the rough-in stage before the house envelope is intact and can also be done post construction. The test measures the total collected leaks in the system at an induced pressure of 25 Pascals (PA). Compared to the leakage to exterior test, the total leakage test is simpler, but does not discriminate between leakage to inside and outside the heated space; as such, this test is not recommended for homes with complete house envelopes and HVAC systems. In such cases, the leakage to outside test is recommended.

Standard:

1. For certification, the measured duct leakage must not exceed 0.04 CFM_{25} x floor area (in square feet) served by the system at rough-in **when the air handler is installed.**
2. The measured duct leakage at rough-in must not exceed 0.03 CFM_{25} x floor area (in square feet) served by the system **when the air handler is <u>not</u> installed.**
3. **If testing post construction, the total leakage must not exceed** 0.04 CFM_{25} x floor area (in square feet) served by the system

Energy Code Support — Washington State University Extension Energy Program

Duct Testing Standard (RS-33)
For New and Existing Construction

<u>New Construction</u>

Based on the protocol for "Total Leakage Testing," or "Leakage Testing to Outdoors" duct leakage in new construction shall not exceed 0.04 CFM_{25} x floor area (in square feet) served by the system for leakage to outdoors or for total leakage when tested post construction. When testing at rough-in, targets should not exceed 0.04 CFM_{25} x floor area (in square feet) for total leakage or 0.03 CFM_{25} x floor area (in square feet) if the air handler is not installed.

Exception: The total leakage test is not required for ducts and air handlers located entirely within the building thermal envelope. Ducts located in crawl spaces do not qualify for this exception.

<u>Existing Construction</u>

When a space-conditioning system is altered by the installation or replacement of space-conditioning equipment (including replacement of the air handler, outdoor condensing unit of a split system air conditioner or heat pump, cooling or heating coil, or the furnace heat exchanger), the duct system that is connected to the new or replacement space-conditioning equipment shall be tested. The test results shall be provided to the building official and the homeowner.

Exception 1: Duct systems that are documented to have been previously sealed as confirmed through field verification and diagnostic testing in accordance with procedures in RS-33.

Exception 2: Ducts with less than 40 linear feet in unconditioned spaces.

Exception 3: Existing duct systems constructed, insulated or sealed with asbestos.

Exception 4: Additions of less than 750 square feet of conditioned floor area.

In addition, the following requirements must be met:

1. All testing must be done by a qualified technician. The minimum qualification requirement is documented attendance at a duct testing training course approved by the building official. The following existing training programs are recognized as equivalent to this requirement:
   a. Northwest ENERGY STAR Homes Program, Performance Testing training for new construction.
   b. Performance Tested Comfort Systems (PTCS) training for existing homes and new construction.
2. Duct systems must be designed, sized, and installed using recognized industry standards and International Residential Code (IRC) requirements, so that calculated heating and/or cooling loads are delivered to each zone.