



# 2016 Residential ACM Reference Manual

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- Overview
- PV System Credit
- Envelope
- Mechanical
- Water Heating



# OVERVIEW

## ENERGY USE SUMMARY

04	05	06	07
Energy Use (kTDV/ft <sup>2</sup> -yr)	Standard Design	Proposed Design	Compliance Margin
Space Heating	6.98	7.73	-0.75
Space Cooling	4.47	6.21	-1.74
IAQ Ventilation	0.00	0.00	0.00
Water Heating	13.93	9.39	4.54
Photovoltaic Offset	---	0.00	0.00
Compliance Energy Total	25.38	23.33	2.05



# PV CREDIT

- Calculation method included in Section 2.2.3
- Requires at least 2 kWdc system
- Floor area and climate zone are factors



# **ENVELOPE**

## **PACKAGE A**

### **HIGH PERFORMANCE ATTIC**

# High Performance Attic

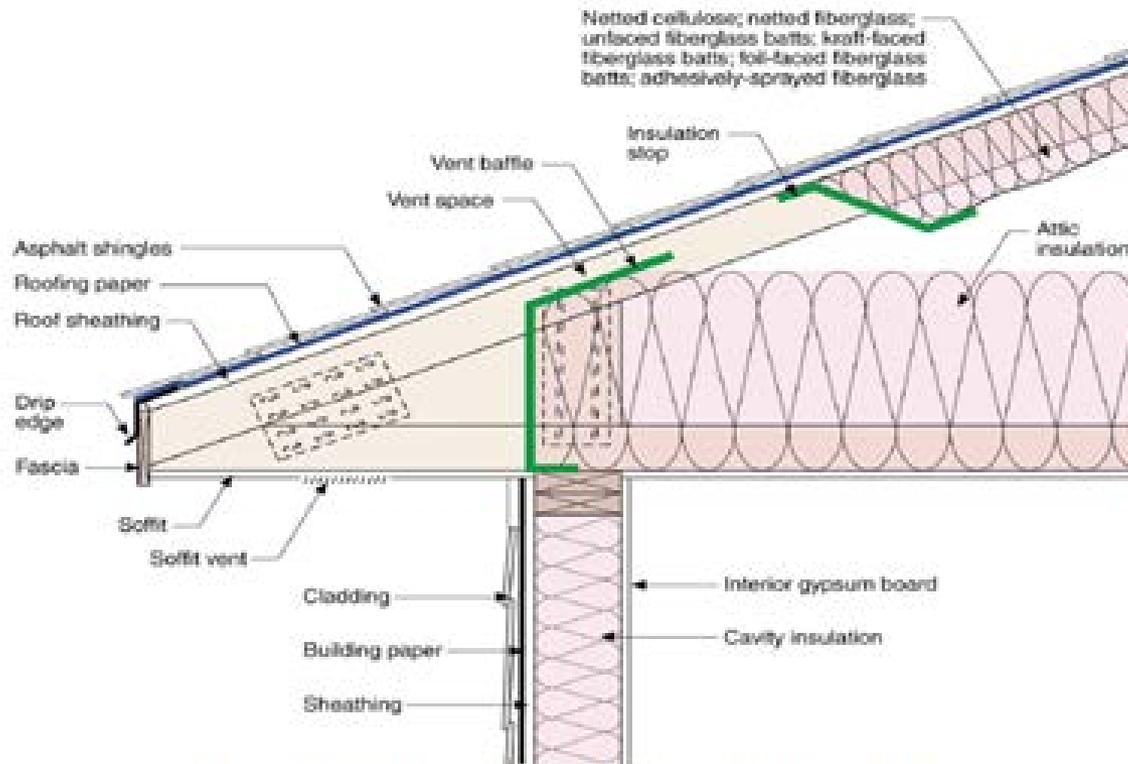


Figure 1: Venting Details for Modified Conventional Vented Attic



## Prescriptive Attic

- Option A: Above deck continuous insulation + ceiling insulation [Ducts in attic]; or
- Option B: Below deck insulation + ceiling insulation [Ducts in attic]; or
- Option C: Ceiling insulation / typical [Ducts in conditioned space]



# High Performance Attic – Option B

## Ceiling Insulation:

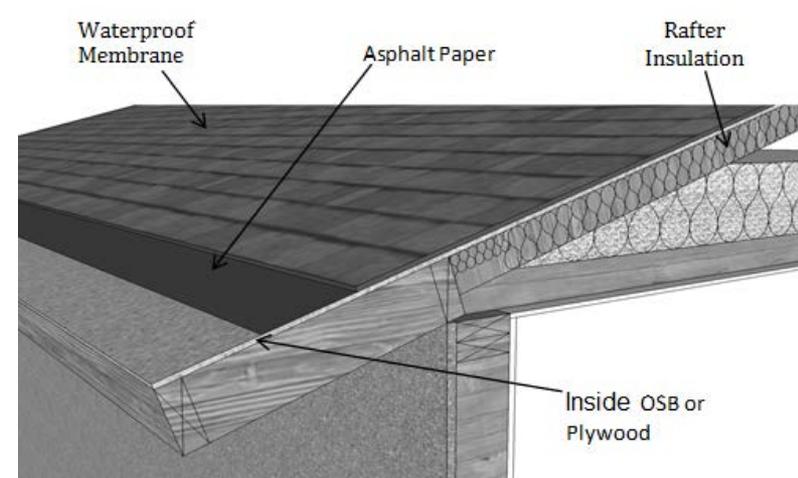
- Climate zones 1, 2, 4, and 8-16 have R-38
- Climate zones 3 and 5-7 have R-30



# High Performance Attic

## Below Deck Insulation:

- Climate zones 1-3 and 5-7 have R-0
- Climate zones 4 and 8-16 have R-13
- In contact with the roof deck





# High Performance Attic

## Radiant Barrier:

- Climate zones 2, 3, 5-7 = Yes
- Climate zones 1, 4, and 8-16 = No



# High Performance Walls

## Framed Walls:

- Wood framed walls
- CZ 1-5, 8-16 have 2x6 R-19 + R-5
- CZ 6-7 have 2x4 R15 + R-5



## Above Grade Mass Walls:

- Interior and Exterior insulation
- CZ 1-15 Interior R-13 and Exterior R-8
- CZ 16 Interior R-17 and Exterior R-13





## Floors

- Framed floors R-19 in 2x6 wood framing
- Slab edge insulation CZ 16 = R-7
- Raised concrete:
  - CZ 1, 2, 11, 13, 14, 16 = R-8 continuous
  - CZ 12 and 15 = R-4 continuous
  - CZ 2-10 = R-0 continuous



# MECHANICAL

## Fault Indicator Display

- Formerly Charge Indicator Display (CID)



# Duct Leakage

- Changes from 6% to 5%



# Duct Assumptions

R-values based on Attic Option B / located in attic:

- CZ 3, 5-7 = R-6
- CZ 1-2, 4, 8-16 = R-8



# Whole House Fan / Ventilation Cooling

- Total airflow 1.5 CFM/ft<sup>2</sup> (previously 2) of conditioned floor area
- At least 1 square foot of attic vent free area for each 750 CFM (previously 375) of rated capacity

No change in climate zones:

- CZ 8-14 – Yes WHF in standard design
- CZ 1-7, 15-16 - No WHF in standard design



## Zonal Control vs. Zoned Cooling

- Add language specifying that 150 cfm/ton is assumed for single speed zoned cooling systems (exception to mandatory requirement) as a default (a penalty)
- Add language that modeling between 150 and 350 cfm/ton is allowed only for single speed



# WATER HEATING

Systems serving individual dwelling units:

- Standard design is 0.82 instantaneous water heater

Central water heating:

- No change