

Secrets to a Comfortable Home

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Town Of West Hartford

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Secrets of a Comfortable Home



Secrets of a Comfortable Home

It's not really a secret!

- Warm
- Dry
- Full stomach



Secrets of a Comfortable Home

- Temperature – How do we keep homes at a comfortable temperature?
 - Big furnace or
 - Well insulated air tight structure
 - How tight is too tight?
- Humidity and Air Quality
 - Sources of household humidity
 - Mold, health problems
 - Indoor pollutants
- Full stomach – Not covered here



But How Do We Get There?

MARVEL
570.com

"WHAT IS THE TRUE COST OF A MAN'S MISTAKES?"

FANTASTIC FOUR



HICKMAN
EAGLESHAM
MOUNTS

RATED A



WWW.MARVEL.COM

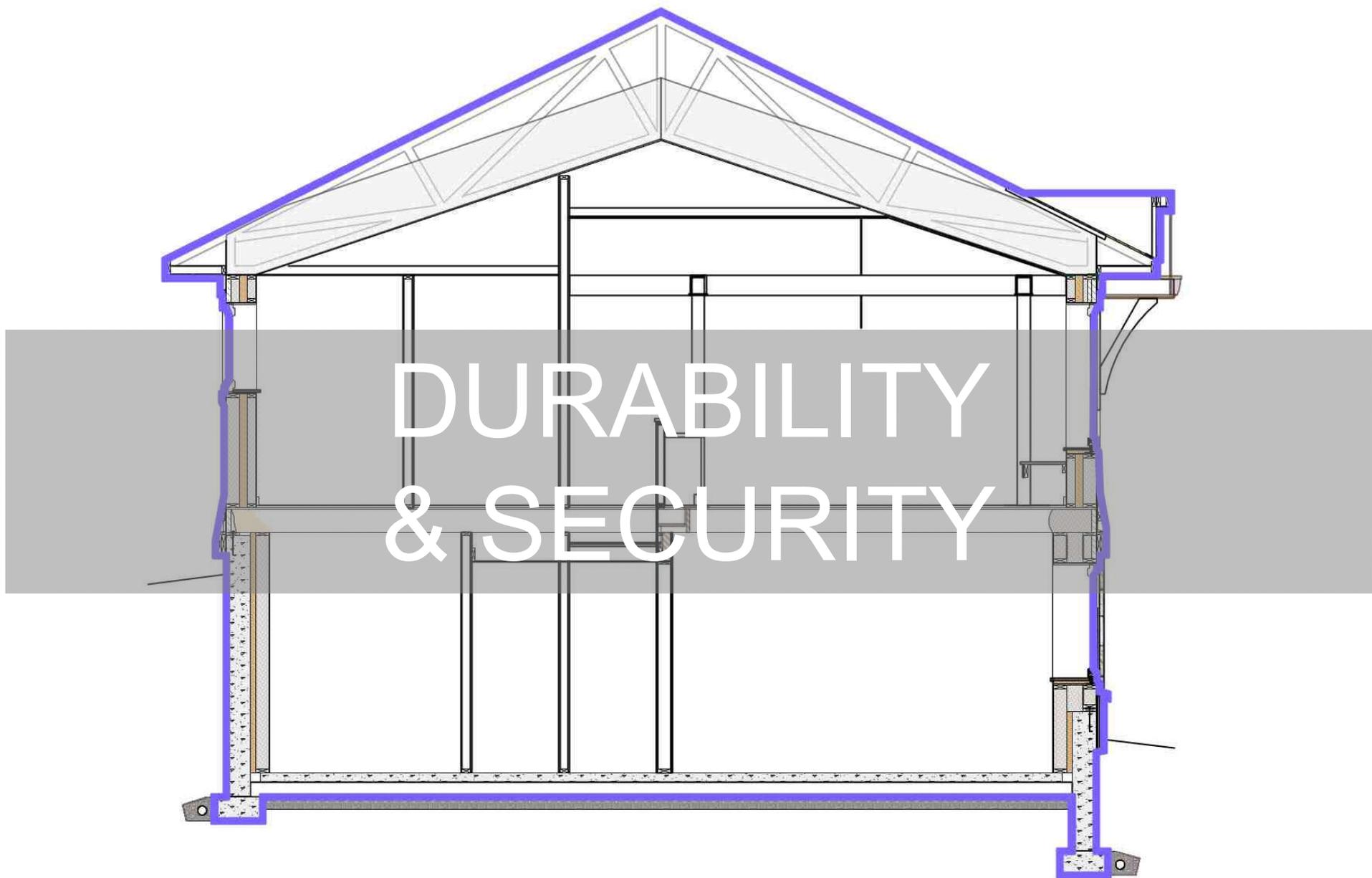
DIRECT EDITION

\$2.99 US



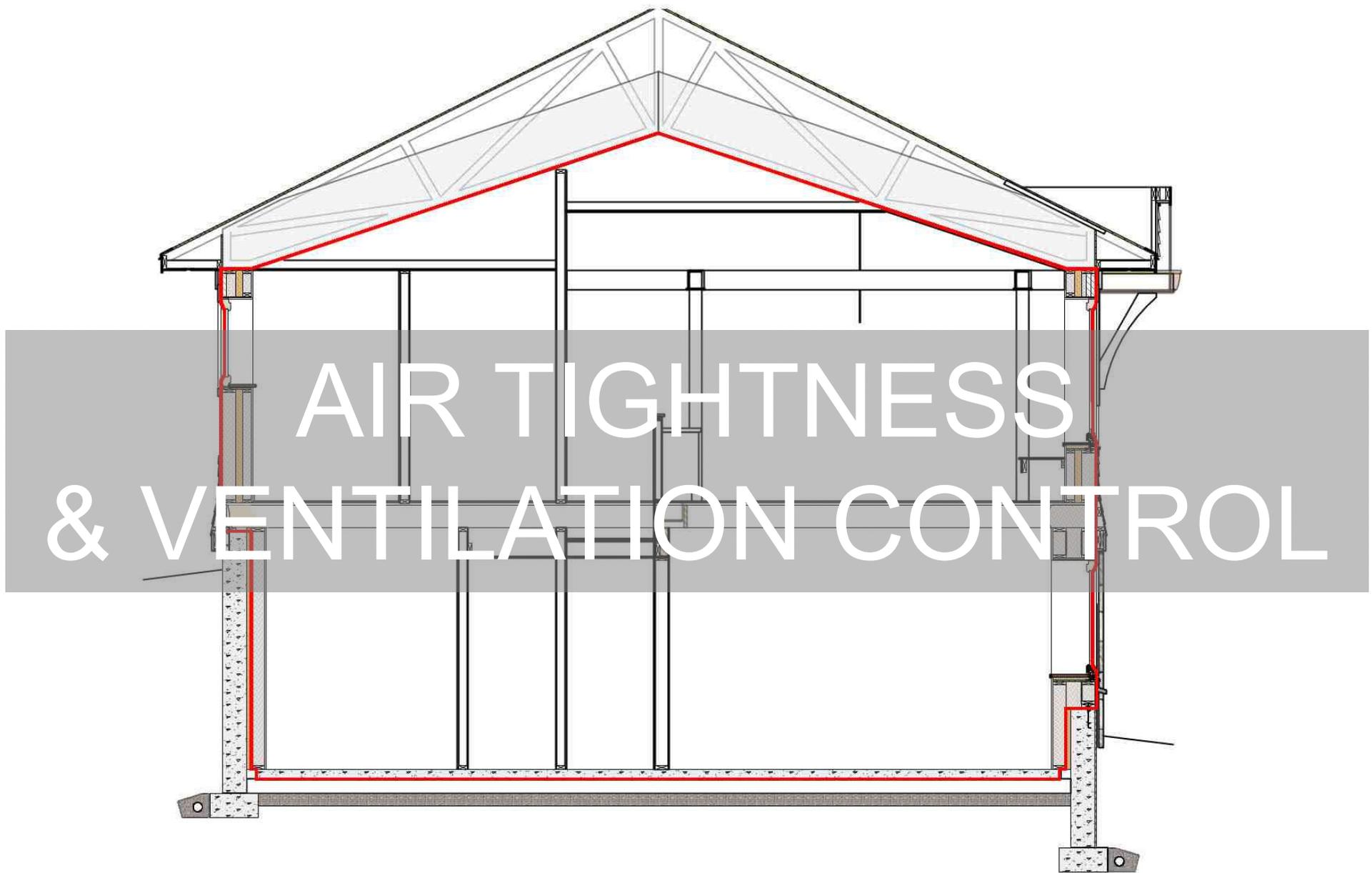
THE SUPERHEROES
WEATHER
AIR
THERMAL
VAPOR
BARRIERS

HIGH PERFORMACE ENCLOSURE



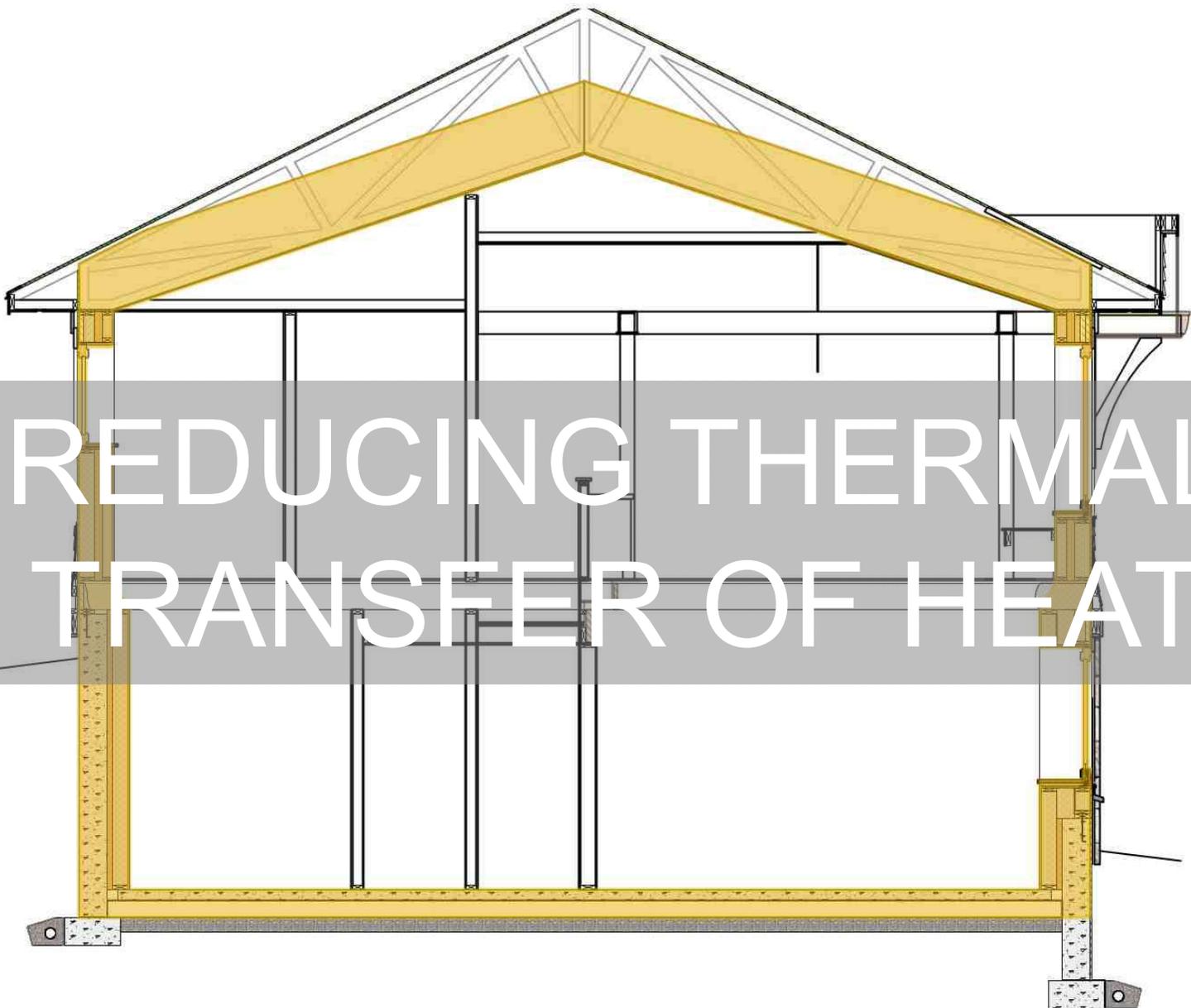
DURABILITY
& SECURITY

THE WEATHER BARRIER



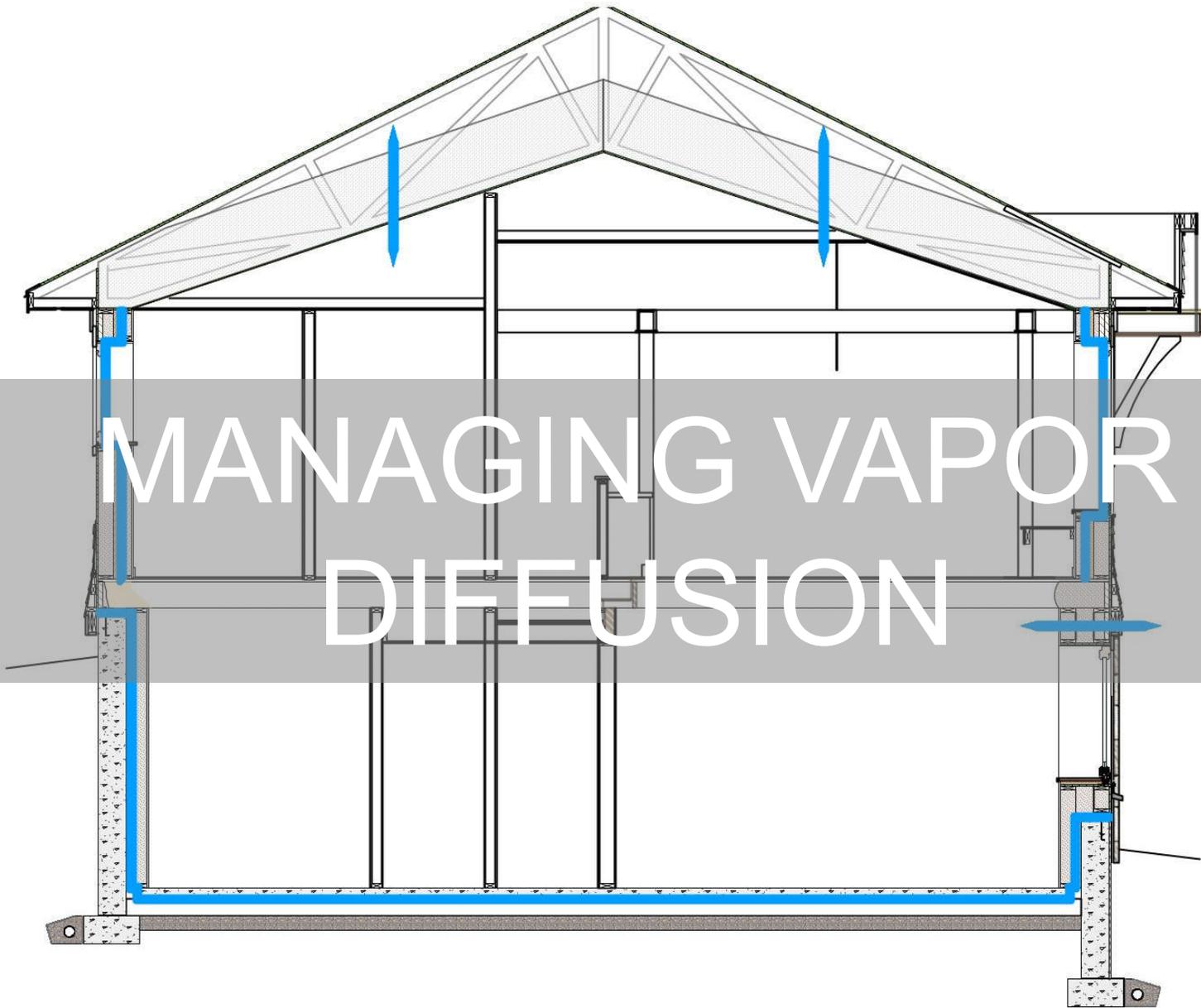
AIR TIGHTNESS & VENTILATION CONTROL

THE AIR BARRIER



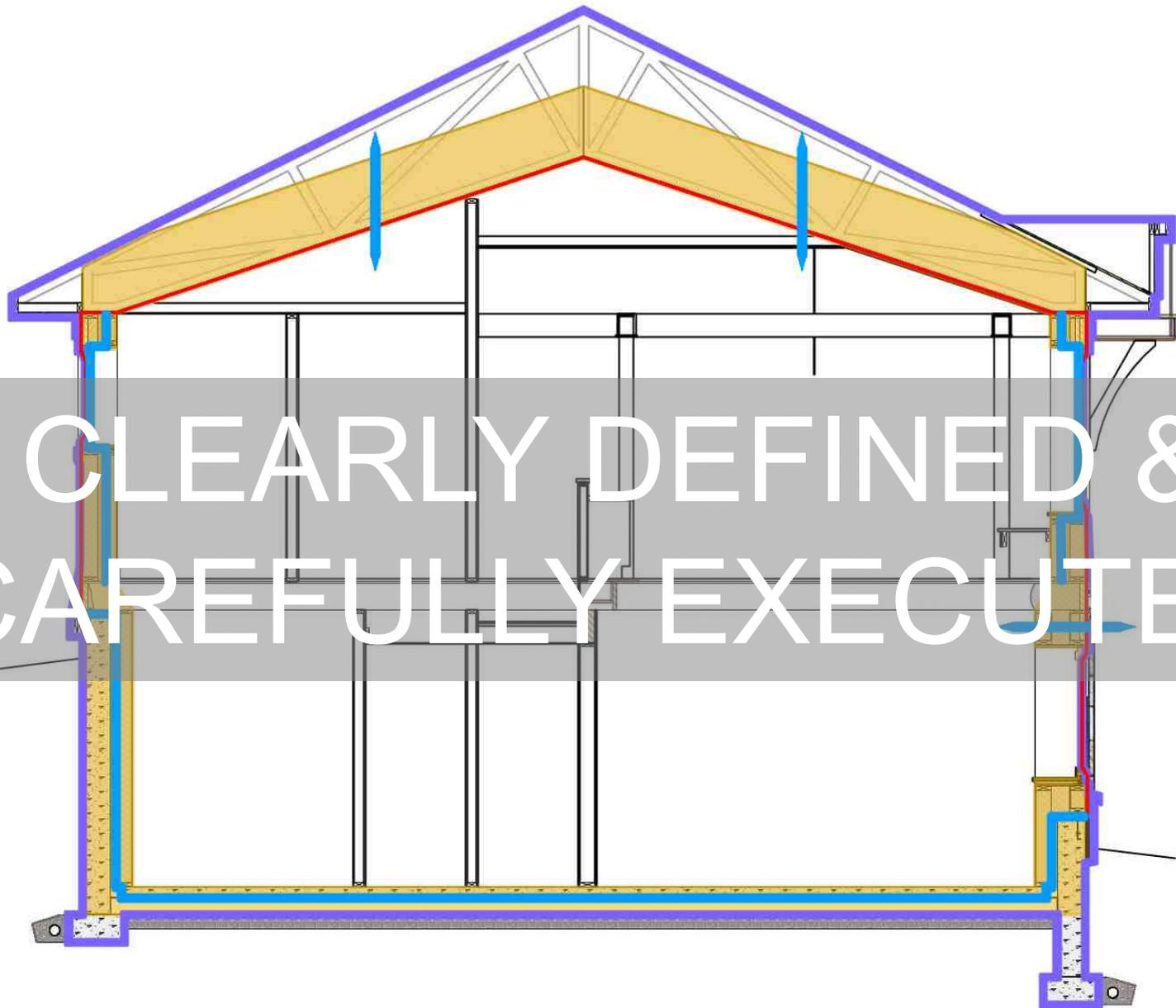
REDUCING THERMAL
TRANSFER OF HEAT

THE THERMAL BARRIER



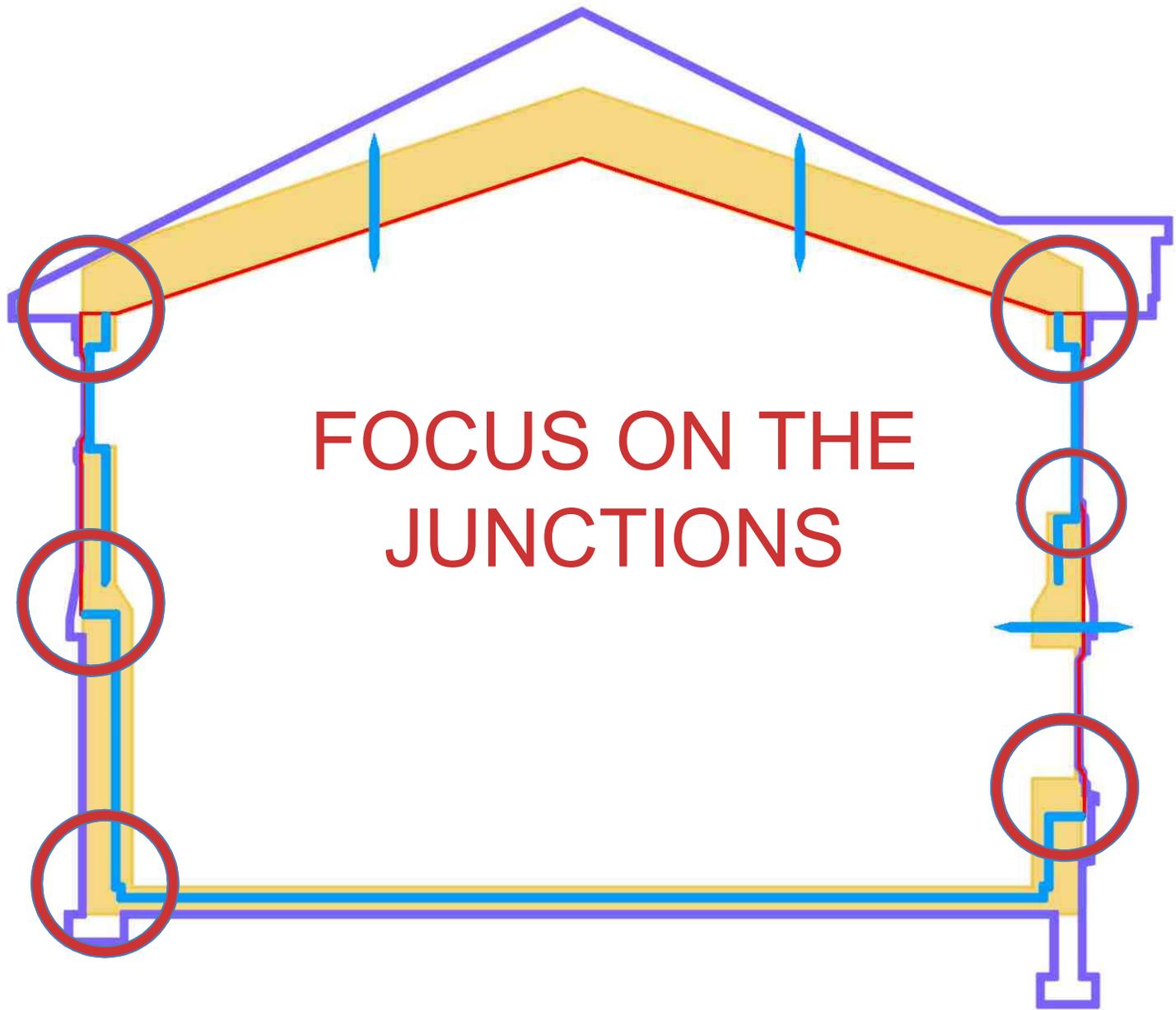
MANAGING VAPOR DIFFUSION

THE VAPOR BARRIER



CLEARLY DEFINED &
CAREFULLY EXECUTED

THE FOUR BARRIERS



FOCUS ON THE
JUNCTIONS

HIGH PERFORMACE ENCLOSURE

It is Hard in Existing Buildings

Especially after additions or major renovations



FINDING PROBLEM AREAS IN EXISTING HOUSES







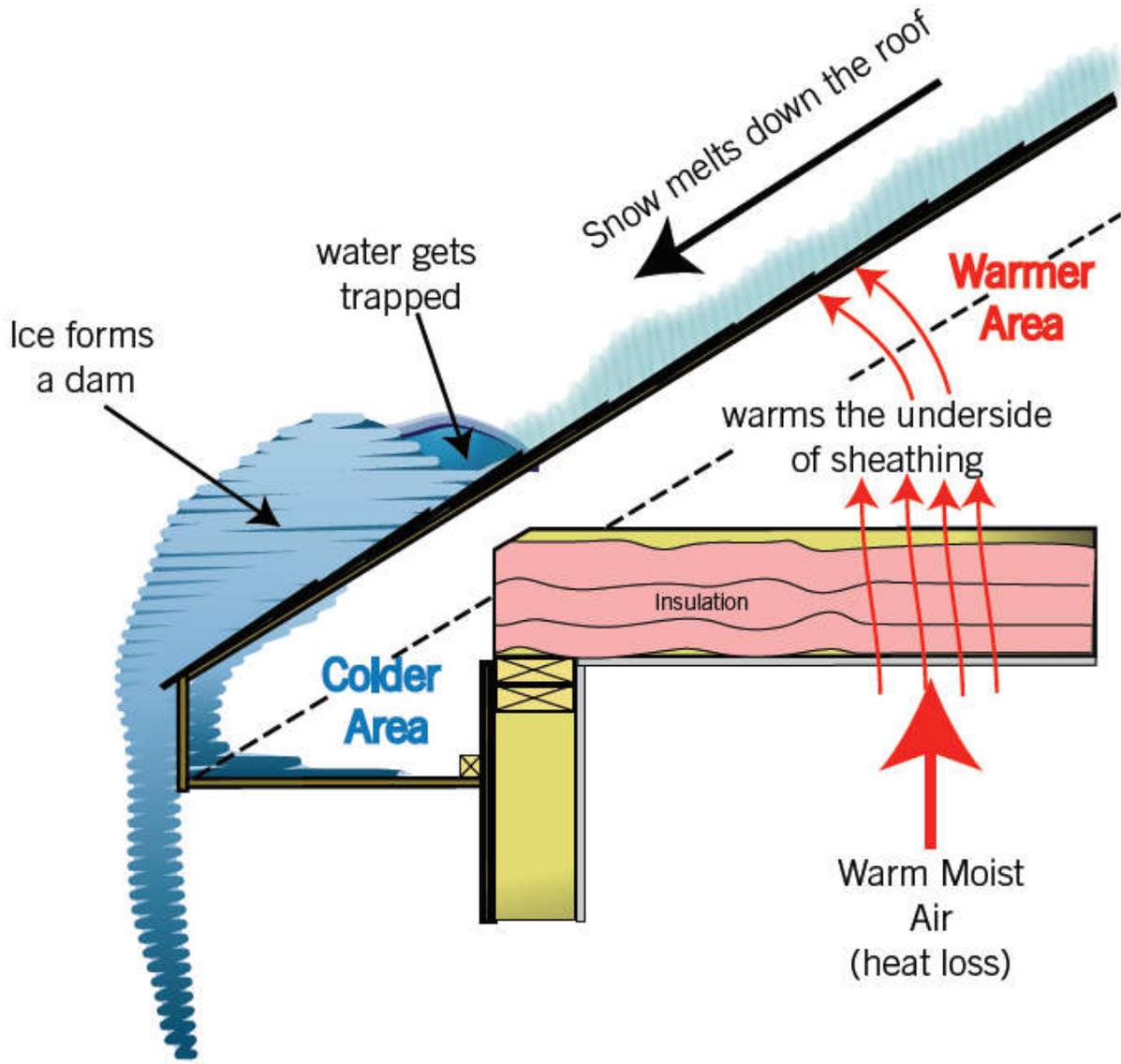
New Construction



Renovation



ICE DAMS



The Tale of Two Neighbors

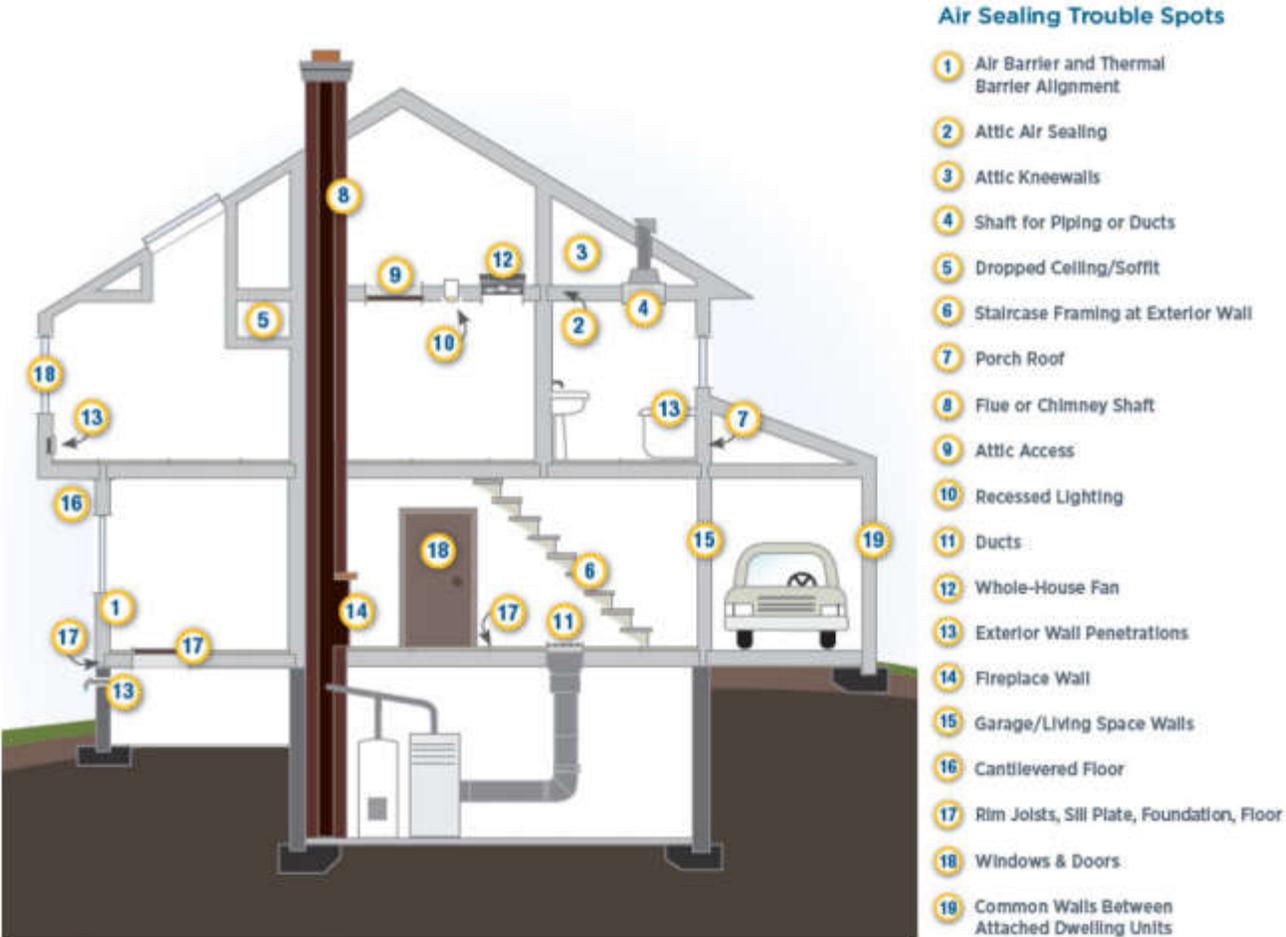


The Tale of Two Neighbors

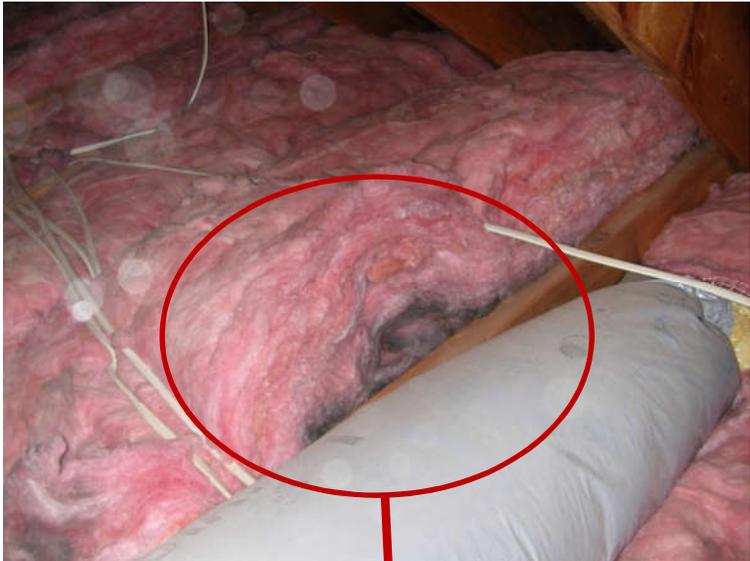
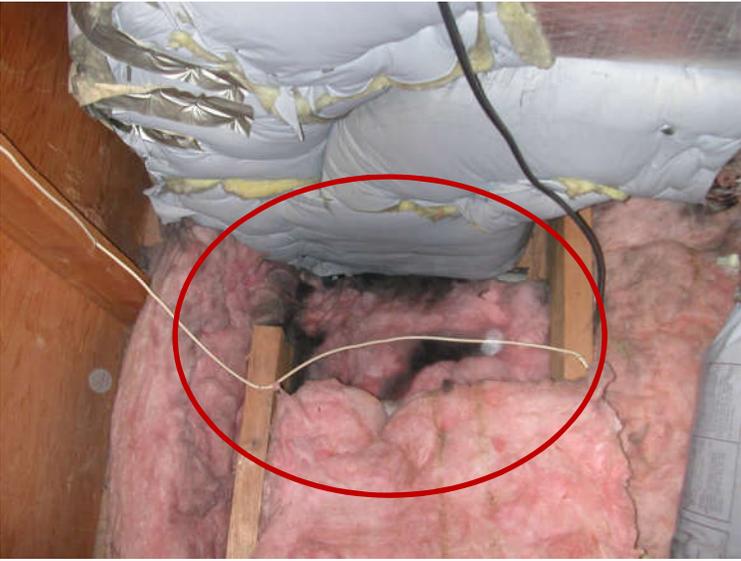


It is Hard in Existing Buildings

Especially after additions or major renovations



Find The Problem



Fix The Problem

Common Problem Area



Fix The Problem

Common Problem Area



Fix the Problem



Fix the Problem



Fix the Problem



Types Of Insulation

- Fiberglass
 - Batt
 - Blown
- Mineral Wool
- Foam
 - Closed cell
 - Open cell
- Cellulose

Rodents



Fire



Outgassing – Blowing Agent



Hydroscopic



How Tight Is To Tight?

How Tight?

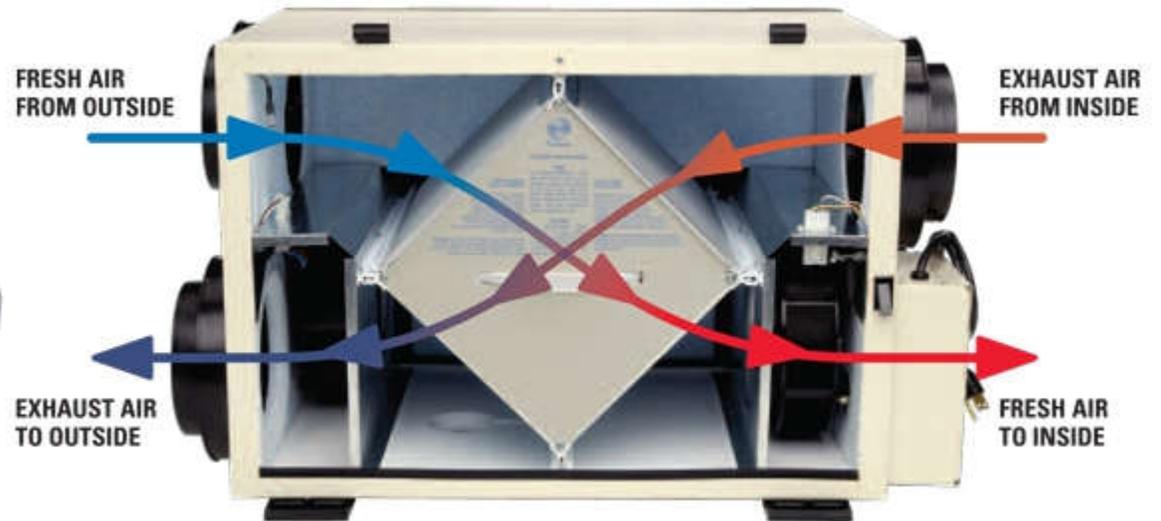


©The Energy Conservatory

How Tight?

ACH50	
7.0	IECC 2009
3.0	IECC 2012
0.6	Passivhaus
3.9	2002 study of 24 new homes in Wisconsin
2.6	Walt's house

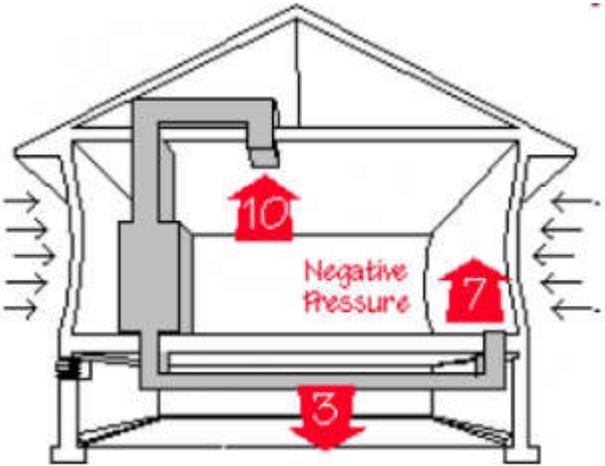
Ventilate Right



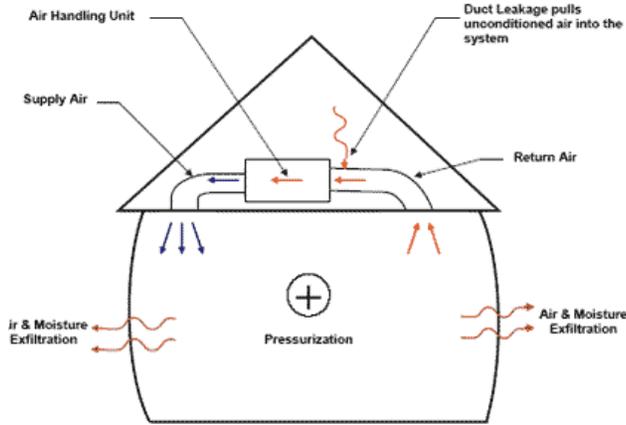
Duct Systems



Duct Systems

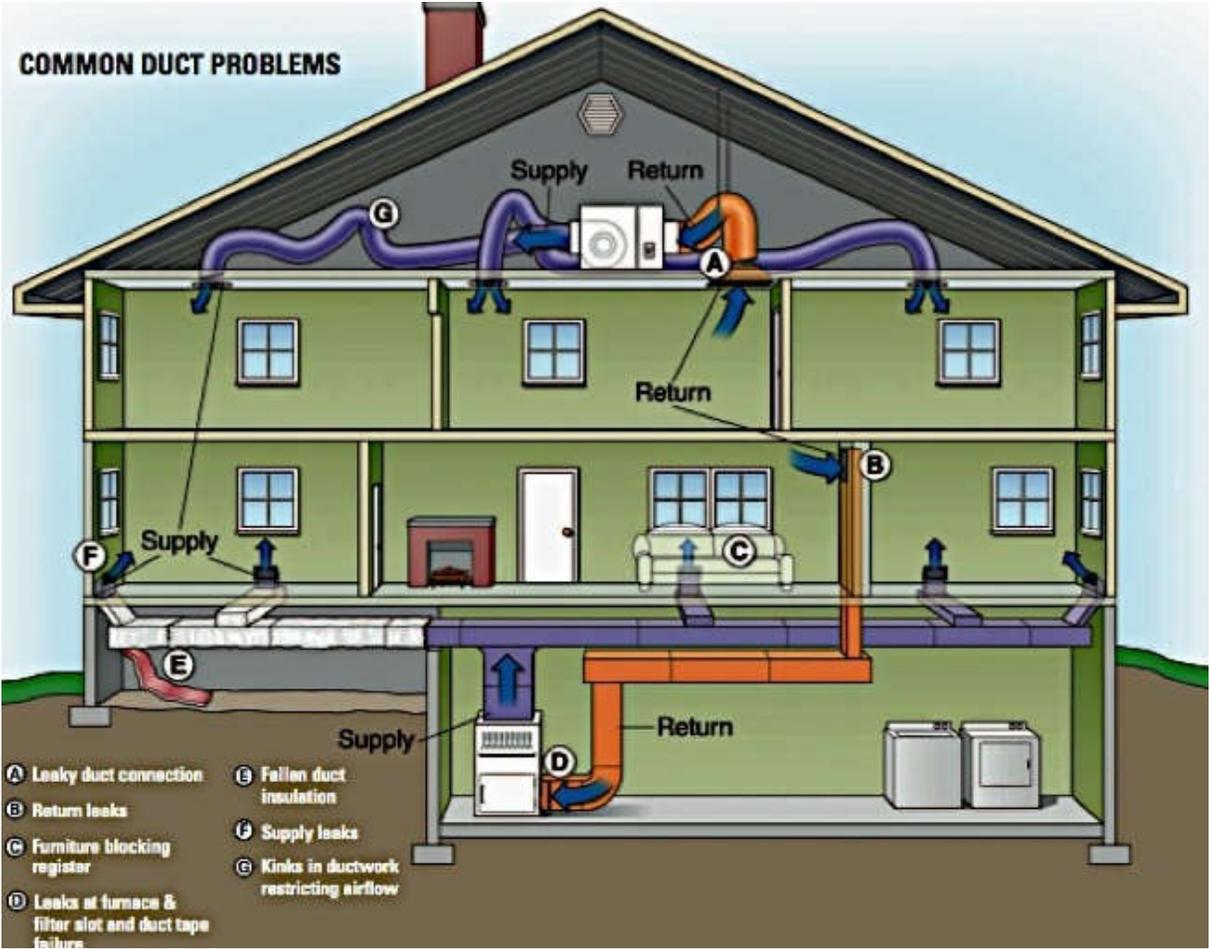


Return Side Leakage



More supply air than return air

Duct Systems



Hydronic Heating Systems



Forced Air Systems



Ductless Heat Pumps



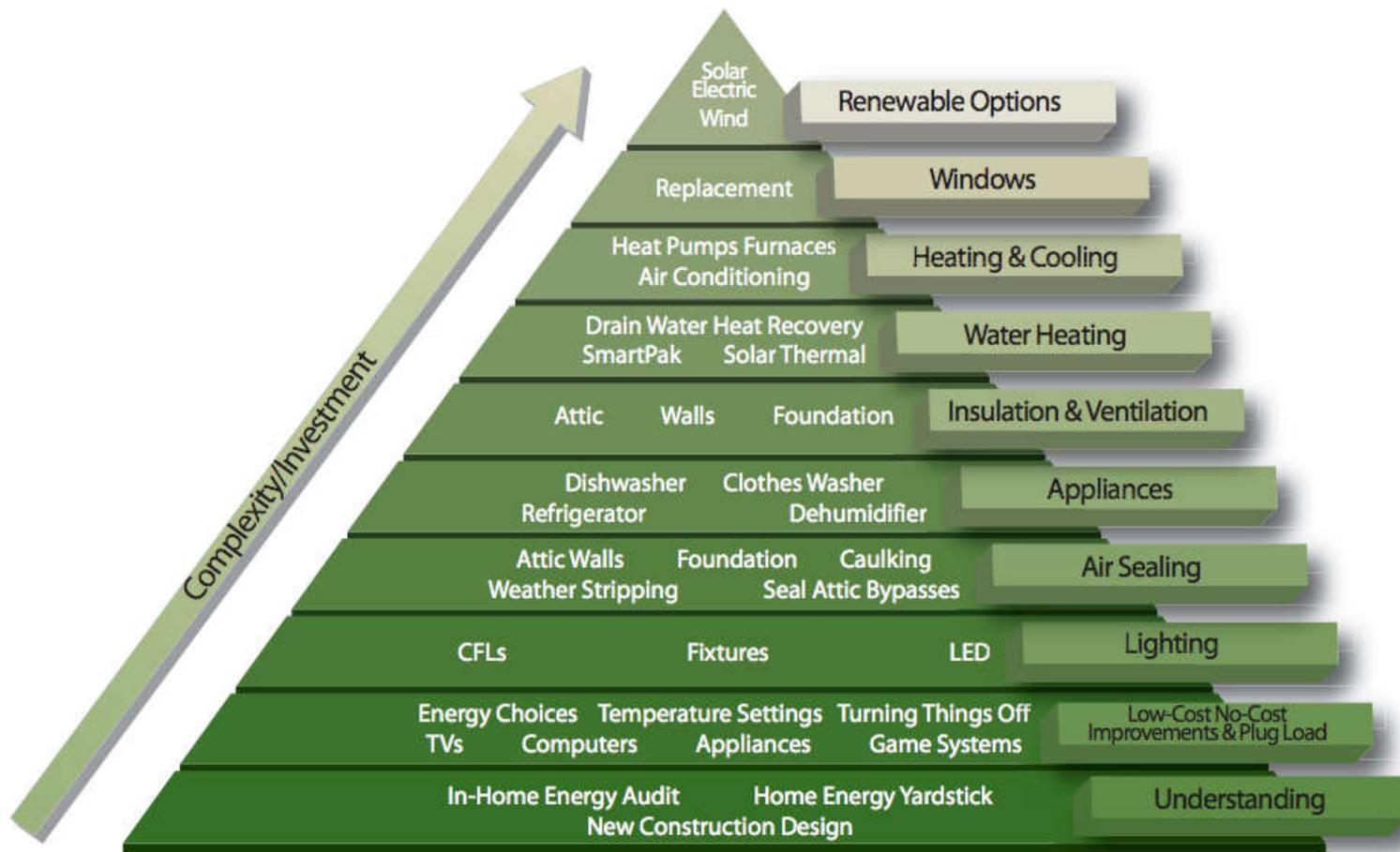
- a COP of about 3.2 to 3.7 at 30°F;
- a COP of about 1.8 to 2.8 at 5°F;
- a COP of about 1.4 at -10°F;
- a COP of "a little above 1.0" at -15°F.

Water Heating



Energy Improvements that Pay for Themselves

Minneapolis Energy Pyramid



The End
Thanks For Coming!