



SCE CANHP Introduction to ENERGY STAR[®] Home Construction

February 15, 2007





Today's Discussion

- What Makes an ENERGY STAR Qualified Home?
- The ENERGY STAR Process

For more information, contact ICF International by phone at (818) 325-3127 or e-mail: CANHP@icfi.com





ENERGY STAR Homes

Building ENERGY STAR Homes: The Basics

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What Makes an ENERGY STAR Qualified Home?

Combine to Make an Efficient Home.

- Tight Construction (Infiltration)
- Air Distribution System (Ductwork)
- Enhanced/Properly Installed Insulation
- High-Performance Windows
- Efficient HVAC Equipment



ENERGY STAR Homes:

- Home Energy Usage Based On:
 - Space Heating
 - Space Cooling
 - Water Heating
- HERS Index
 - 15% more efficient than code translates to a HERS Index of 85

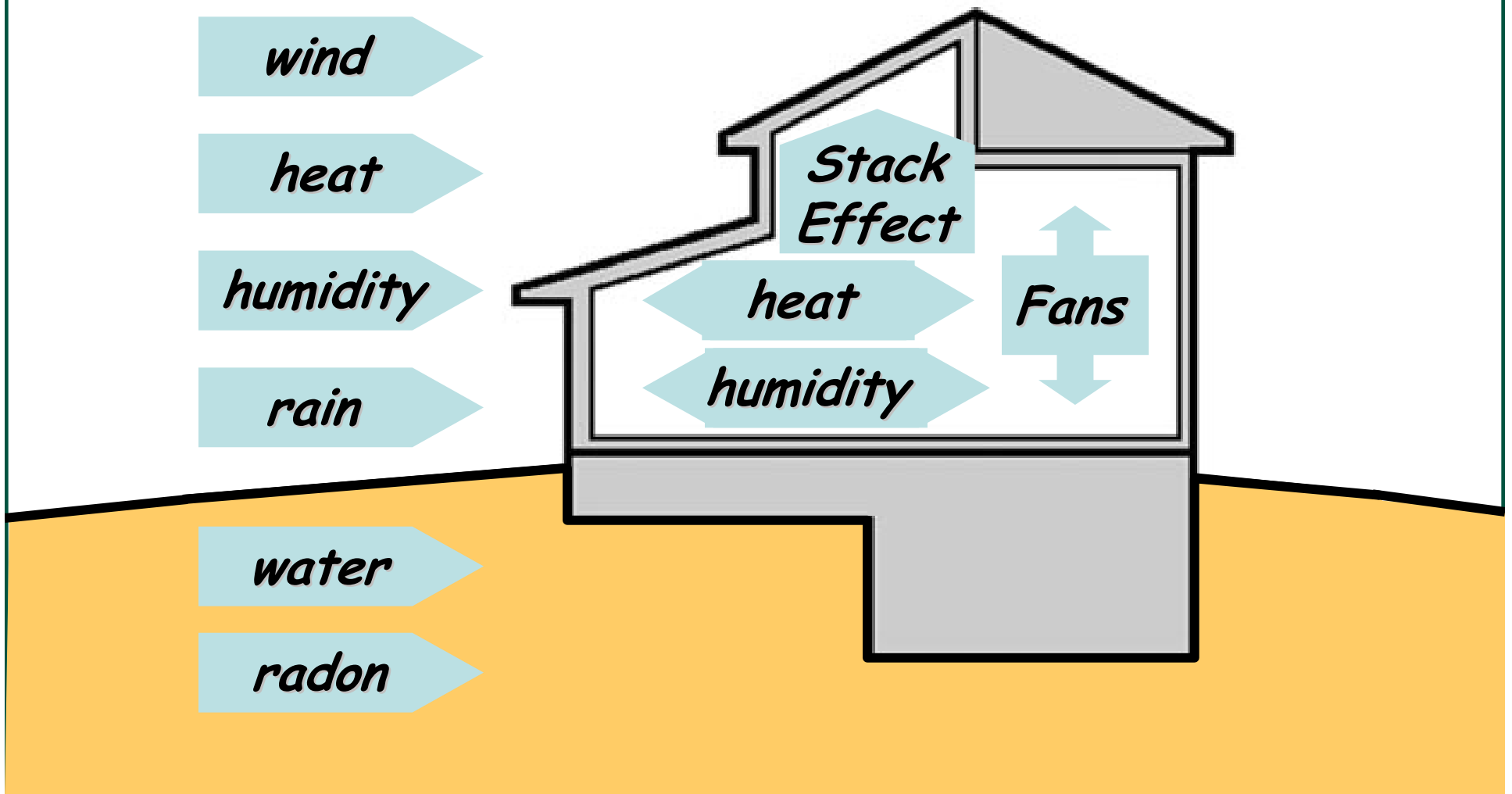


House As A System

- Performance Based
- Looking for Two Key Concepts:
 - Efficient Envelope
 - Improved Insulation Installation, Efficient Windows and Tight Construction Requirements
 - Efficient Distribution
 - Tight Ductwork, Efficient HVAC Systems

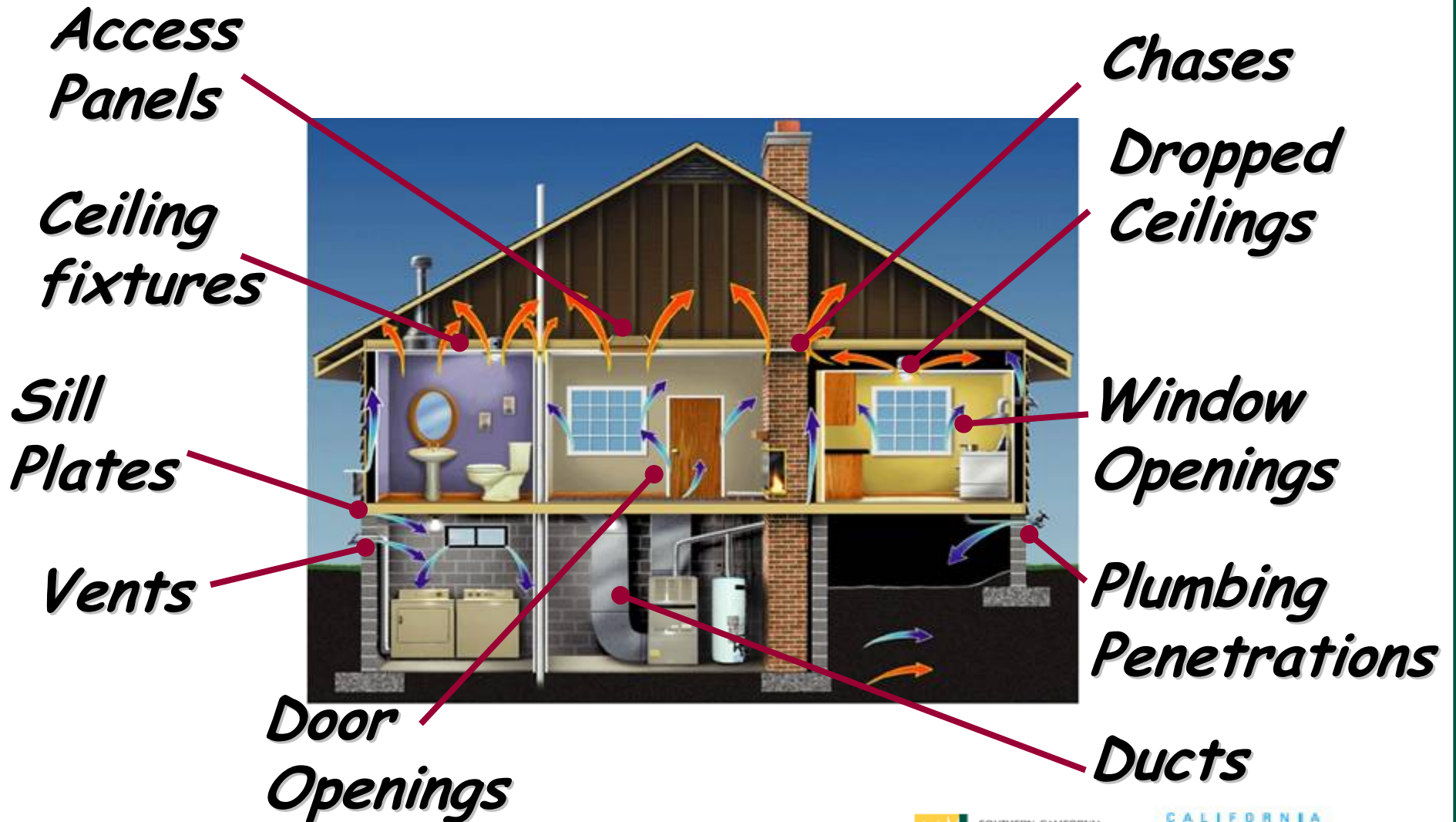


Lots of Driving Forces





Air Leakage



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Tight Construction

- Common Problems
 - Windows & Doors
 - Behind Bathtubs
 - Recessed Light Fixtures
 - Floor Systems / Band Joists
 - Plumbing Penetrations
 - Electrical Penetrations
- Un-designed Holes
 - Shafts / Chases
 - Soffits
 - Floor Systems
 - Dropped Ceilings
 - Cantilevers
 - Ducts







Tight Construction

- Air Sealing Before Drywall
 - Bottom Plate
 - Behind Tub
 - Plumbing Rough Openings
 - Window & Door Rough Openings
 - Electrical Penetrations
 - HVAC Penetrations



Tight Construction



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Insulation is NOT an air barrier

Resists Heat Flow

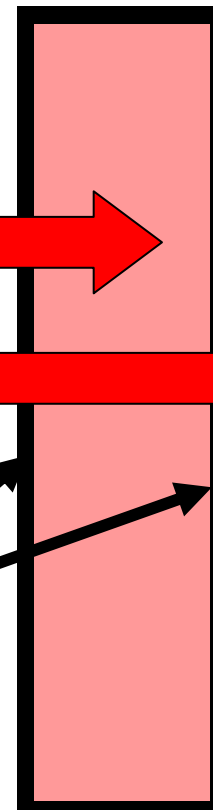


Air Flow



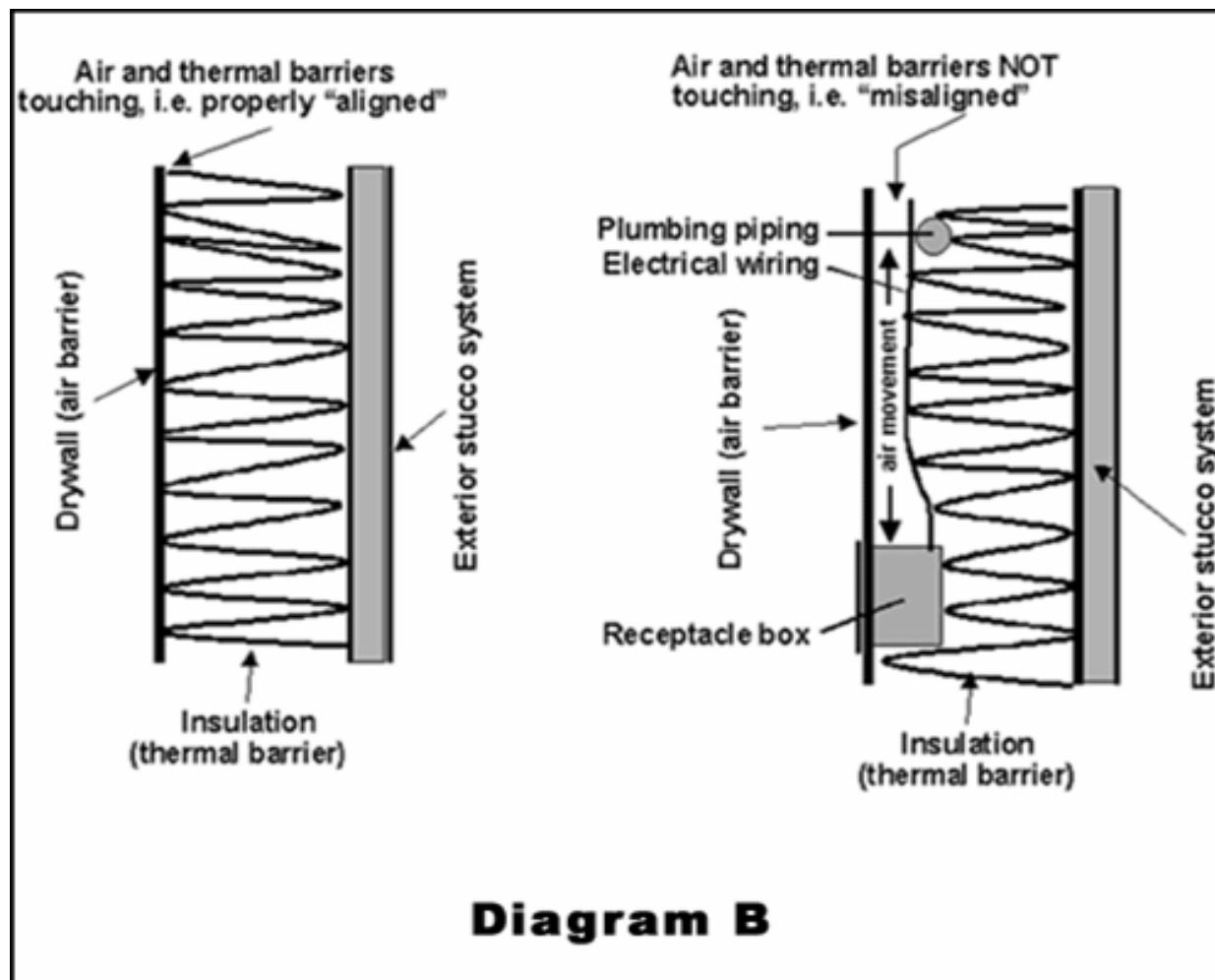
...need Air Barrier

*any solid material that blocks air flow
including sealing at edges and seams*





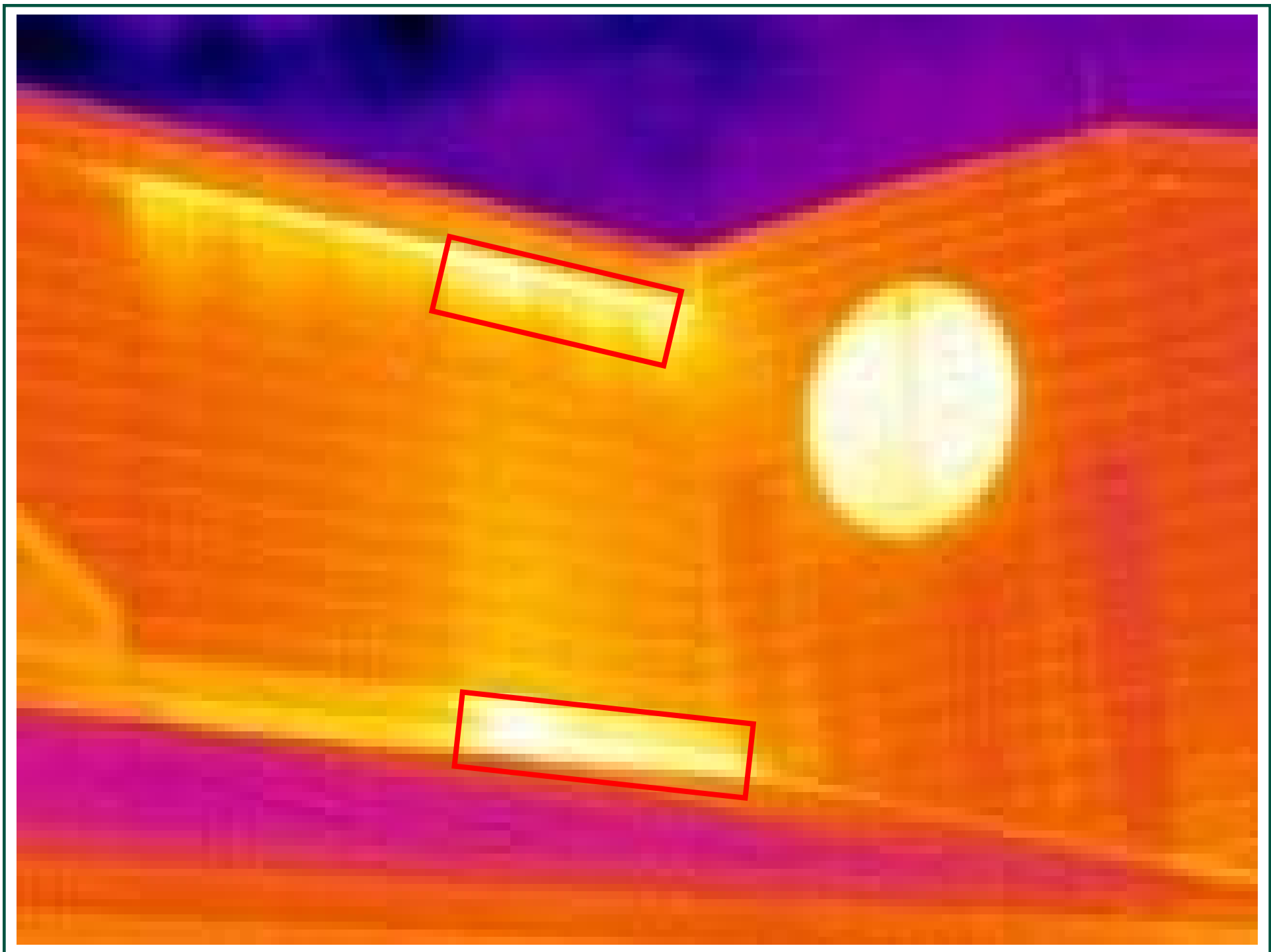
Proper Installation



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Well Insulated



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Well Insulated



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Tight Construction

- Air Sealing After Drywall
 - Caulk Electrical Outlets to Drywall
 - Caulk Light & Fan Fixtures to Drywall
 - Caulk HVAC Boots to Drywall
 - Seal Around Tub Drains w/ Rigid Board/Foam
 - Weather-strip Attic Hatch



HVAC Equipment



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HVAC: Efficiency Basics

- ACCA Manual J Calc
- Room to Room Loads
- Programmable Thermostat
- High Efficiency (SEER, AFUE)





Duct Work: Proper Design

- Ducts Sized Properly
- Avoid Using Building Cavities as Ducts
- Get it Inside Conditioned Space
- Seal With Mastic
- Insulate



Tight Ducts?



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Tight Ducts

- Benefits of Tight Construction & Improved Ventilation
 - Improved Air Distribution
 - Reducing Drafts, Noise, and Moisture
 - Less Dust, Pollen, and Fewer Insects
 - Improved Efficiency and Lower Bills
 - Prolonged Life of Mechanical Equipment

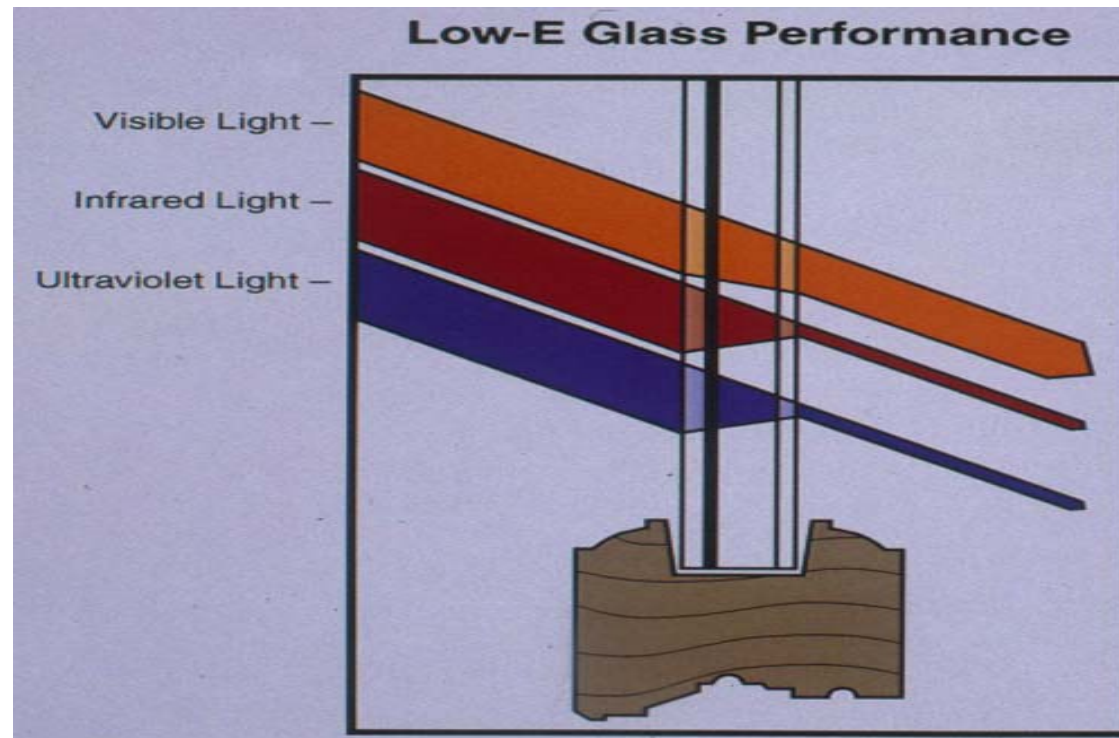


Low-E Windows

- High Performance Windows Improve Energy Efficiency by Reducing Heat Loss
- Low-E Windows: Double-Paneled with Coatings to Keep Out Solar Radiation and Let in Light



Low-E Windows

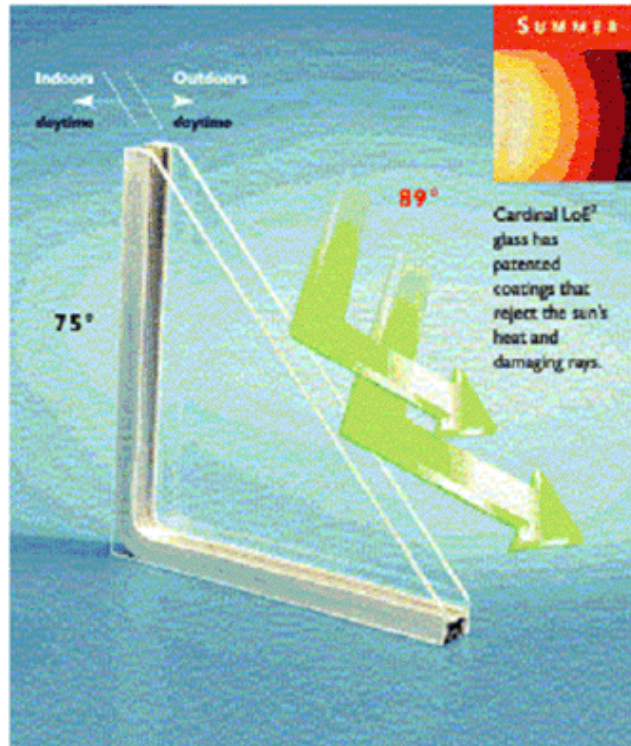


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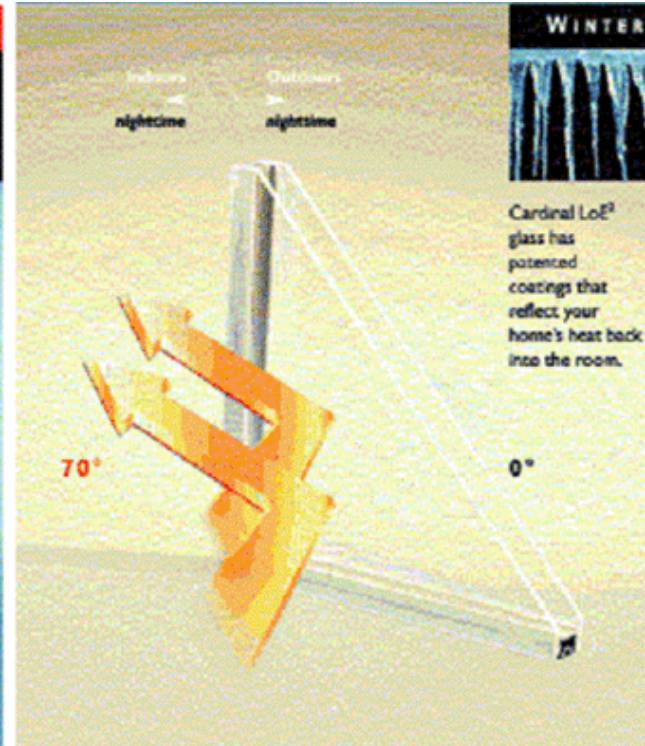




Low-E Windows



Indoors



Indoors

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Low-E Windows



Low-E

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Windows: Installed Incorrectly



Windows with Low E coating on incorrect surface are marked "FLIP"

Courtesy of DR Wastchak, L.L.C.

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ENERGY STAR Appliances

- ENERGY STAR Appliances Include:
 - Dishwashers
 - Refrigerators/Freezers
 - Clothes Washers
 - Dehumidifiers
 - Room Air Conditioners



Summary of Features

Tight Construction

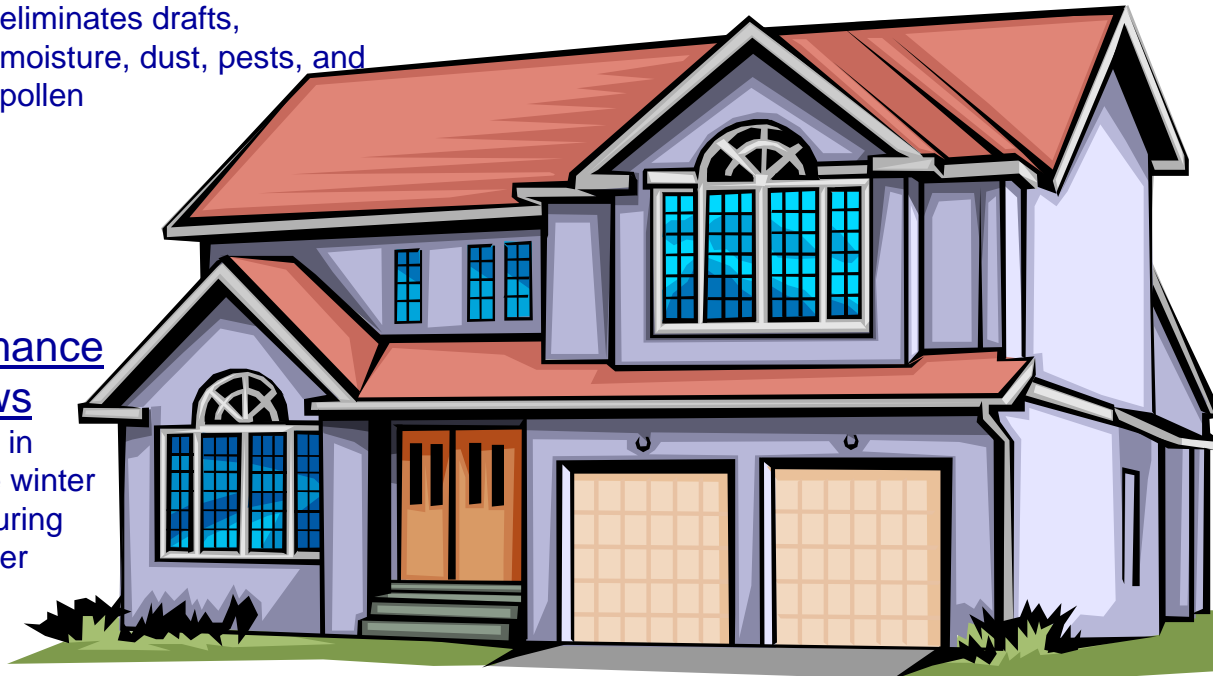
eliminates drafts, moisture, dust, pests, and pollen

Tight Ducts

improve indoor air quality and comfort with less noise

High Performance Windows

keep heat in during the winter and out during the summer



Improved Insulation

blankets the home in comfort and quiet

Energy-Efficient Heating and Cooling Equipment

reduces utility bills and noise while increasing durability

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Certification Procedure Overview

- Determined by the EPA
- Conducted by HERS Raters

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Certification Process

- Plan Analysis
- Inspections
 - Blower Door
 - Duct Blaster
 - Thermal Bypass Checklist
- Generate HERS Index
- Provide Certificate and Label



Step 1: Select a Rater

- Visit a HERS Provider website (CHEERS, CaCERTS, CBPCA)
- Select an Accredited HERS Rater
- Your T24 consultant can also provide technical support



Step 2: Plan Analysis

- Builder Determines Where to Implement Energy-Efficient Improvements Through Plan Review and Analysis with Rater
- Plan is determined to meet ENERGY STAR requirements



Step 3: Construction

- Homes are constructed based on ENERGY STAR compliant specifications
- HERS process is applied throughout (1R, 6R, 4R forms as required)



Step 4: Final Inspection



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Step 5: Rater Prints Certificate and Label

- Rater Applies ENERGY STAR Label to Breaker Box of Every Inspected and Certified Home.
- A Certificate With the Home's HERS Index is Provided to the Homebuilder



Benefits

- Increased Homeowner Comfort
- Lower Homeowner Utility Bills
- Fewer Call-Backs
- Sub-Contractor Evaluation
- Differentiation from Other Builders



Benefits

Trusted Symbol
that Makes it **Easy** for Consumers
to Identify Energy-Efficient Products
Including HOMES!



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More Information: Q & A

SCE California New Homes Program

<http://www.sce.com/Builder>

CANHP@ICFI.com

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