2015 Washington State Energy Code ~ Residential

REQUIRED CREDITS

Small dwelling unit — **1.5 Credits**
*Dwelling less than 1500 sq ft and less than 300 sq ft glazing
*Additions between 500 and 1500 sq ft.

Medium dwelling unit- — **3.5 Credits**
*All dwelling units not categorized as small or large

Large dwelling unit- — **4.5 Credits**
*Dwelling greater than 5,000sq ft.

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 entire 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 2 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 HSPF 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** ☐
.5 credit per 1200 kWh up to 3 credits

PRESCRIPTIVE ENERGY CODE COMPLIANCE CLIMATE ZONE MARINE 4

Component	Fenestration		Ceiling w/Attic	Wood Framed Wall	Mass Wall (above grade)	Below Grade Wall	Framed Floor	Slab R-Value & Depth
	Vertical	Overhead						
Prescriptive Value	U. .30 Max	U .50 Max	R-49 Min.	R-21 Min	R-21 Min	R10 /15/21 Int + TB	R-30 Min	R-10 Min 2”
Adjusted for Selected Credits								

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	Return

SOURCE SPECIFIC EXHAUST VENTILATION & FAN EFFICIENCY- Required in each kitchen, bathroom, water closet compartment, laundry room, indoor swimming pool, spa and other rooms where water vapor or cooking odor is produced (IRC M1507.4) Fan efficiency from WAC 51-11R Table R403.5.1

MINIMUM SOURCE SPECIFIC EXHAUST VENTILATION CAPACITY REQUIREMENTS

	Bathrooms – Utility Rooms		Kitchens	Whole House Exhaust
Intermittently operating	50 cfm		100 cfm	
Continuous Operation	20 cfm		25 cfm	
Air Flow Rate Min (cfm)	10	90	Any	Any
Min Efficacy (cfm/watt)	1.4 cfm/watt	2.8 cfm/watt	2.8 cfm/watt	2.8 cfm/watt
Air Flow Rate Max (cfm)	>90	Any	Any	Any

VAPOR RETARDER PRODUCT INFO. *Complete if using Vapor Retarder Primer*

Contractor name		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 ~ 0.1 perm or less

☐ **Class II:** Kraft-faced fiberglass batts or vapor retarder primer ~ 0.1 < per ≤ 1.0

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 Elbow[1]
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.

WHOLE HOUSE VENTILATION (PRESCRIPTIVE) (WHV)

Please check the appropriate box to describe which of the four prescriptive Whole House Ventilation Systems you will be using.

☐ 1. Intermittent WHV Using Exhaust Fans & Fresh Air Inlets (IRC M1507.3.4)
☐ 2. Intermittent WHV Using Integrated w/ a Forced Air System (IRC M1507.3.5)
☐ 3. Intermittent WHV Using a Supply Fan (IRC M15017.3.6)
☐ 4. Intermittent WHV Using a Heat Recovery Ventilation System (IRC M1507.3.7)
☐ 5. Continuous HV System Airflow Rate

Table M1507.3.3(1)

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

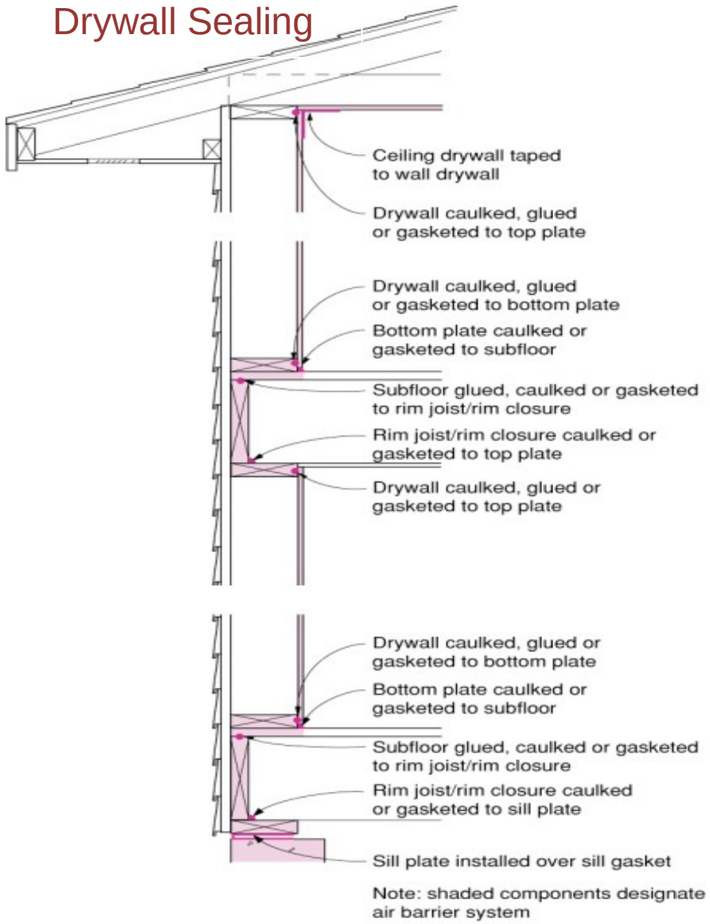
Table M1507.3.3(2)
Intermittent Whole House Mechanical Ventilation Rate Factors

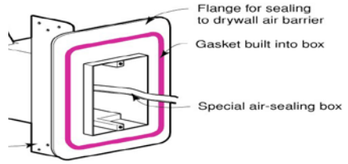
Run time % in Each 4- Hour Segment	25%	33%	50%	66%	75%	100%
Factor[a]	4	3	2	1.5	1.3	1.0

a. For ventilation system run time values between those given, the factors are permitted to be determined by interpolation.

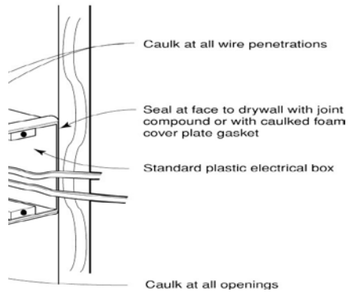
For additional information and forms go to:
http://www.energy.wsu.edu/BuildingEfficiency/EnergyCode.aspx

Drywall Sealing

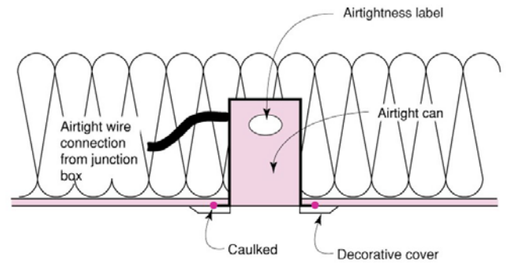




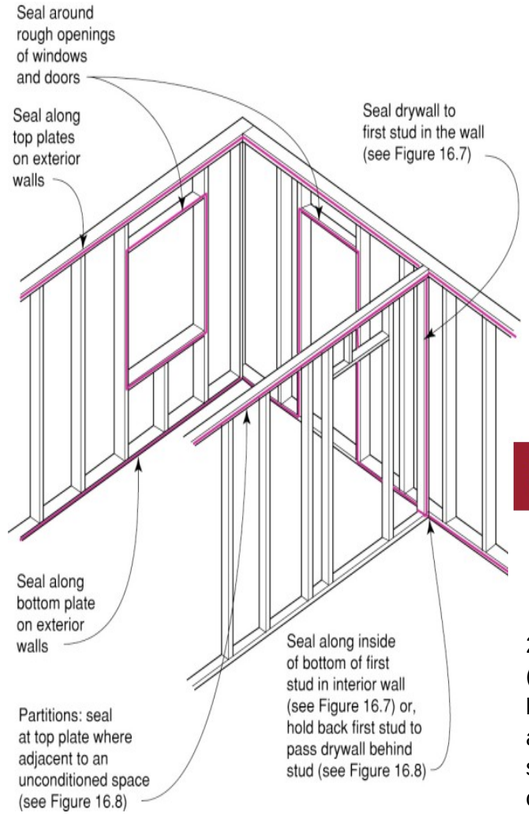
Electrical Box Penetration



Recessed Fixture in Insulated Ceiling

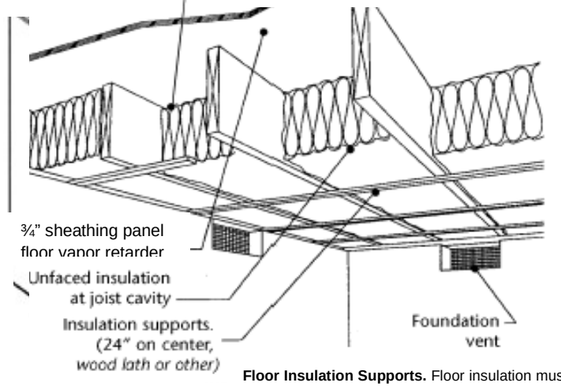


- Fixture labeled IC-rated and airtight as determined by ASTM E-283 air leakage test
- Housing (not decorative trim piece) sealed to ceiling with caulk or gasket



Insulation must be in contact with the floor

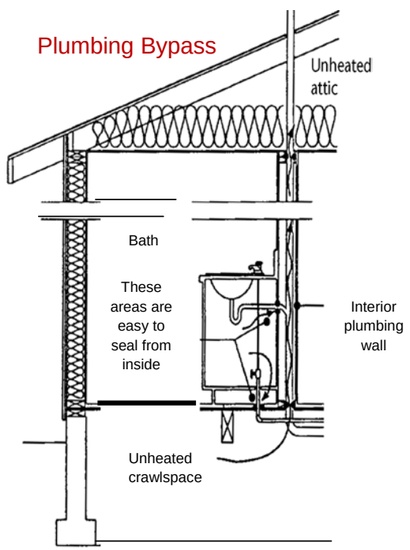
Floor Insulation Supports



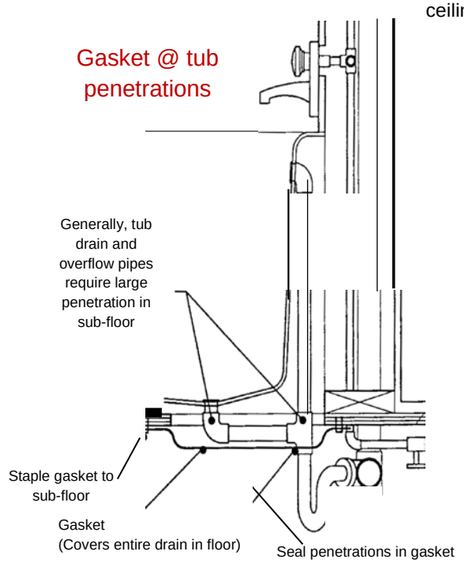
Floor Insulation Supports. Floor insulation must be installed in a permanent manner and in substantial contact with the surface being insulated. Insulation can be held in place using:

- Polyethylene twine
- Lath
- Other approved material

Plumbing Bypass



Gasket @ tub penetrations



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

Blower Door
Building Air Leakage Testing

2015 Washington State Energy Code (WSEC) section R402.4.1.2 requires air leakage testing for all new houses and additions. The requirement is met if the structure has a leakage rate of 5 air changes per hour when depressurized with a blower door to 50 Pascals or less ($5ACH_{50}$). Pascal is a measurement of pressure. 249 Pascals are equal to 1" of water column.

The test must be performed using a Blower Door device which consists of a large fan, a frame and panel. A manometer (pressure gauge) is used to read house and fan pressures.

WSEC states that the test may be performed at any time after rough in. All penetrations in the building envelope must be sealed including those for utilities, plumbing, electrical, ventilation and combustion appliances. The code also states that when required by the building official, the test shall be conducted by an approved third party

$$ACH_{50} = (CFM_{50} \times 50) / Volume$$

Required residential building air leakage test results
http://www.energy.wsu.edu/Documents/Blower%20door%20results%20form_2015.pdf
Required duct testing affidavit (New Construction)
http://www.energy.wsu.edu/Documents/Duct%20Leakage%20affidavit%20new%20construction%201_29_12