

Energy Efficient Construction

Energy Efficient Construction Case Study Presentation

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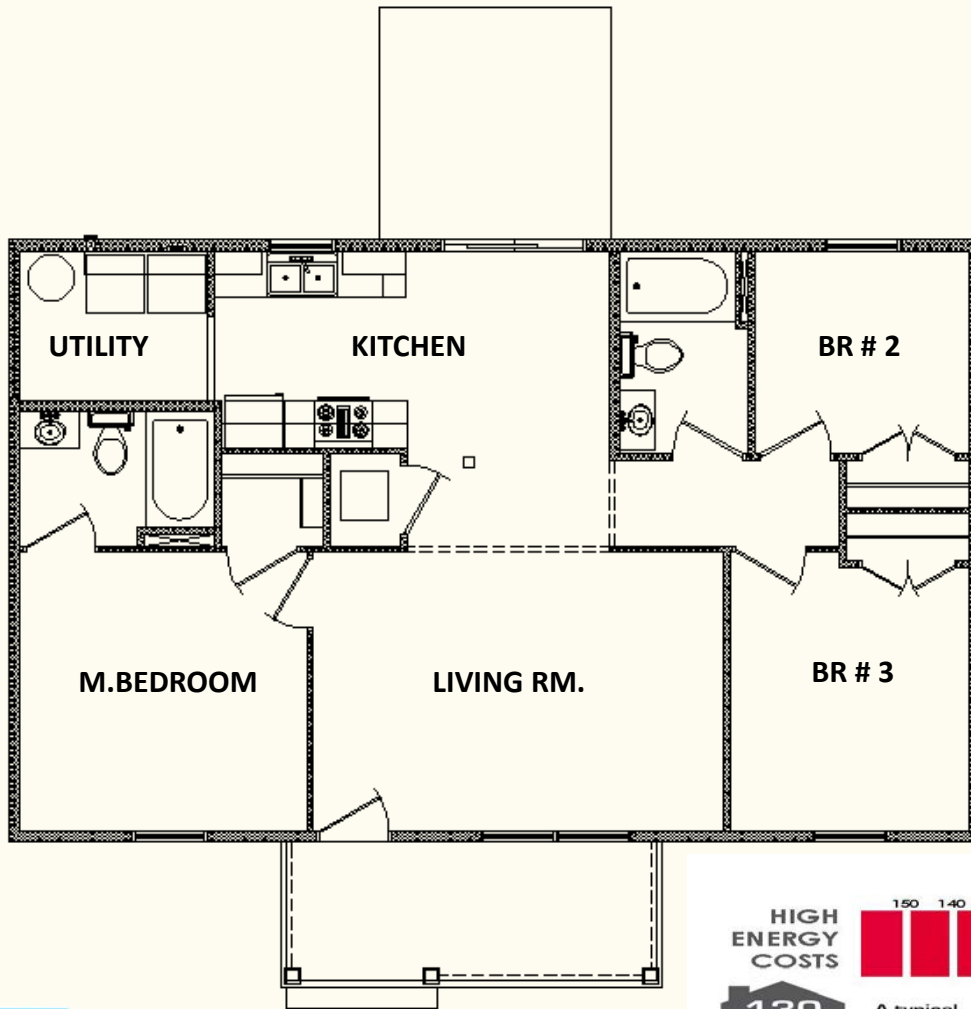
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The Anderson



Plan Features:

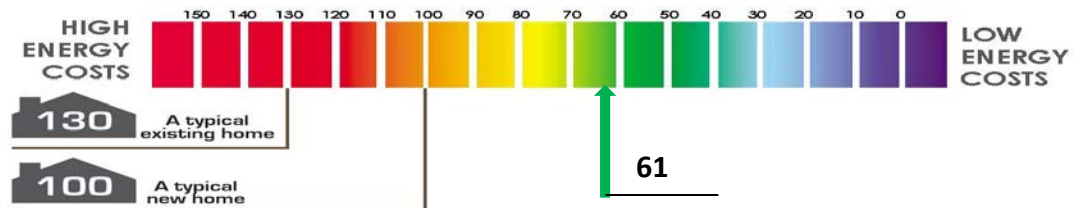
Dimensions: 26'-0" x 42'-0"

Square Footage: 1092 Sq. Ft. Living Space

Bedrooms: 3

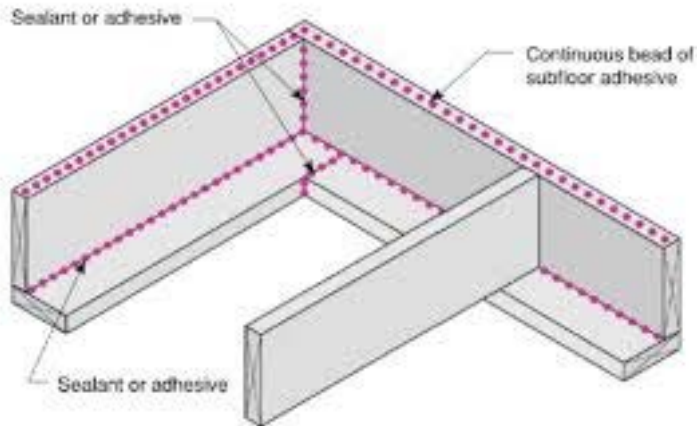
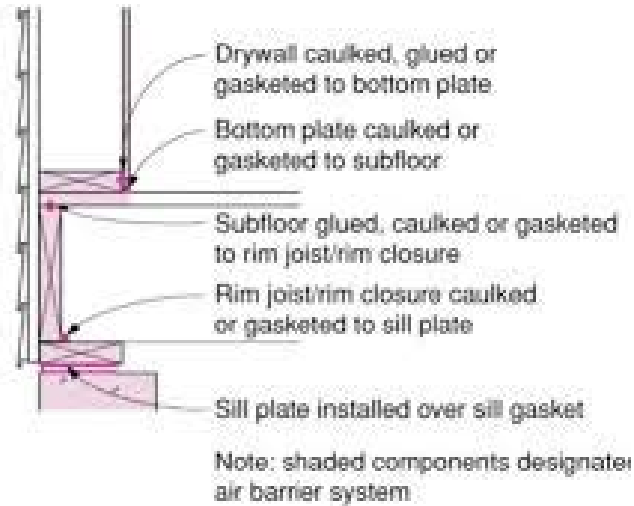
Bathrooms: 2

- ☐ Complies with Universal & Minimum Design
- ☐ Energy Star Version 3.0 Compliant
- ☐ HERS 61 (Range 60-66 Typically)



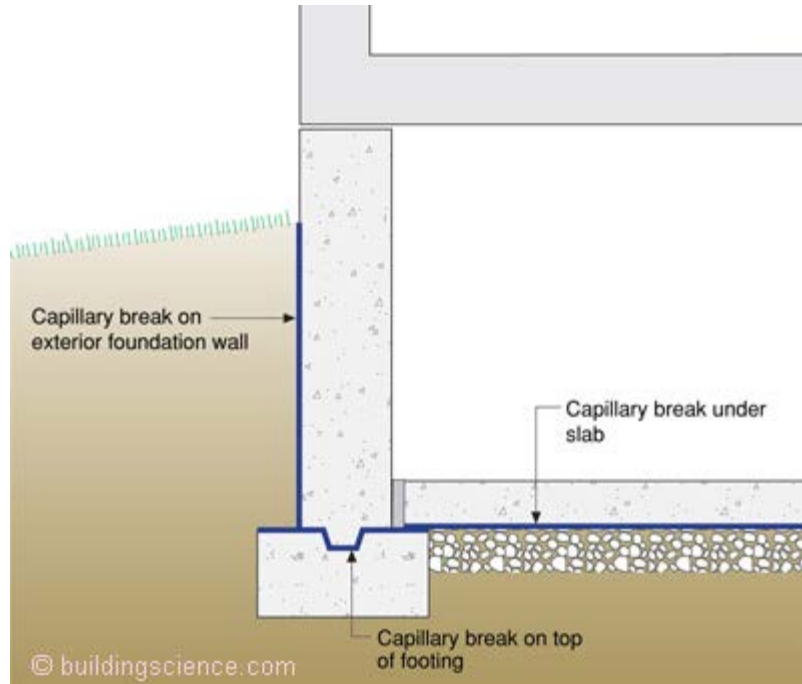
Building Envelope

Foundation & Floor System's



Building Envelope

Foundation & Floor System's



Capillary Breaks:

Some of the tiniest pores can be found in wood, concrete, mortar and brick.

Common Building Material....

Capillary Rise in concrete is about 6 miles

Capillary Rise in wood is about 400 feet

How do leaves get water?

Capillary Suction is powerful.

Building Envelope

Wall Assembly



DOW Structural
Insulated Wall
Sheathing- Tape all
joints

R-Values
Sheathing: 5
Wall Stud: 19
Total: R-24



2x4 Wall Assembly

R-Values
Sheathing: 5
Wall Stud: 13
Total: 18

2x6 Wall Assembly

R-Values
Sheathing: 5
Wall Stud: 19
Total: 24



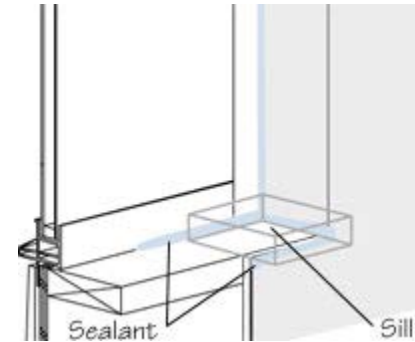
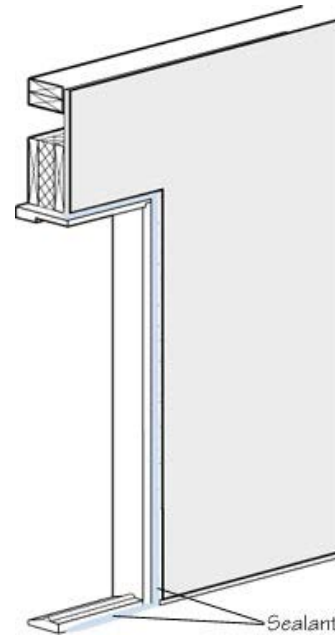
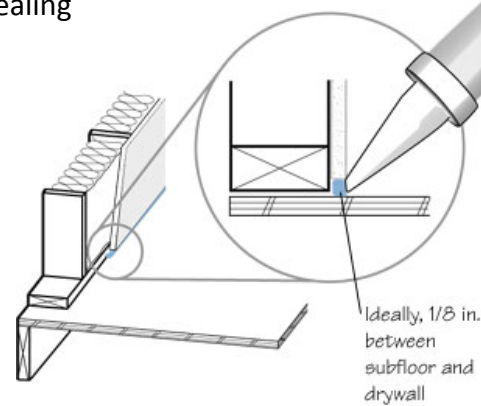
2x4 Wall Assembly

R-Values
Wall Stud: 17
Total: 17

2x6 Wall Assembly

R-Values
Wall Stud: 27
Total: 27

Advanced Air Sealing



Building Envelope

Wall Assembly



Raised Heel Energy Truss with Air Baffles & Draft-stop

Caulk all top plates

Fiberglass Wall Insulation

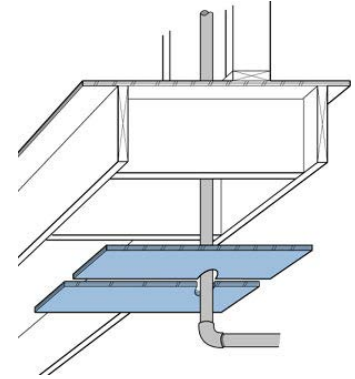
Caulk all wood framing around windows & doors

Caulk all bottom plates

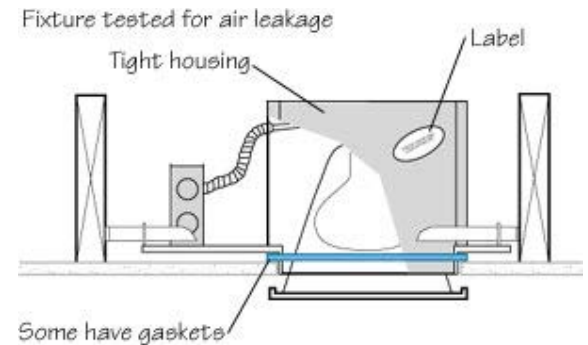
Glue all floor sheathing to the floor joist



Caulk all wall , floor and ceiling penetrations



Plumbing Vent or Drain Detail



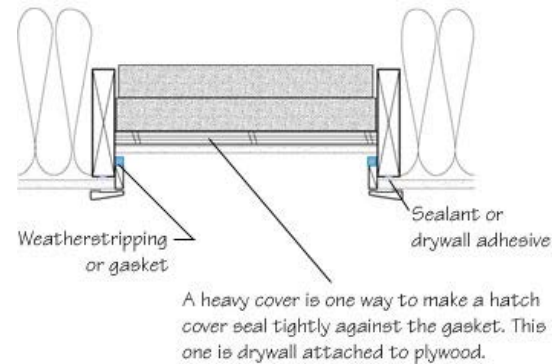
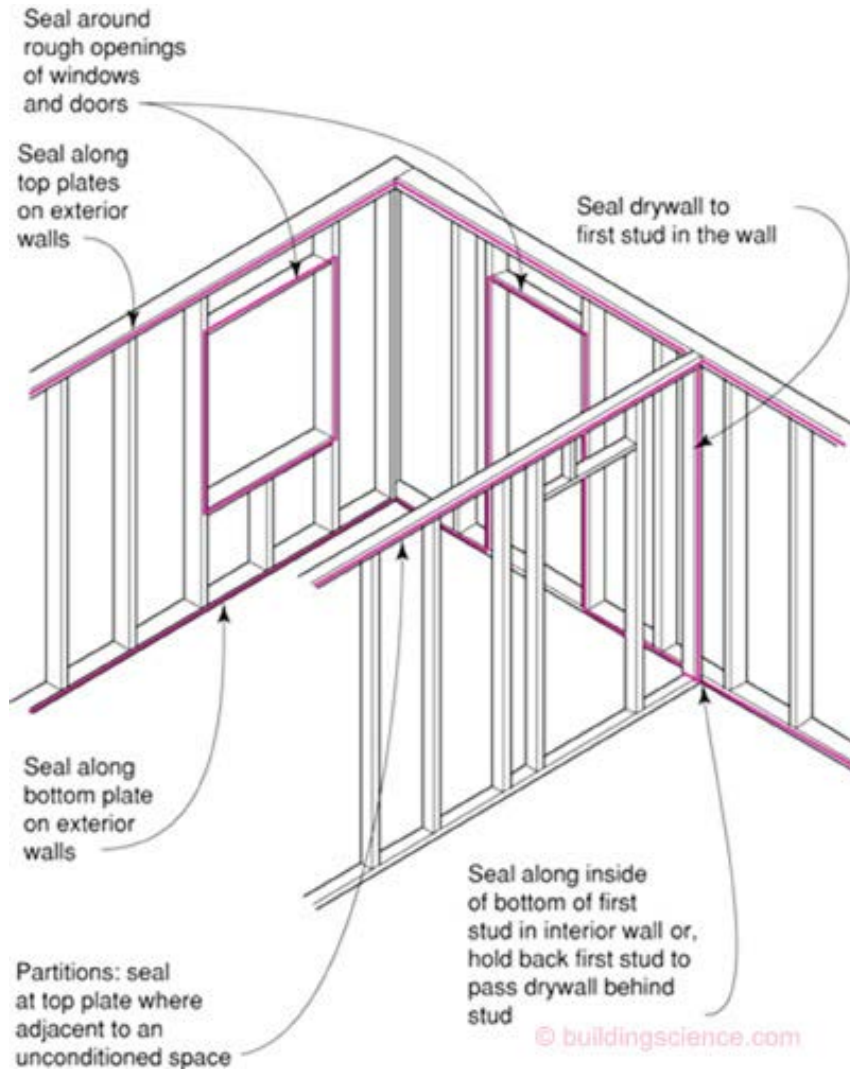
Air Tight Can Lights

Windows

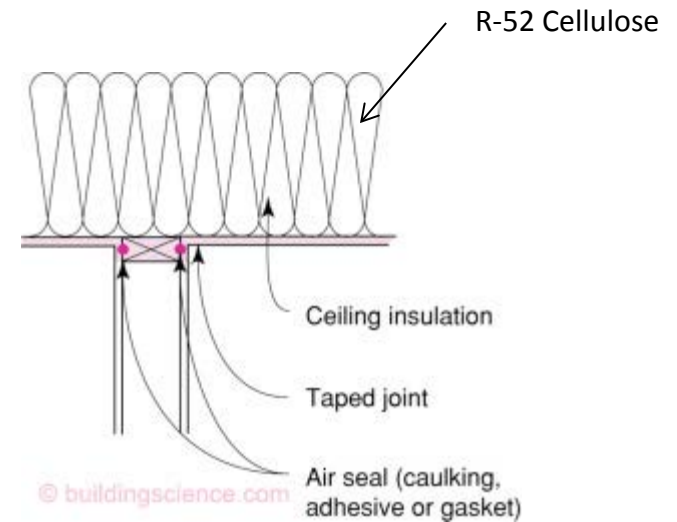


Building Envelope

Roof Ceiling Assembly



Attic Access Details



HVAC

Mechanical System Features:

Air-Source Heat Pump

Electric

Heating 9.0 HSFP

Cooling 16.2 SEER

R-8 Ducts

Spot Ventilation

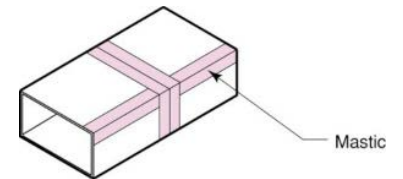
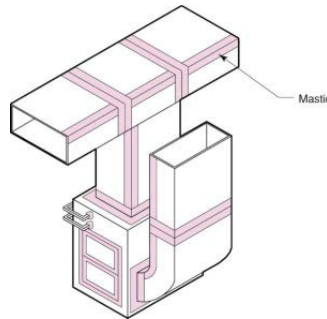
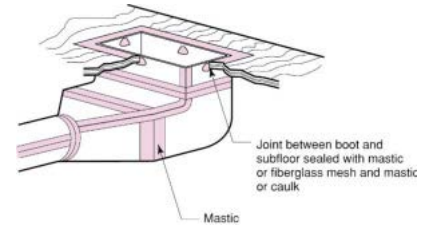
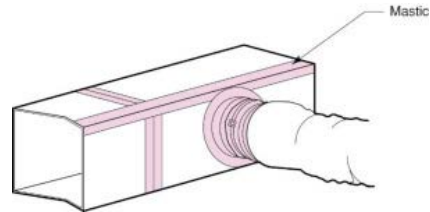


HVAC

Mechanical System Features:

Air Sealing

Tape & Mastic



HVAC

Mechanical System Features:

Typically we use Panasonic ERV

- ✓ One will typically work
- ✓ We have used multiple units (typically 2 story designs)
- ✓ We have ran into issues on Hip Roofs & Metal Roof Construction



Water Conservation

Water Closet: Avg. Flow Rate 1.3 GPF

Faucets Avg. Flow Rate of 2.0 GPM

Water Heater: Rheem Self Cleaning 0.92 EF, 40 Gal.

Water Pipe Insulation: R-4



Appliances

Refrigerator (Energy Star Qualified)

Dishwasher (Energy Star Qualified)

Lighting

- Ceiling Mount Energy Star Qualified
- Can Lights
- Fluorescent Header Mounts (Closets)

Washer (Energy Star Qualified)



Performance

Air Leakage:

CFM 50 (House size independent)

Infiltration Rate: Htg: 812 Clg: 812



Estimated Annual Energy Cost

Use	MMBtu	Cost	Percent
Heating	10.8	\$230	25%
Cooling	2.6	\$56	6%
Hot Water	10.5	\$224	25%
Lights/Appl.	15.6	\$334	37%
Photovoltaics		0	\$0
Service \$		\$60	7%
Total	39.5	\$904	100%

Heating Cooling Cost \$0.78/day



Performance Electives

Below is a list of Elective that is used to reduce the energy consumption and lower the HERS Index

Envelope

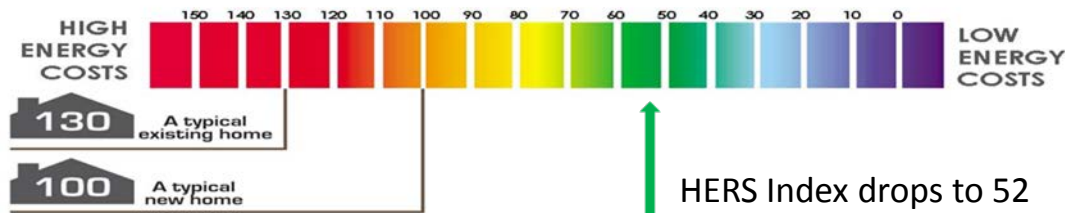
- ✓ Condition the mechanical spaces for ducts (crawl space or within the building envelope)

Air Leakage goes from 812cfm – 723cfm

Duct Leakage goes from 19 cfm – 15cfm (*within the conditioned space*)

Mechanical

- ✓ Mini-Split HVAC (optional we typically use Heat Pump)
- ✓ GeoSpring Hybrid Water Heater



Questions...

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