

CASE STUDY HOUSES

**PEOPLE'S SELF-HELP
HOUSING, INC.**



Prologue

MOISTURE in HOMES

PROBLEMS WITH MOISTURE

- 1. Mold**
- 2. Building Deterioration**
- 3. Pests** – dust mites, bed bugs, termites, roaches
- 4. Comfort**

SOURCES OF MOISTURE

1. Rain Water

2. Ground Water

3. Air

Outdoor

- Uncontrolled rain water or ground water turns into humid air.
- High outside humidity during warm months

Indoor – Occupant dependant

- Cooking and not using rangehood
- Bathing and not using bathfan
- Unvented combustion appliances
- Humidifiers
- People, pets, and plants

4. Vapor Diffusion

MOISTURE IN ENERGY EFFICIENT HOMES



ENERGY STAR® Qualified Homes

WATER MANAGEMENT SYSTEM BUILDER CHECKLIST GUIDE

MOISTURE IN ENERGY EFFICIENT HOMES, Cont.

SUMMER

Air sealing helps!

Air sealing keeps HUMID AIR outside

Whole house ventilation still needed

Contaminants such as VOCs, carbon dioxide, and chemical fumes still need to be exhausted. **Do not over ventilate.**

Spot ventilate

Bathing and cooking creates air that is typically more humid than outside.

Open Windows?

Opening windows lets in humid air, but it also usually increased indoor air temperature which lowers relative humidity. Increased air circulation warms surfaces and promotes drying. However, when it is extremely humid, air conditioning may be needed to control moisture.

MOISTURE IN ENERGY EFFICIENT HOMES, Cont.

AIR CONDITIONING

Both cools and dehumidifies

Cooling Load

In energy efficient houses cooling load is reduced:

- More insulation
- Better air sealing
- Better windows with lower Solar Heat Gain Coefficients which block solar heat.
- Larger overhangs shade the house.

Dehumidification Load

In energy efficient houses dehumidification load is reduced:

- Better air sealing

MOISTURE IN ENERGY EFFICIENT HOMES, Cont.

AIR CONDITIONING

Oversized air conditioners don't dehumidify

To dehumidify air conditioners need:

- Low coil temperature
- Low fan speed

An oversized air conditioner cools and turns off before the coil temperature gets cool enough to remove moisture.

AIR CONDITIONING

Must be properly sized!

Manual J Calculations:

Total Area	Construction Components	HEAT LOSS		HEAT GAIN	
106	Windows & Glass Doors	1908	9.78%	2840	31.64%
	Skylights				
40	Wood & Metal Doors	648	3.32%	281	3.13%
1678	Above Grade Walls	6597	33.80%	1303	14.52%
	Partition Walls				
	Below Grade Walls				
1248	Ceilings	1498	7.67%	1248	13.90%
	Partition Ceilings				
	Passive Floors				
	Exposed Floors				
152	Slab Floors	3238	16.59%		
	Basement Floors				
	Partition Floors				
	Infiltration	2380	12.19%	317	3.53%
	Internal Gains			2120	23.62%
	Duct Loss & Gain				
	Ventilation	3251	16.65%	867	9.66%
	Blower Heat Gain				
	Total Sensible	19518	100.00%	8977	100.00%
	Total Latent			2493	
	Total Cooling Load			11469	

AIR CONDITIONING

6-1. COOLING CAPACITY

■ MODEL: ASU9RLS2

AFR	500
-----	-----

		Indoor temperature											
		°FDB	64			70			75			80	
		°FWB	54			60			63			67	
Outdoor temperature	°FDB		TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC
	67		8.4	6.0	0.38	9.4	6.0	0.39	10.3	6.6	0.40	10.7	7.1
	77		8.0	5.7	0.44	8.9	5.7	0.44	9.8	6.2	0.45	10.2	6.7
	87		7.6	5.4	0.49	8.4	5.4	0.49	9.3	5.9	0.50	9.6	6.4
	95		7.1	5.1	0.54	7.9	5.1	0.55	8.7	5.6	0.56	9.0	6.0
	104		6.0	4.5	0.50	6.7	4.5	0.51	7.4	4.9	0.52	7.6	5.3
	115		5.5	4.2	0.50	6.2	4.2	0.51	6.8	4.6	0.52	7.0	5.0

AFR : Air Flow Rate (CFM)

TC : Total Capacity (kBtu/h)

SHC : Sensible Heat Capacity (kBtu/h)

MOISTURE IN ENERGY EFFICIENT HOMES, Cont.

WINTER

Ventilation helps

Ventilation with winter air will dry inside air. However, too much ventilation will negatively affect energy efficiency

Increased wall cavity insulation increases the likelihood of moisture problems.

Because it is better insulated from the inside, exterior sheathing is colder condensation is more likely.

Exterior Insulation good!

Insulation on the outside of sheathing warms the sheathing making condensation less likely

Air Sealing is good!

If warm, moist air can't get to the exterior sheathing condensation is less likely.

MOISTURE IN ENERGY EFFICIENT HOMES, Cont.

VAPOR PERMEABILITY

Allow walls to dry

Most walls, at some point, will get moisture in them. Use building materials that allow walls to dry. In a mixed-humid environment, allow wall to dry to both sides.

In walls avoid:

Faced batts

Foil faced insulation

Vapor barriers such as polyethylene sheeting

Vinyl wall paper

Oil based paints

Thick EPS insulation

ADAMS HOUSE

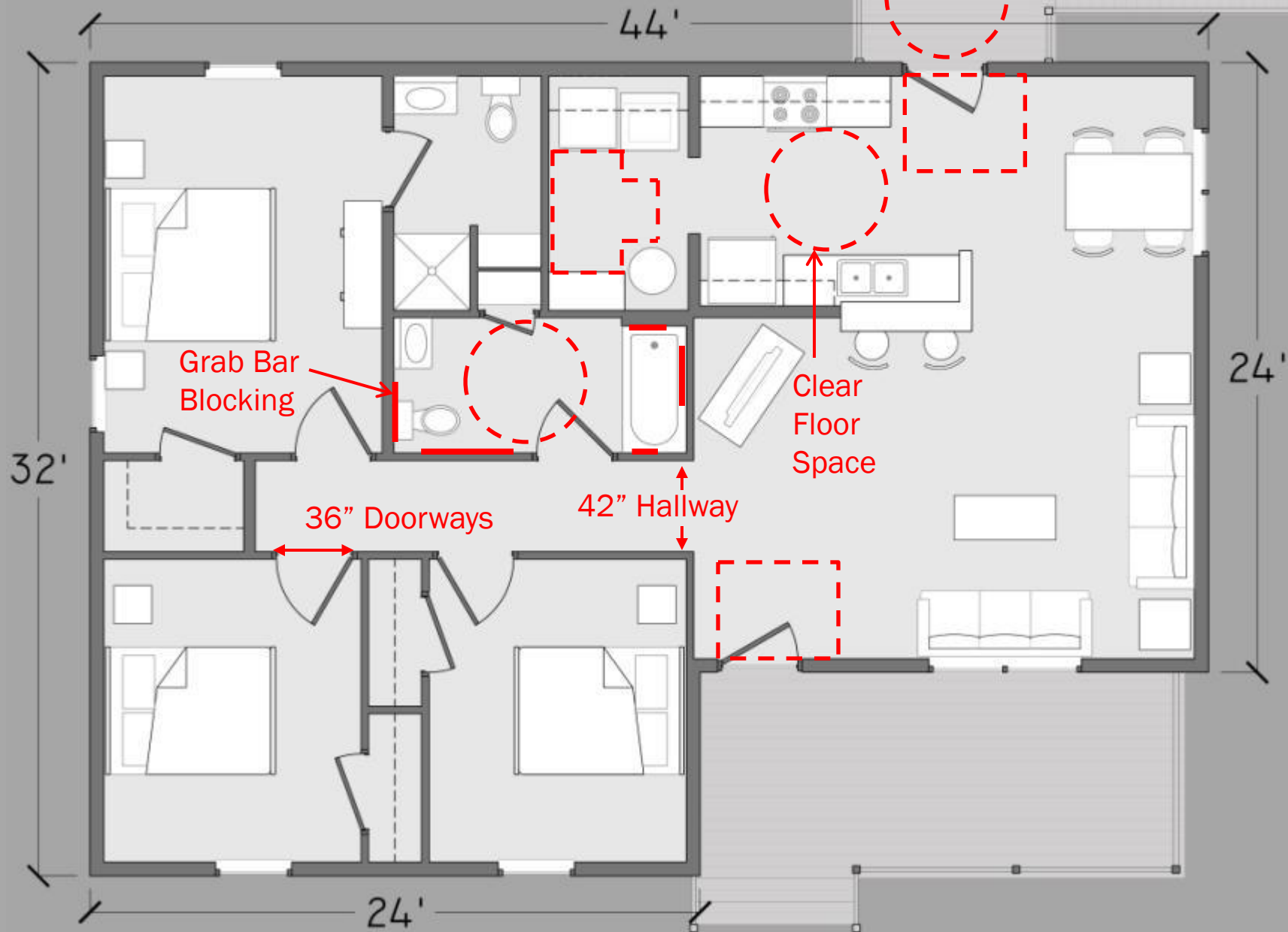
3 Bedroom / 2 Bath
1248 SF



FLOOR PLAN



UNIVERSAL DESIGN



BUILDING ENVELOPE

FOUNDATION

- Conditioned crawlspace
- 8" Concrete masonry walls
- R-10 Spray foam insulation on crawlspace walls on rim joist

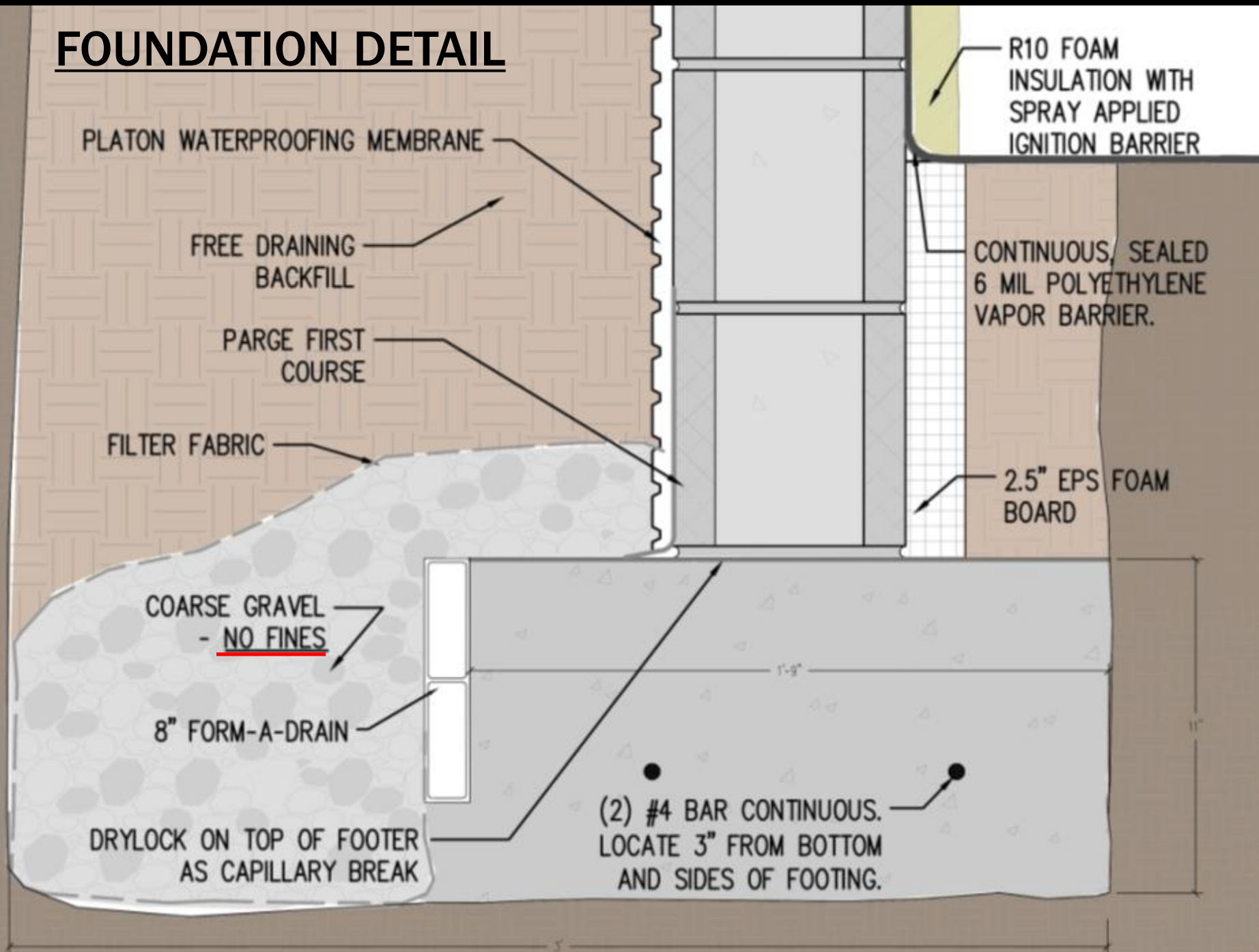
WALLS

- 2x6 Advanced framing with Zip-R sheathing
- R-19 Fiberglass batt insulation in wall cavities
- R-3.6 Continuous insulation attached to wall sheathing

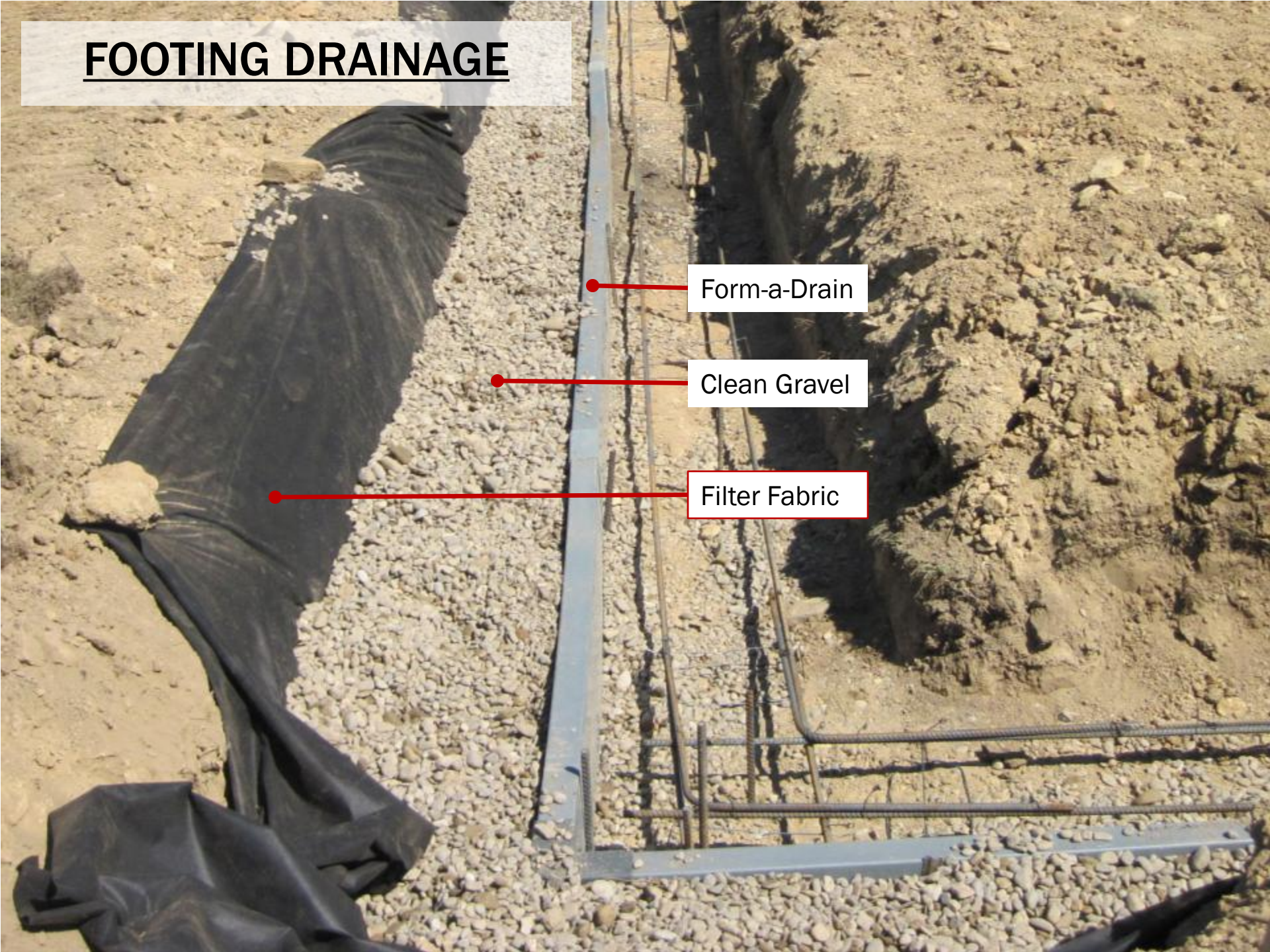
CEILING

- Raised heel/energy trusses
- R-50 blown-in cellulose insulation

FOUNDATION DETAIL



FOOTING DRAINAGE



Form-a-Drain

Clean Gravel

Filter Fabric

DIMPLED MEMBRANE



Dimpled Membrane

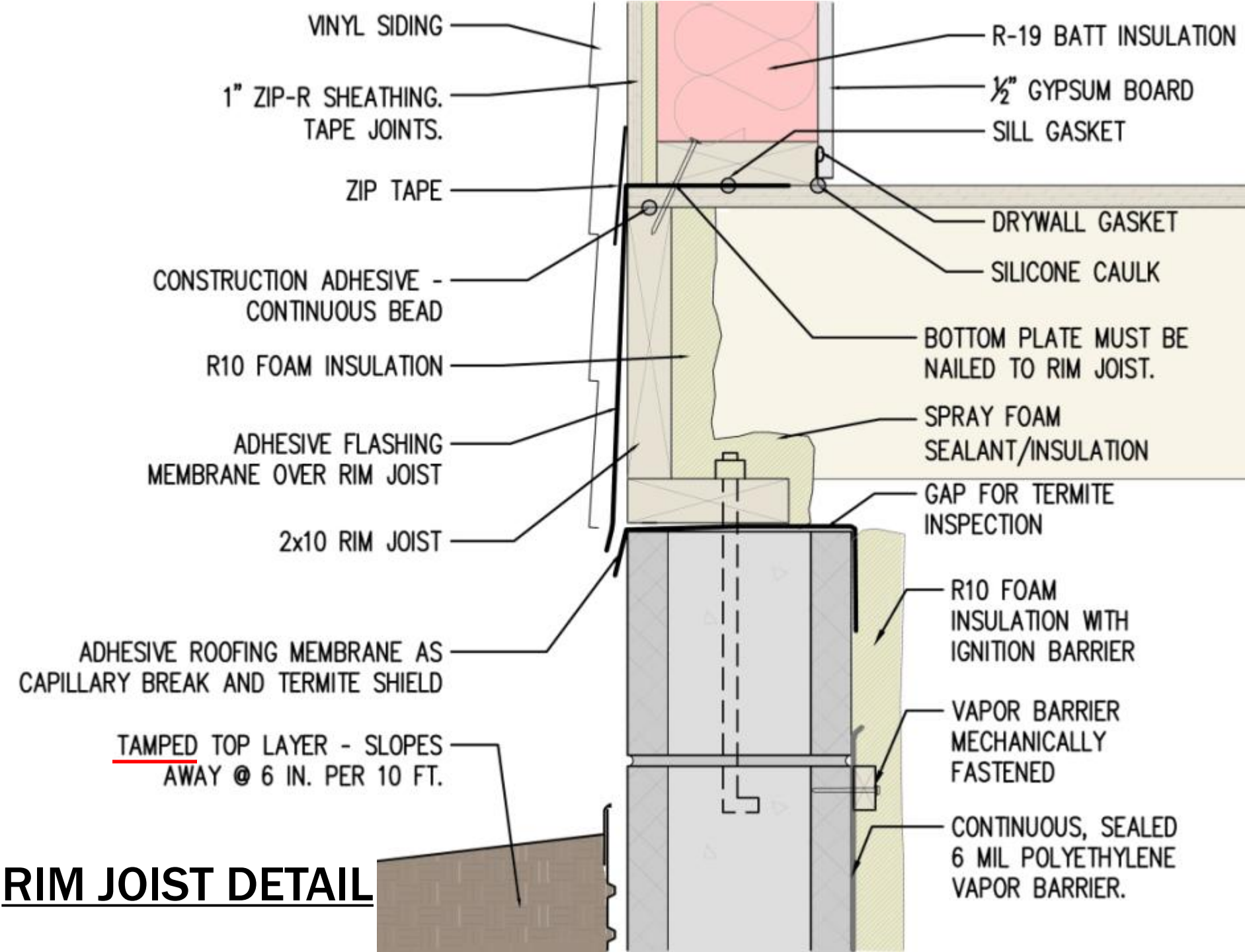
Parged First Course



DIMPLED MEMBRANE



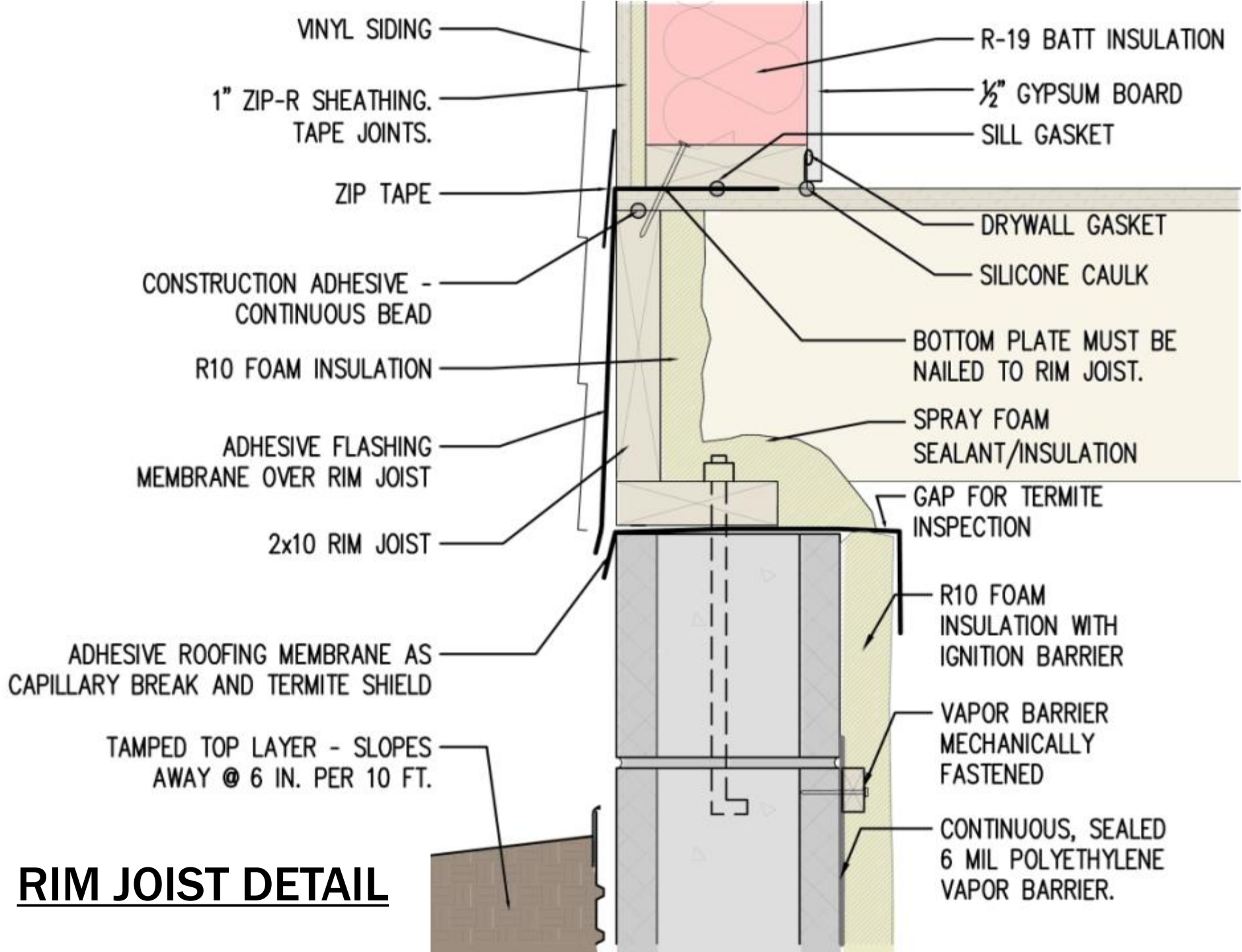
PIER BOOT



RIM JOIST DETAIL



FOUNDATION SPRAY FOAM

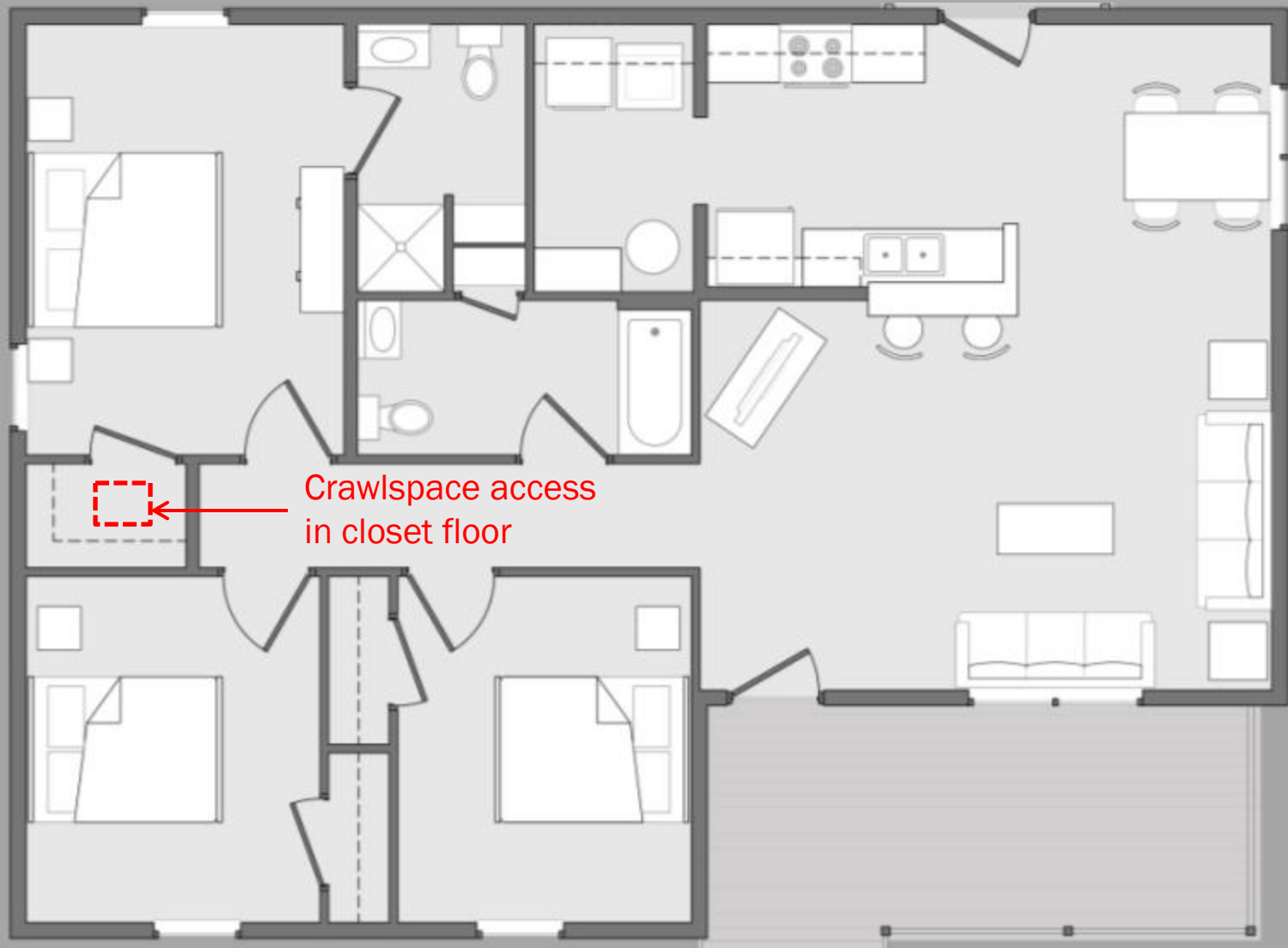


RIM JOIST DETAIL



FOUNDATION INSULATION

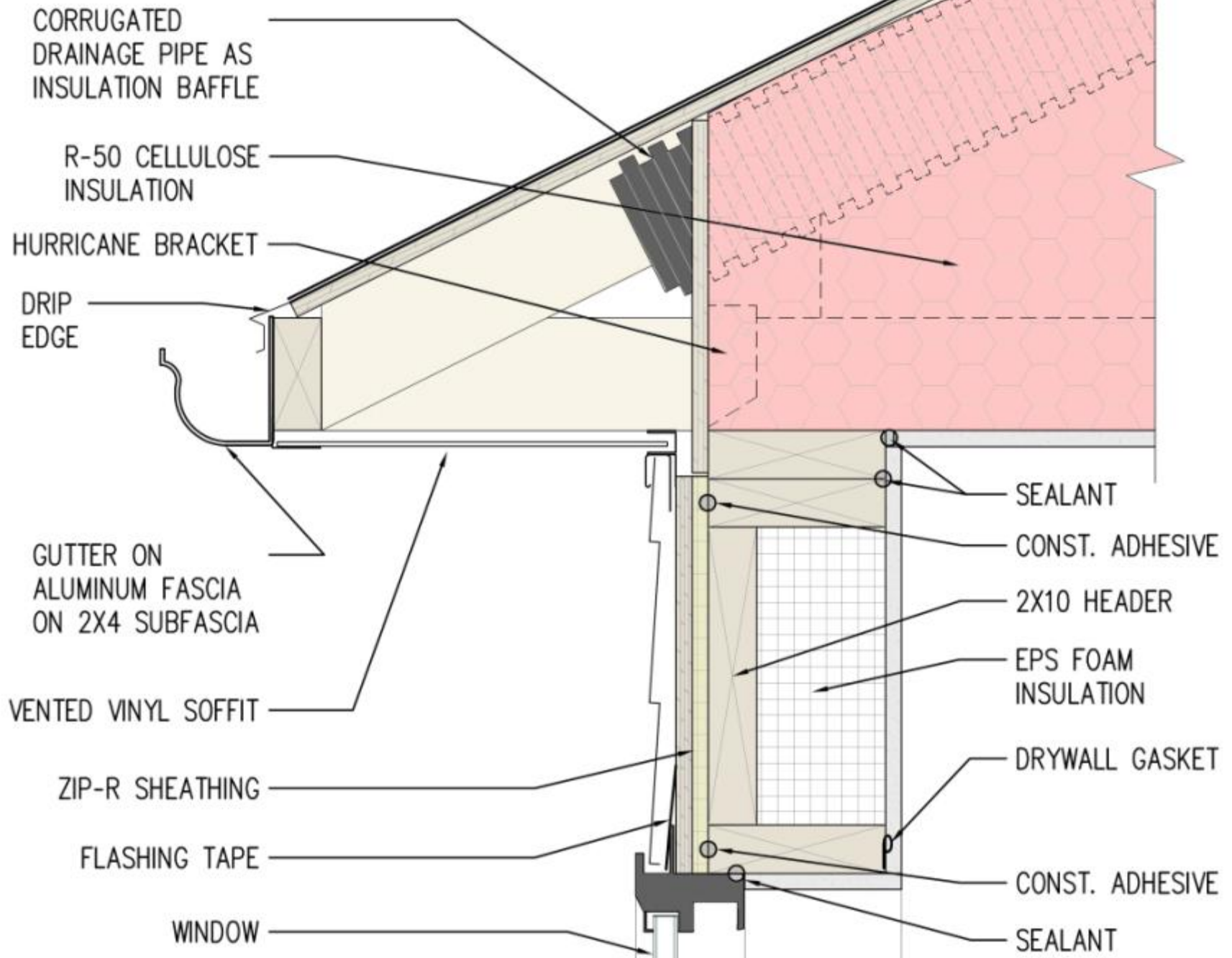
CRAWLSPACE ACCESS



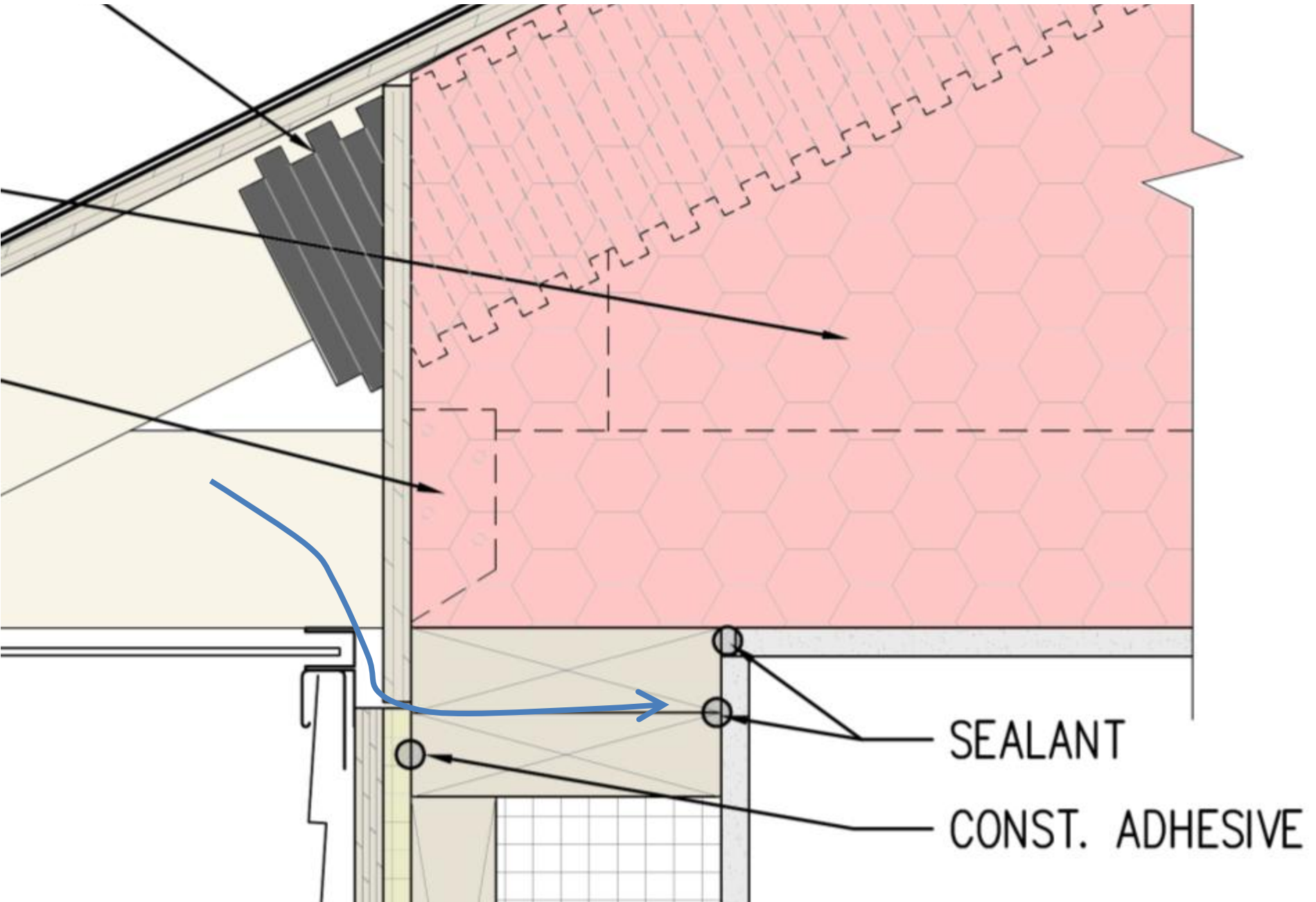
ZIP SHEATHING AT RIM JOIST



WALL/CEILING DETAIL



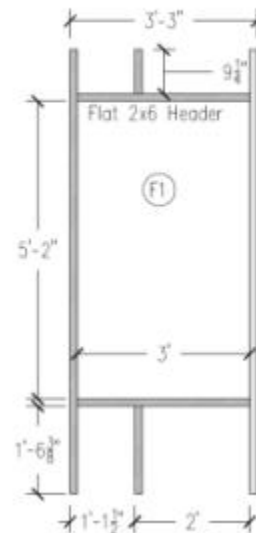
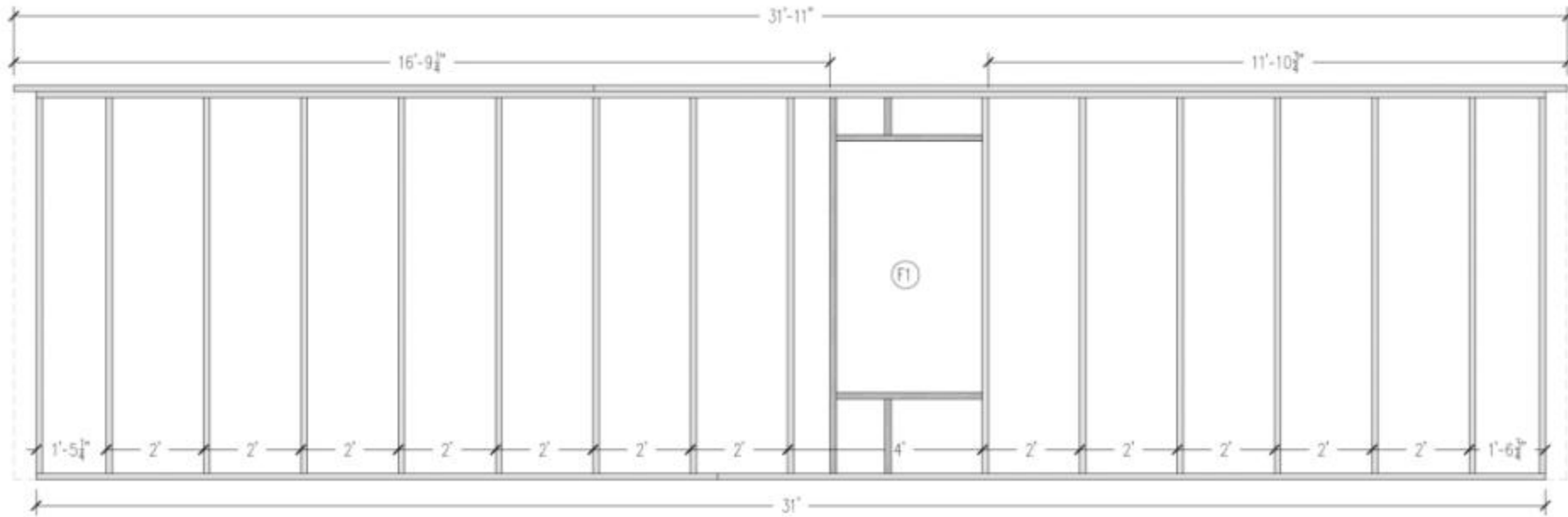
TOP PLATE DETAIL



WALL F

VIEW OF WALL FROM THE INTERIOR

Non 24 O.C. studs are darker.



WALL FRAMING PLAN

Non-Load Bearing Wall



GOOD BATT INSULATION

INSULATION BEHIND ELECTRICAL PANEL



BAD BATT INSULATION





Exterior Attic Access

BATH FAN AIR SEALING



HEATING, AIR- CONDITIONING, & VENTILATION

HEATING & COOLING PLAN

Mini-Split
Exterior Unit →

Mini-Split
Interior Unit →

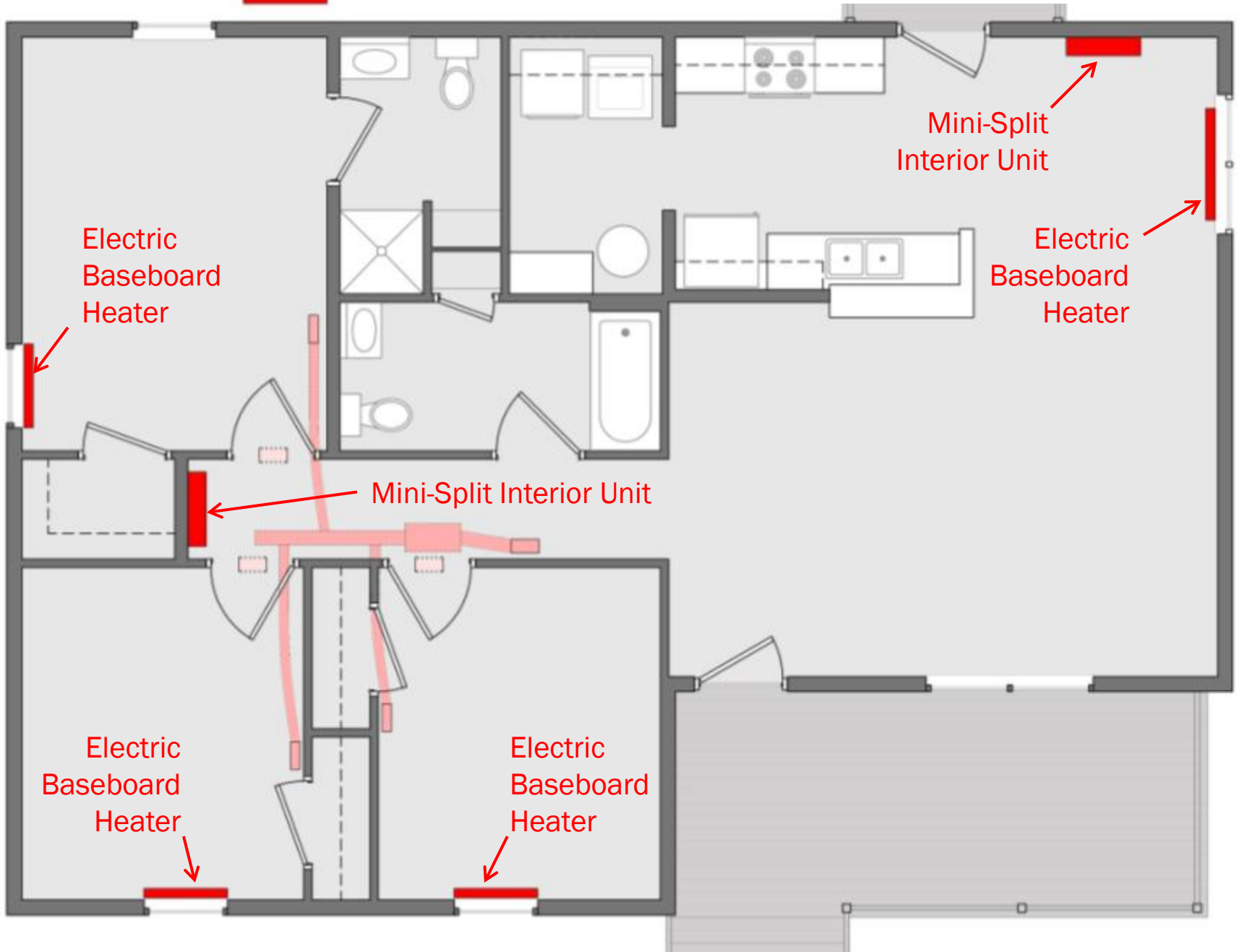
Electric
Baseboard
Heater →

Electric
Baseboard
Heater →

Mini-Split Interior Unit →

Electric
Baseboard
Heater →

Electric
Baseboard
Heater →



MINI-SPLIT HEAT
PUMP INTERIOR
UNIT



MINI-SPLIT HEAT
PUMP EXTERIOR
UNIT

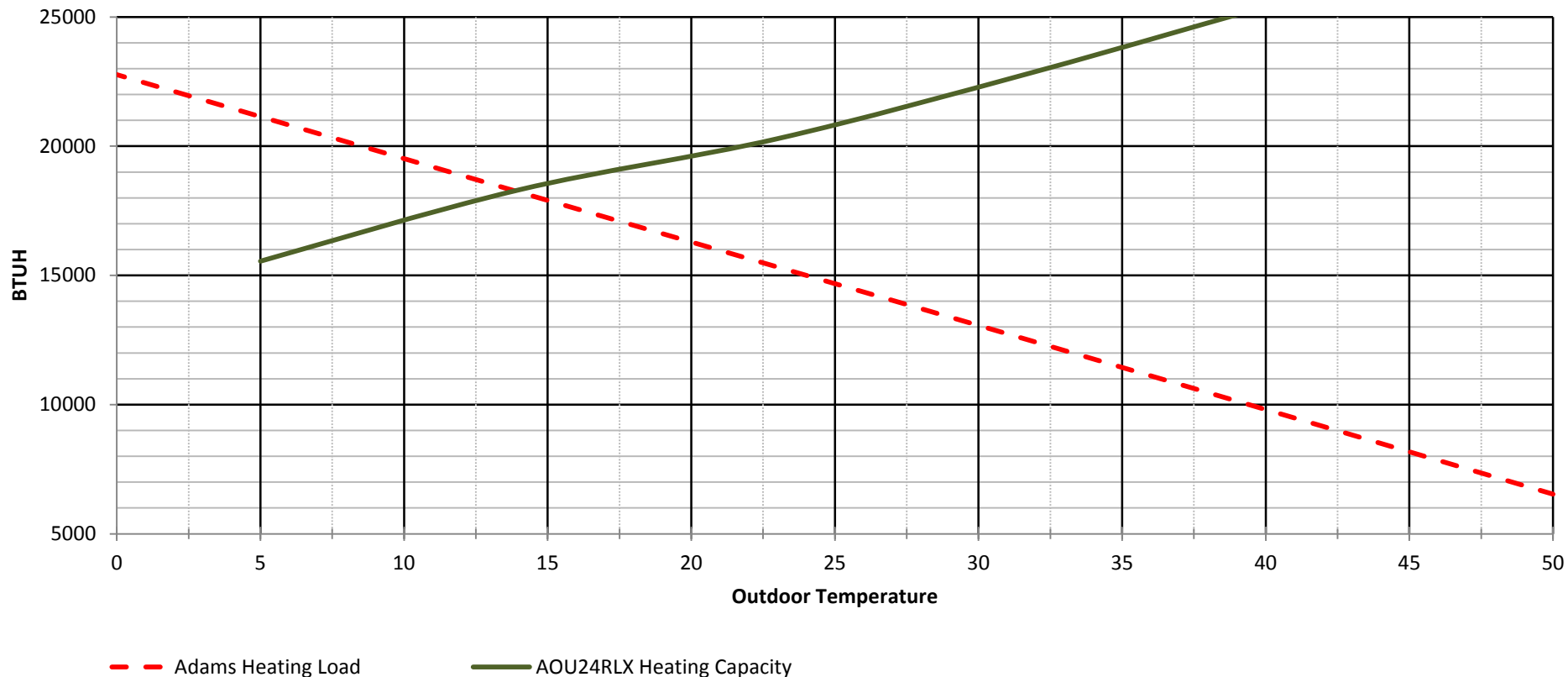


MINI-SPLIT HEAT PUMP PERFORMANCE

FUJITSU AOU24RLX:

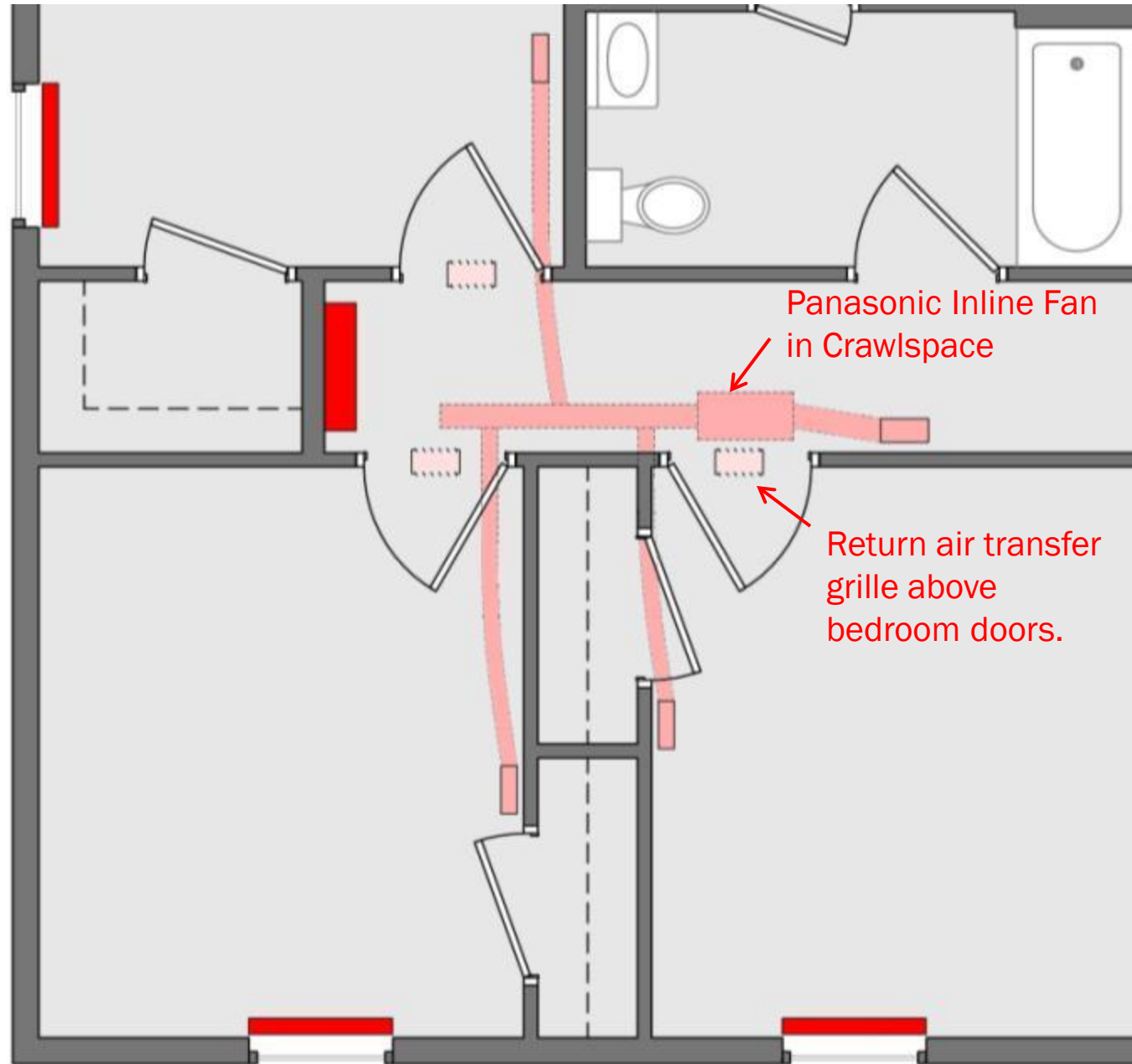
SEER = 18.0 HSPF = 9.5

Balance Point Diagram

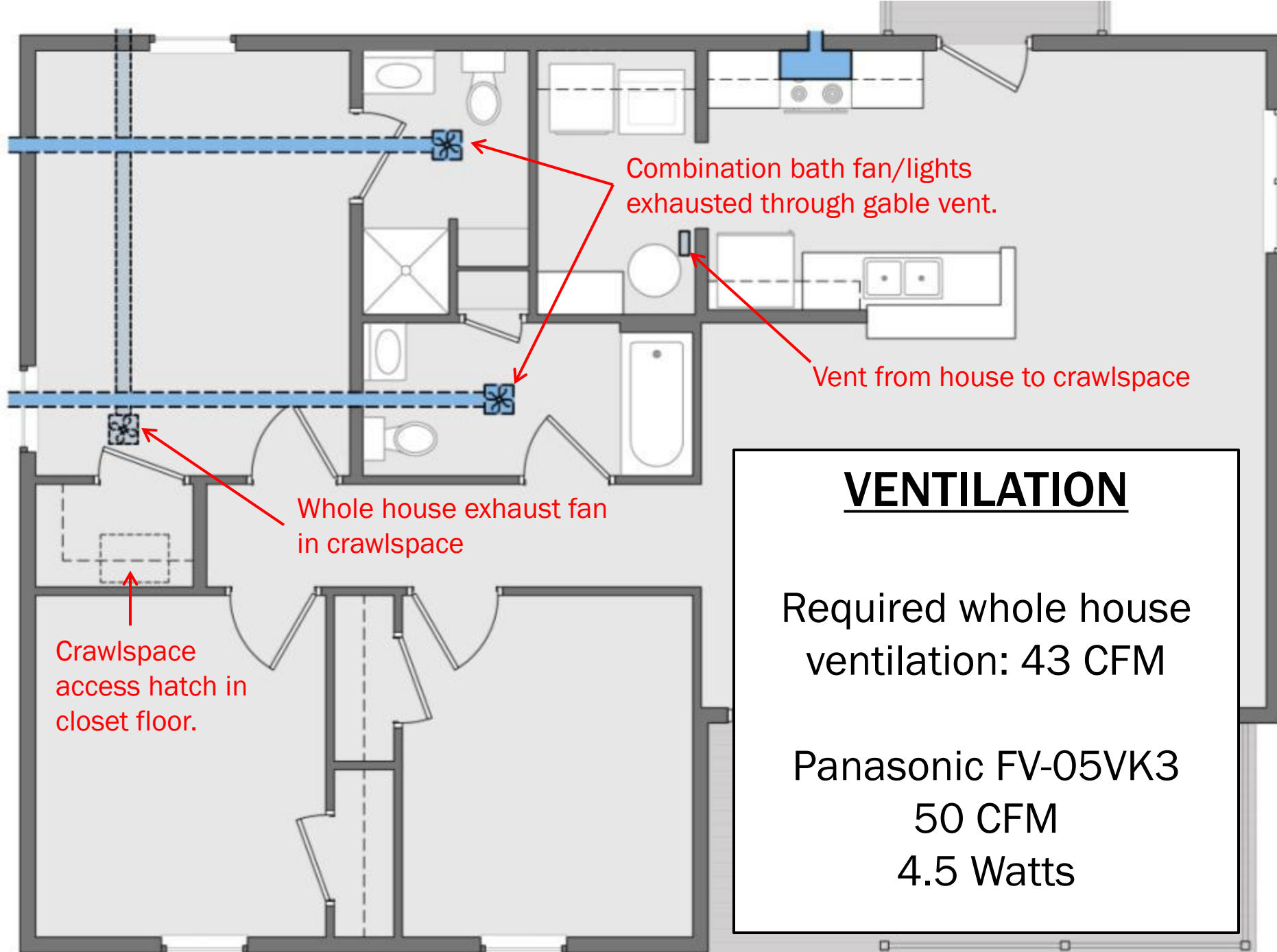


AIR DISTRIBUTION

Panasonic
FV-30NLF1
Inline Fan:
340 CFM
98 Watts



*Air transfer vent with
sound and light baffle*



VENTILATION

Required whole house
ventilation: 43 CFM

Panasonic FV-05VK3
50 CFM
4.5 Watts

WATER

Heat Pump Water Heater

Saves approximately \$200/yr.

Compact Plumbing Layout

Longest line about 12' (horizontally)

Low Flow Plumbing Fixtures

- 1.75 GPM Shower Heads
- 1.5 GPM Lavatories
- 1.3 GPF Toilets

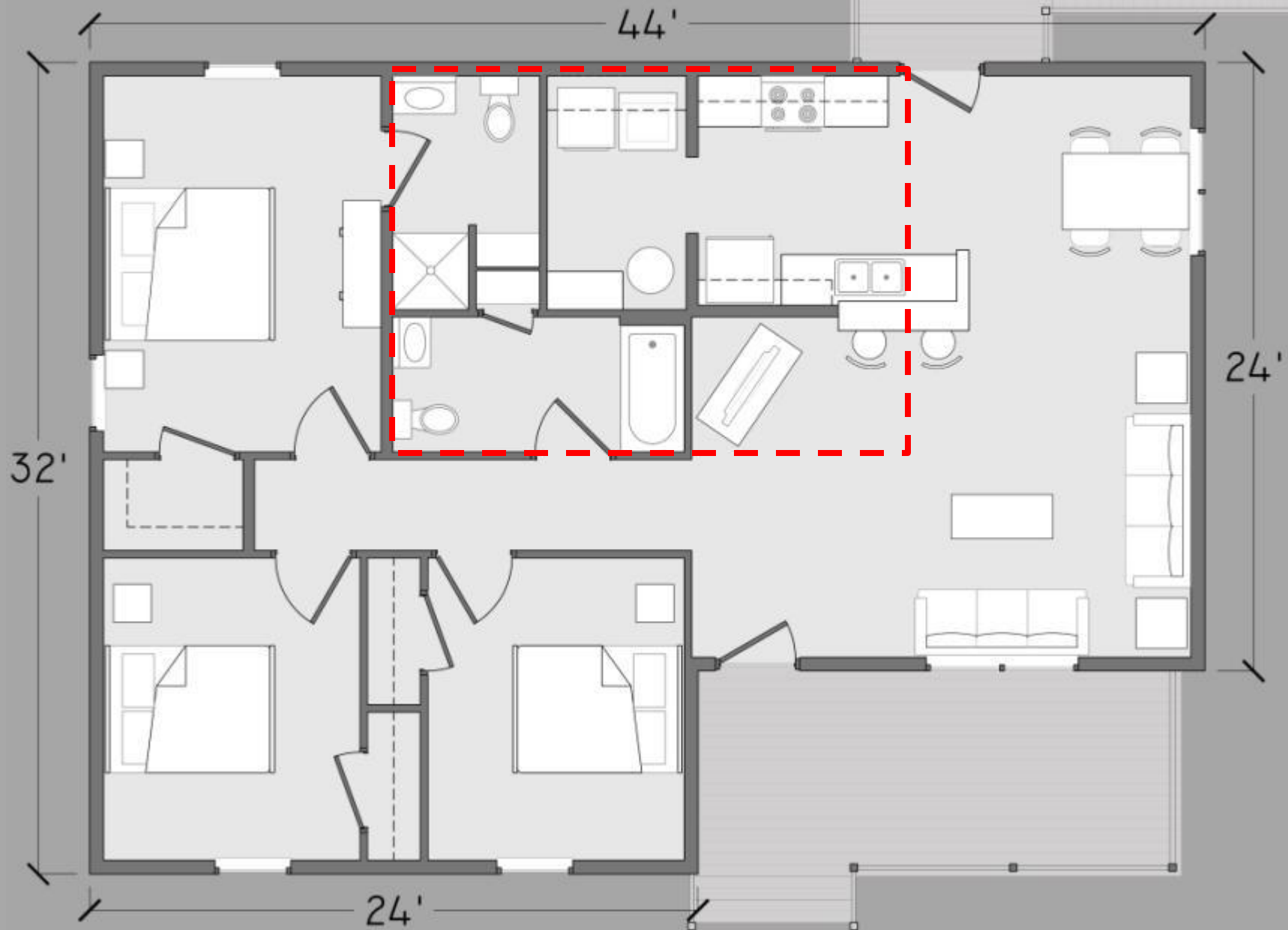
High Efficiency Top-Load Clothes Washer

Pipe Insulation

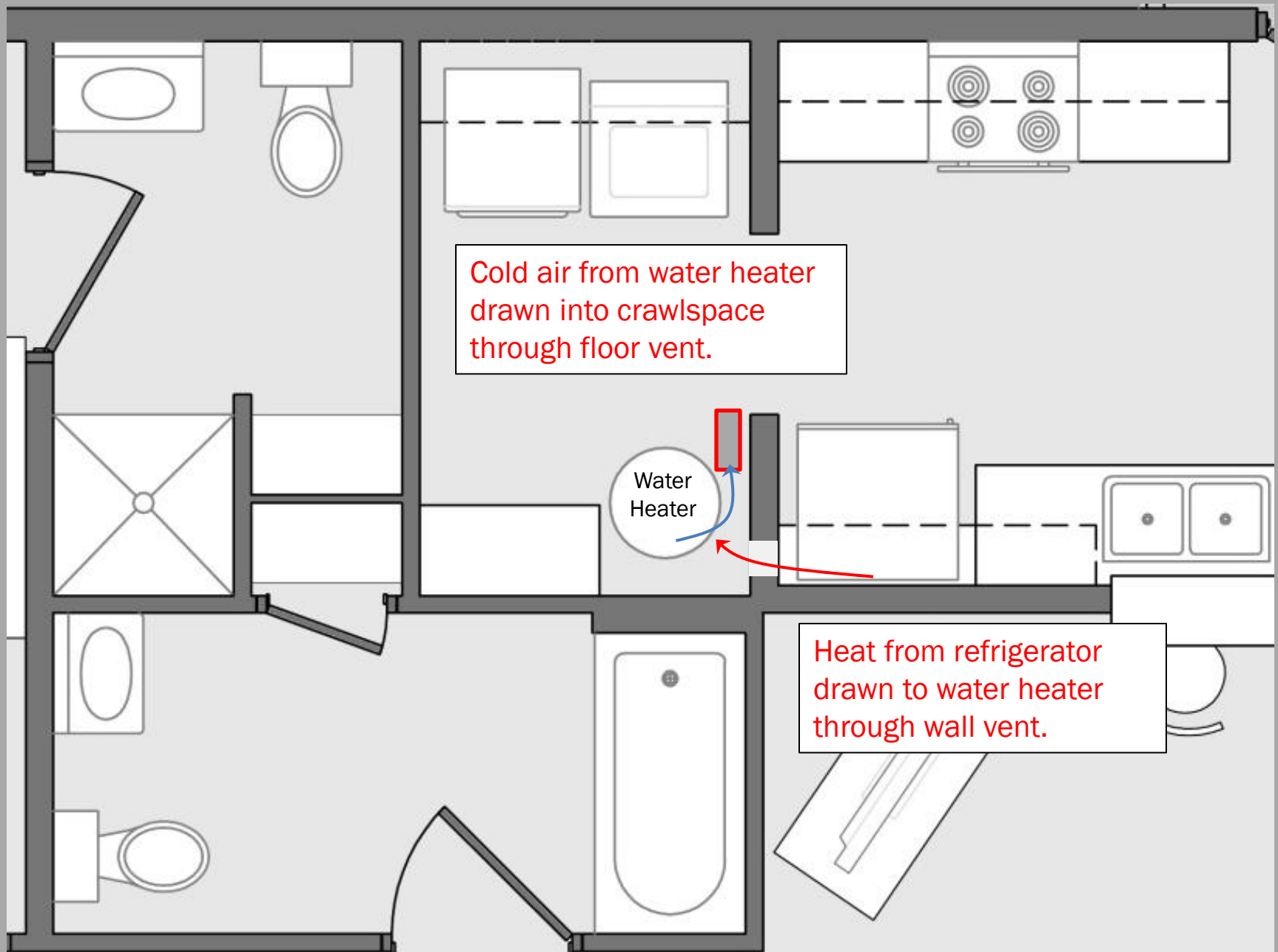
R-4 insulation on hot and cold water lines



COMPACT PLUMBING



WATER HEATER AIR FLOW



EQUIPMENT

CLOTHES WASHER

Energy Star - \$14 per year

REFRIGERATOR

Energy Star - \$44 per year

LIGHTING

All CFL bulbs

ENERGY PERFORMANCE

AIR LEAKAGE

468 CFM50

2.0 ACH50

HERS RATING

47

PREDICTED ANNUAL ENERGY COSTS

Heating	\$277
Cooling	\$52
Hot Water	\$109
Lights/Appliances	\$424

TOTAL \$862

COST

PSHH Labor	\$21,020
Materials	\$49,607
Subcontractors	\$17,824
Services	\$3,957
Overhead	\$16,911
Volunteer Labor	\$1,920
Theft	-\$1,234

TOTAL \$110,005

APPRAISAL

Base Appraisal	\$91,800
Energy Efficiency Credit*	\$4,200

TOTAL \$96,000

* Based on estimated an annual energy savings of \$700.
Estimated holding period of 7 years and interest rate of 4%

LOSS

Appraisal

\$96,000

Cost of Construction

\$110,005

\$14,005

COST/BENEFIT of CONSTRUCTION DETAILS

A Comparison of Adams House Features to a
Code-Minimum House (2006 IRC)

CRAWLSPACE COST COMPARISON

ADAMS CONDITIONED CRAWLSPACE

EPS Foam Board	\$100
CMU Parging	\$50
Form-a-Drain	\$430
Form-a-Drain Installation	\$220
Filter Fabric	\$50
Clean Gravel	\$350
Pipe Boots	\$30
Spray Foam, Vapor Barrier, Spary Ignition Barrier	\$1960
Footing Sealer	\$50
Dimpled Membrane & Fasteners	\$370
Labor	\$720
TOTAL:	\$4330

MIN. CONVENTIONAL CRAWLSPACE

R-19 Batt Insulation	\$700
Installation	\$290
TOTAL:	\$990

**ADDITIONAL COST FOR
ADAMS CRAWLSPACE:
\$3340**

BENEFITS OF CONDITIONED CRAWLSPACE

MOISTURE CONTROL

Conditioned crawlspaces are typically much dryer than a conventional vented crawlspaces.

Improved Air Quality – No moisture, no mold

Improved Durability – No moisture, no rot

Pest Control – Pests such as termites and roaches prefer damp environments.

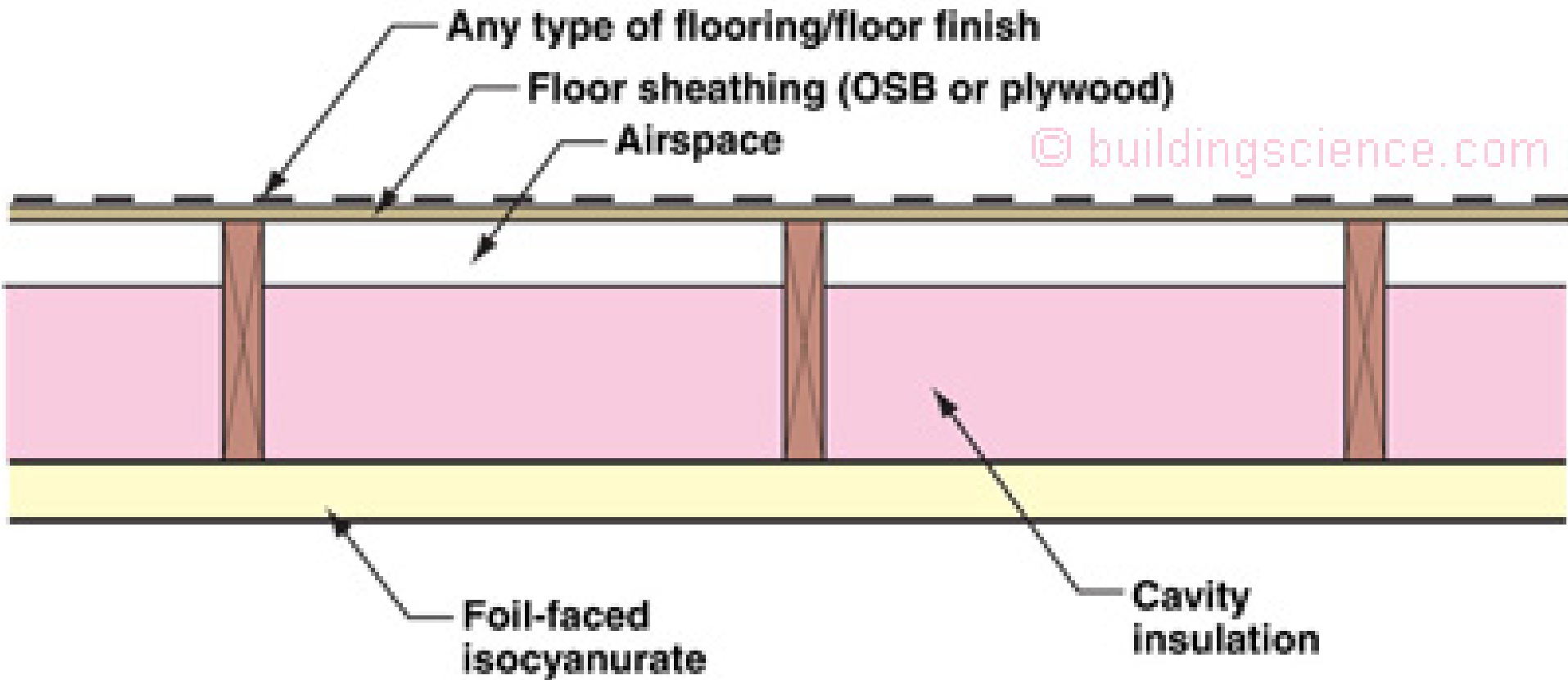
BENEFITS OF CONDITIONED CRAWLSPACE, cont.

More Comfortable – Warmer floors

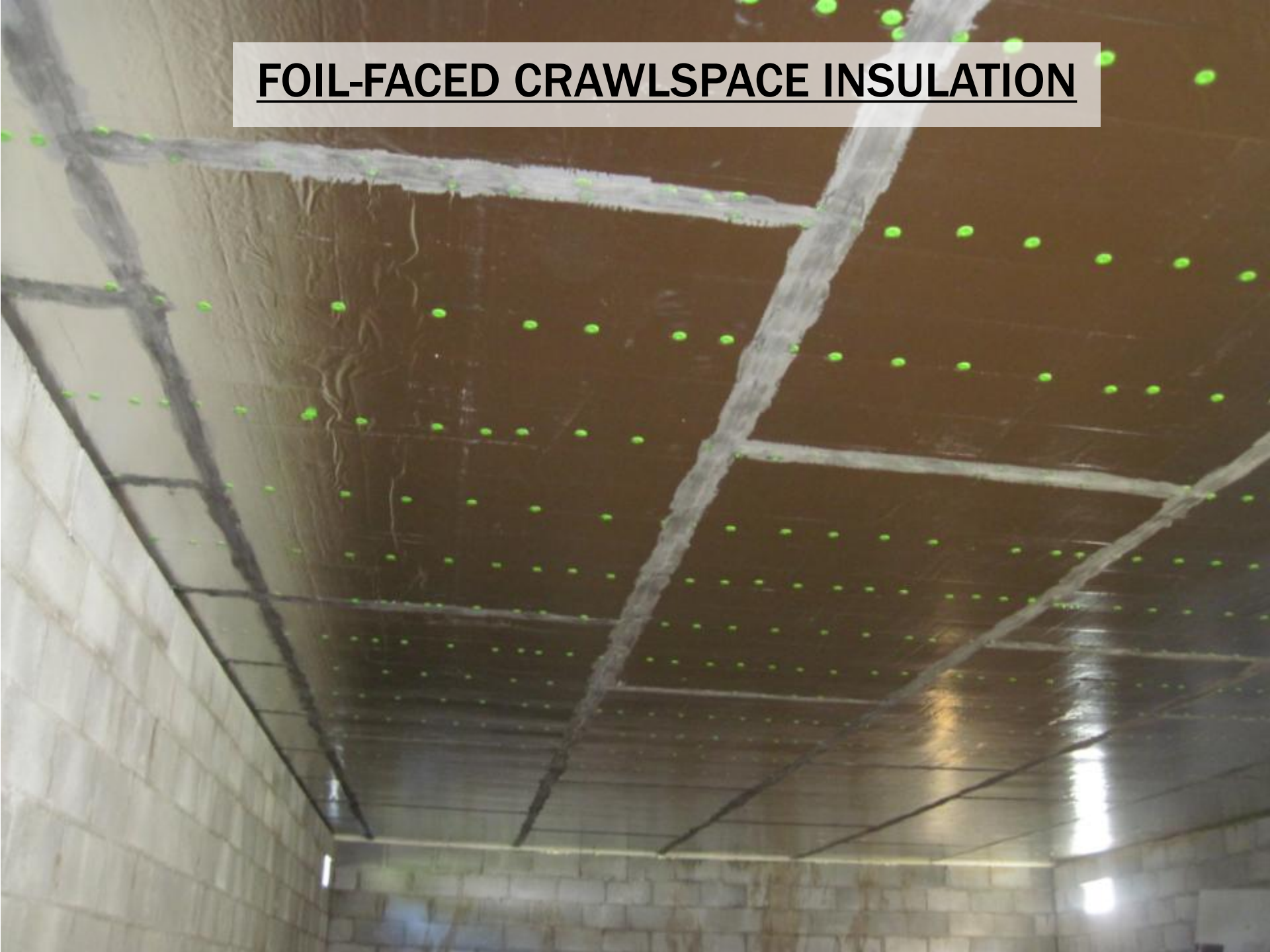
Energy Savings:

FACTORS AFFECTING ENERGY SAVINGS		ANNUAL ENERGY SAVINGS
DUCT LOCATION	QUALITY OF BATT INSULATION INSTALLATION IN CONVENTIONAL CRAWLSPACE	
Ducts in Crawlspace	Poor	\$100
Ducts in Crawlspace	Decent	\$60
No ducts (minisplits) or ducts in conditioned space (dropped ceiling)	Poor	\$0
No ducts (minisplits) or ducts in conditioned space (dropped ceiling)	Decent	-\$40

CONDITIONED CRAWLSPACE ALTERNATIVE



FOIL-FACED CRAWLSPACE INSULATION



ADDITIONAL AIR SEALING COST*

*Improve from 5.0 ACH50 to 2.0 ACH50

ADAMS AIR SEALING COST

Additional Caulk	\$50
Additional Const. Adhesive	\$20
Backer Rod	\$10
Drywall Gasket	\$90
Spray foam Cans	\$20
Additional Labor	\$550
Ventilation Fan – Materials and Labor	\$180

**ADDITIONAL COST FOR
ADAMS CRAWLSPACE:
\$920**

BENEFITS OF AIR SEALING

Energy Savings – \$80/yr savings.

Improved Comfort

Improved Durability – Better moisture control.

Improved Air Quality – Reduces dust and allergens.

2x6 FRAMING

Cost

- Close to \$0
- Slightly less floor space.

Benefits

- **\$50/yr** energy savings
- Improved comfort

Drawback – Increased risk of condensation in walls.

WALL SHEATHING COST COMPARISON

ZIP SHEATHING	
4" Zip Tape	\$380
6" Zip Tape	\$30
Zip Sheathing	\$810
Rubber Membrane	\$80
Zip Tape Labor	\$150
TOTAL:	\$1450

OSB + HOUSEWRAP	
OSB	\$350
Housewrap	\$140
Housewrap Tape	\$30
Housewrap Labor	\$430
TOTAL:	\$950



**ADDITIONAL COST FOR
ZIP SHEATHING:
\$500**



BENEFITS OF ZIP SHEATHING OVER OSB+HOUSEWRAP

Energy Savings – Versus untaped, unsealed OSB, taped ZIP Sheathing is more airtight. **\$35/yr savings.**

Improved Durability – Zip weather barrier is less prone to damage and installation error than housewrap. Better weather barrier keeps rain out of walls. Taped seams keep moist air out of walls.

Improved Comfort – Airtight homes are more comfortable.

R50 Ceiling Insulation

Cost vs R38 - \$210

Benefits

- **\$15/yr** energy savings
- Improved comfort

ADDITIONAL COST OF ZIP-R SHEATHING



**ADDITIONAL COST FOR
ZIP-R SHEATHING*:
\$700**

* versus standard Zip sheathing

HVAC COST COMPARISON

DUCTLESS 18 SEER MINI-SPLIT

Mini-Split Materials & Install	\$5000
1 Baseboard Supplemental Heater – Materials & Install	\$110
Mini-Split Thermostats	\$320
TOTAL:	\$5430

DUCTED 14 SEER HEAT PUMP

14 SEER Heat Pump with Ducts – Materials & Install	\$4950
TOTAL:	\$4950

**ADDITIONAL COST FOR
MINI-SPLIT:
\$480**

MINI-SPLIT HEAT PUMP

BENEFITS

Energy Savings – \$90/yr

Improved Moisture Control – Variable speed heat pump cannot be oversized for cooling. Better dehumidification during summer.

DRAWBACK

Air Distribution - Minor temperature variations in open rooms. Bedrooms with closed doors 6 ° cooler typically, 10° degrees cooler worst case.

AIR DISTRIBUTION SYSTEM FOR MINI-SPLIT

AIR DISTRIBUTION SYSTEM	
Baseboard Heaters in Bedrooms	\$270
Air Distribution Fan with Small Ducts, Materials and Install	\$630
TOTAL:	\$900

Very similar air distribution to fully ducted traditional heat pump with the performance of a mini-split.

HEATING & COOLING PLAN

Mini-Split
Exterior Unit →

Mini-Split
Interior Unit

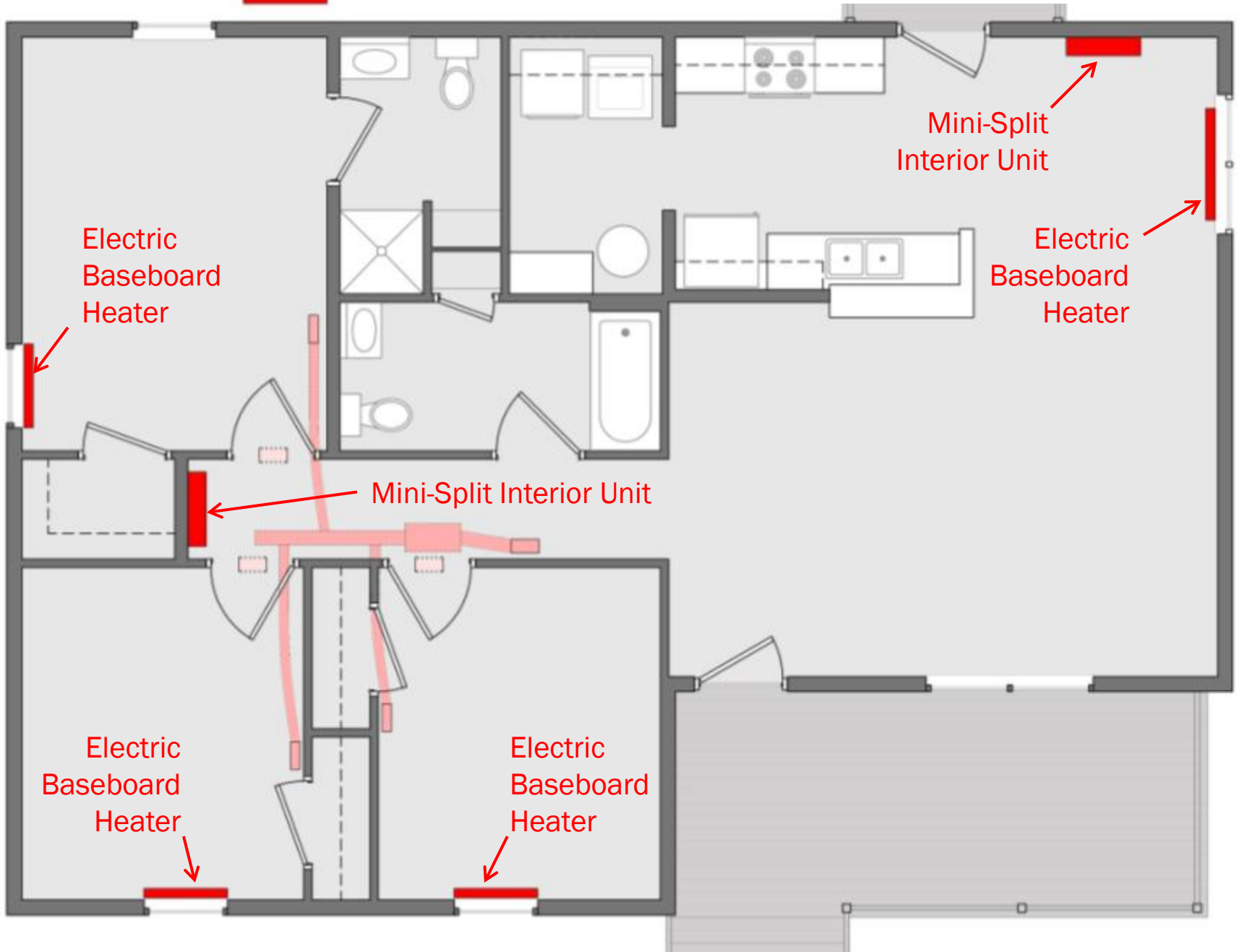
Electric
Baseboard
Heater

Electric
Baseboard
Heater

Mini-Split Interior Unit

Electric
Baseboard
Heater

Electric
Baseboard
Heater



HEAT PUMP WATER HEATER

Cost - \$950

Energy Savings - \$190/yr

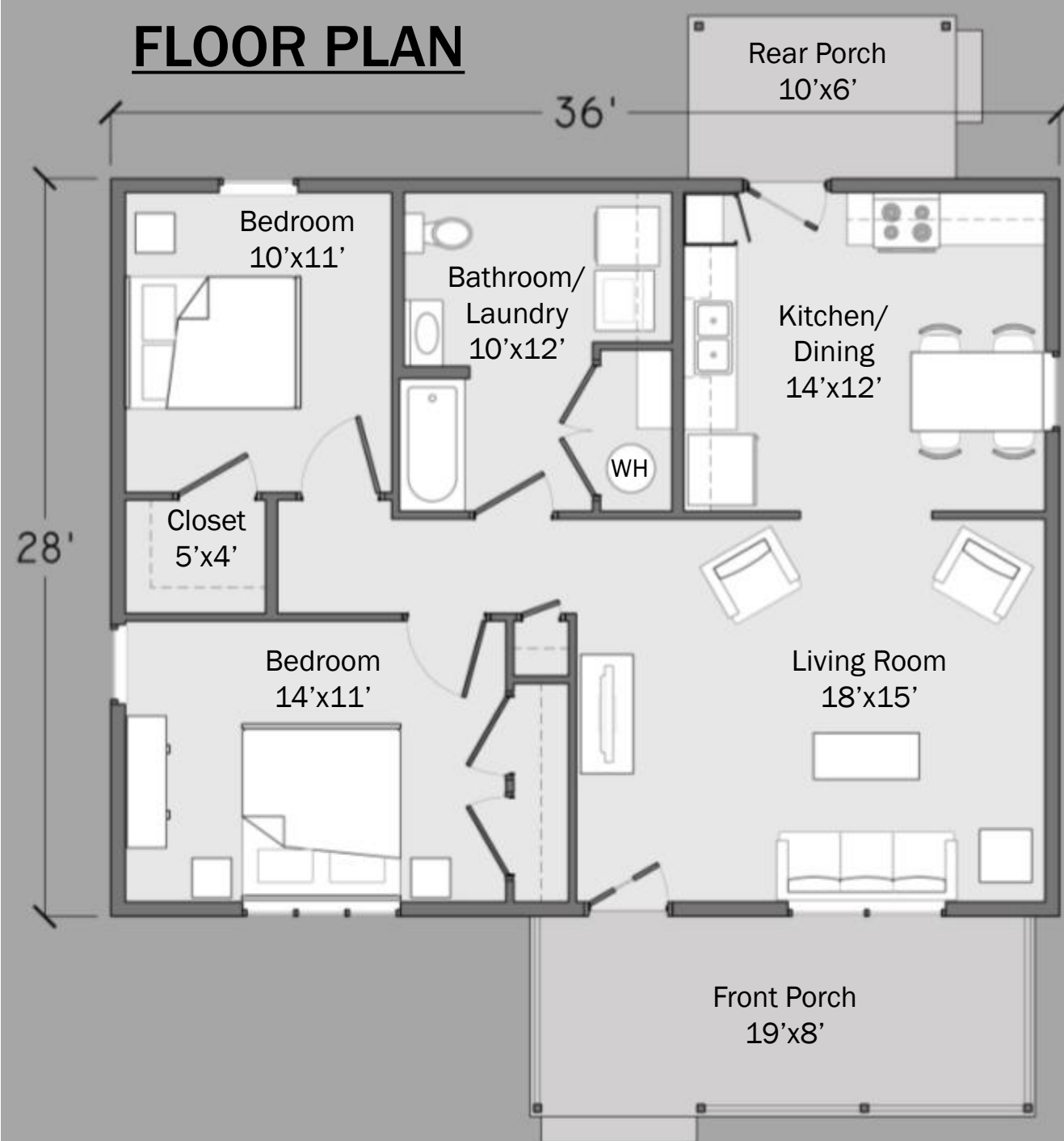


SHUMATE HOUSE

2 Bedroom / 1 Bath
1008 SF



FLOOR PLAN



COMPACT DIMENSIONS

Less surface area for exterior walls means less energy loss.

SIMPLE PLAN

Less expensive to build and easier to air seal.

COMPACT PLUMBING

UNIVERSAL DESIGN

- 42" Hallway
- 36" Doors
- Space to maneuver
- Large Bathroom/Laundry
- Blocking for grab bars
- Lever handles
- Accessible switches

LARGE PORCH

Cost effectively makes the home feel more spacious and adds curb appeal.

BUILDING ENVELOPE

FOUNDATION

- Concrete Slab
- 8" Concrete masonry walls
- R-14.7 EPS foam board insulation

Same as Adams House

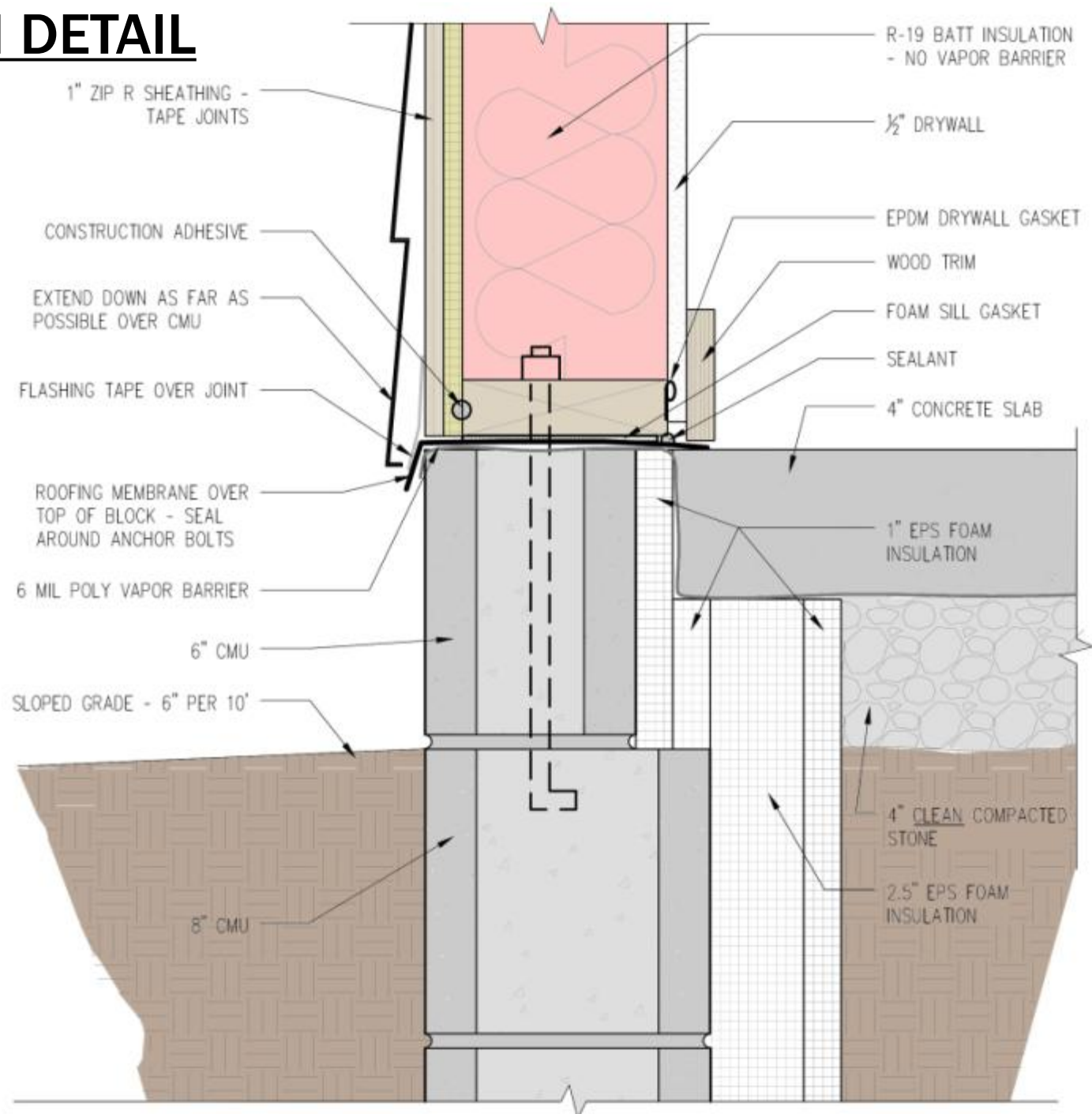
WALLS

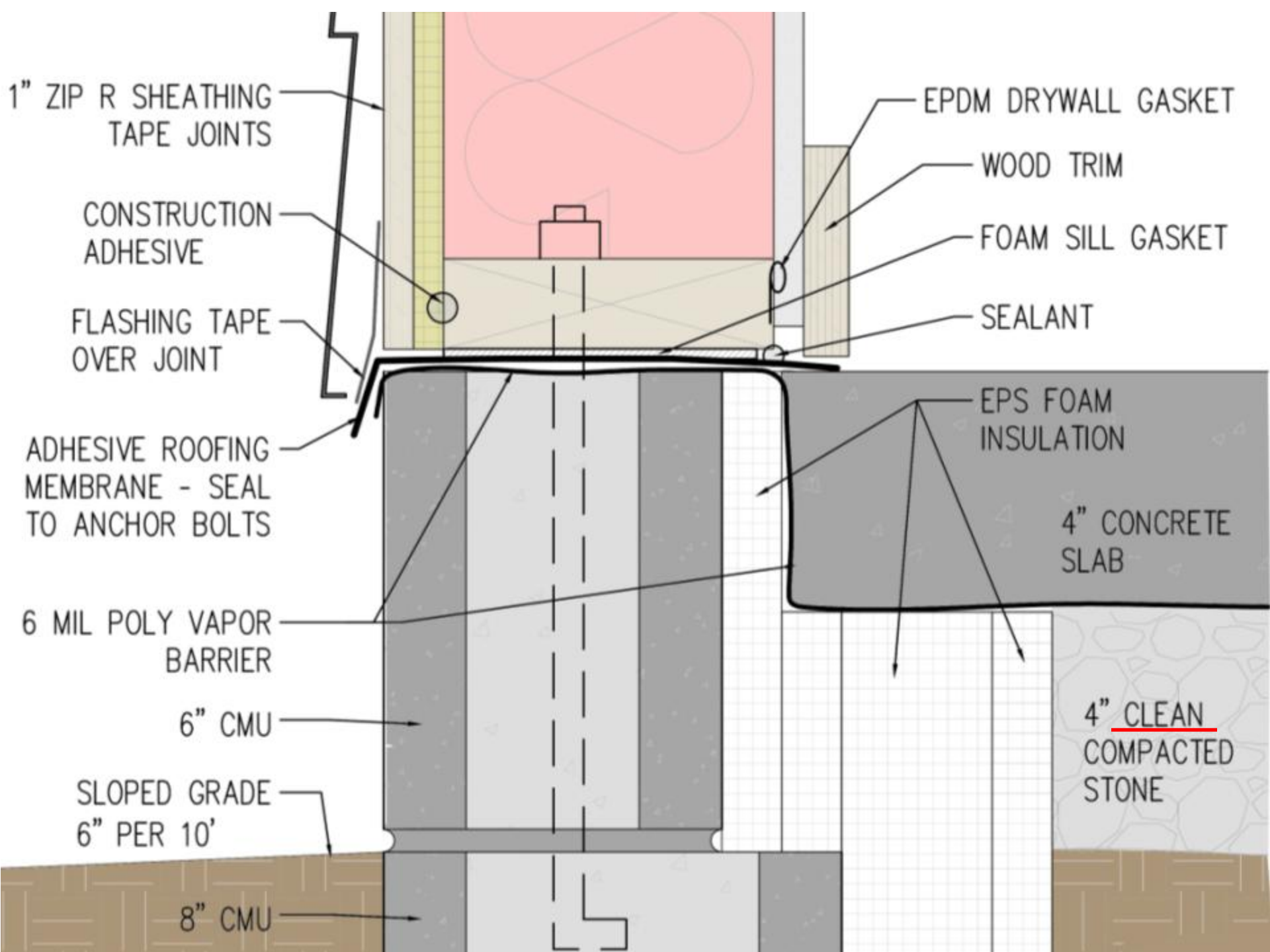
- 2x6 Advanced framing with Zip-R sheathing
- R-19 Fiberglass batt insulation in wall cavities
- R-3.6 Continuous insulation attached to wall sheathing

CEILING

- Raised heel/energy trusses
- R-50 blown-in cellulose insulation

FOUNDATION DETAIL





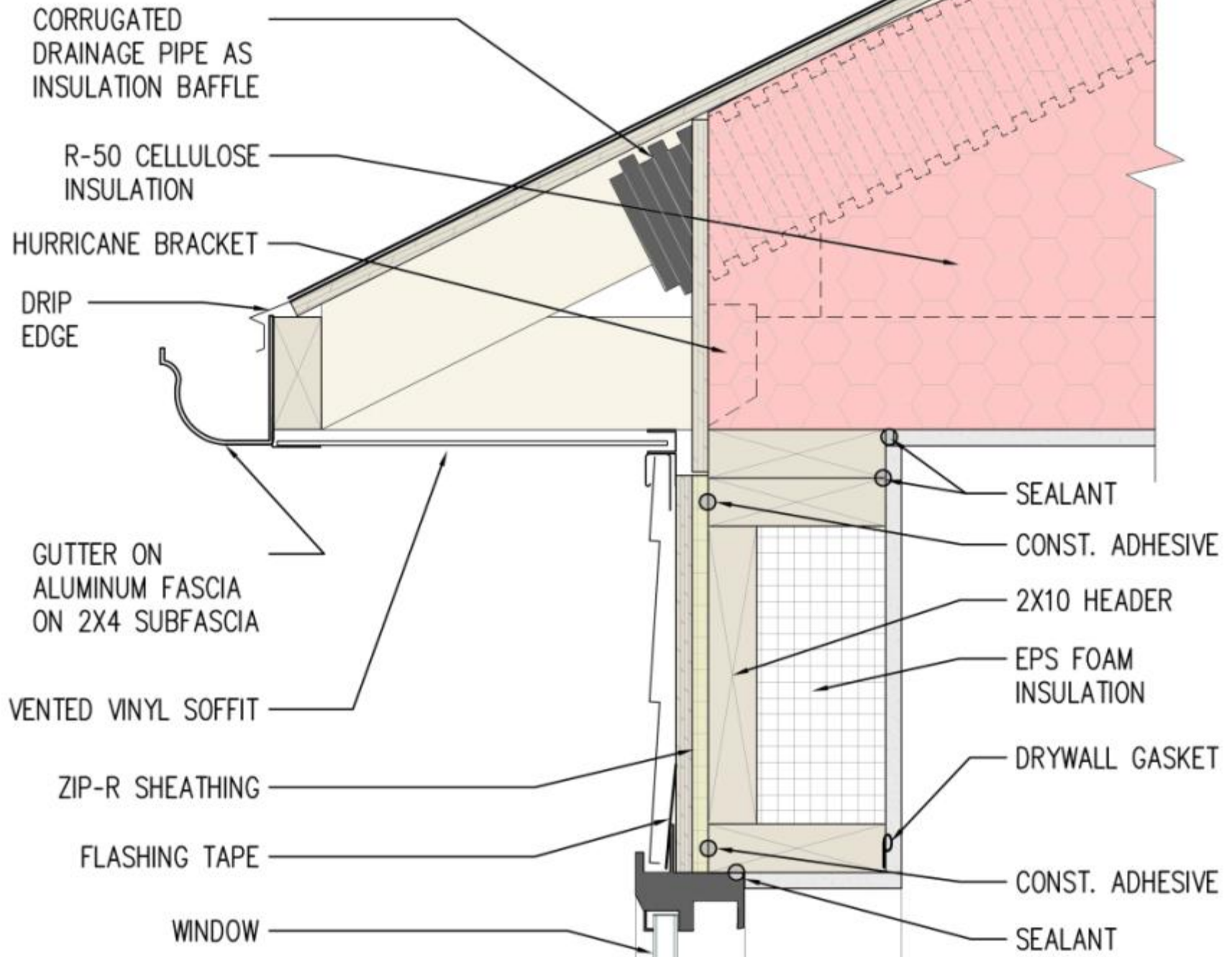


SLAB FOUNDATION INSULATION



DOWN SPOUT – 5' FROM FOUNDATION

WALL/CEILING DETAIL



HEATING, AIR- CONDITIONING, & VENTILATION

HEATING & COOLING PLAN

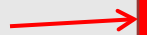
Mini-Split
Exterior Unit



Electric
Baseboard
Heater



Electric
Baseboard
Heater



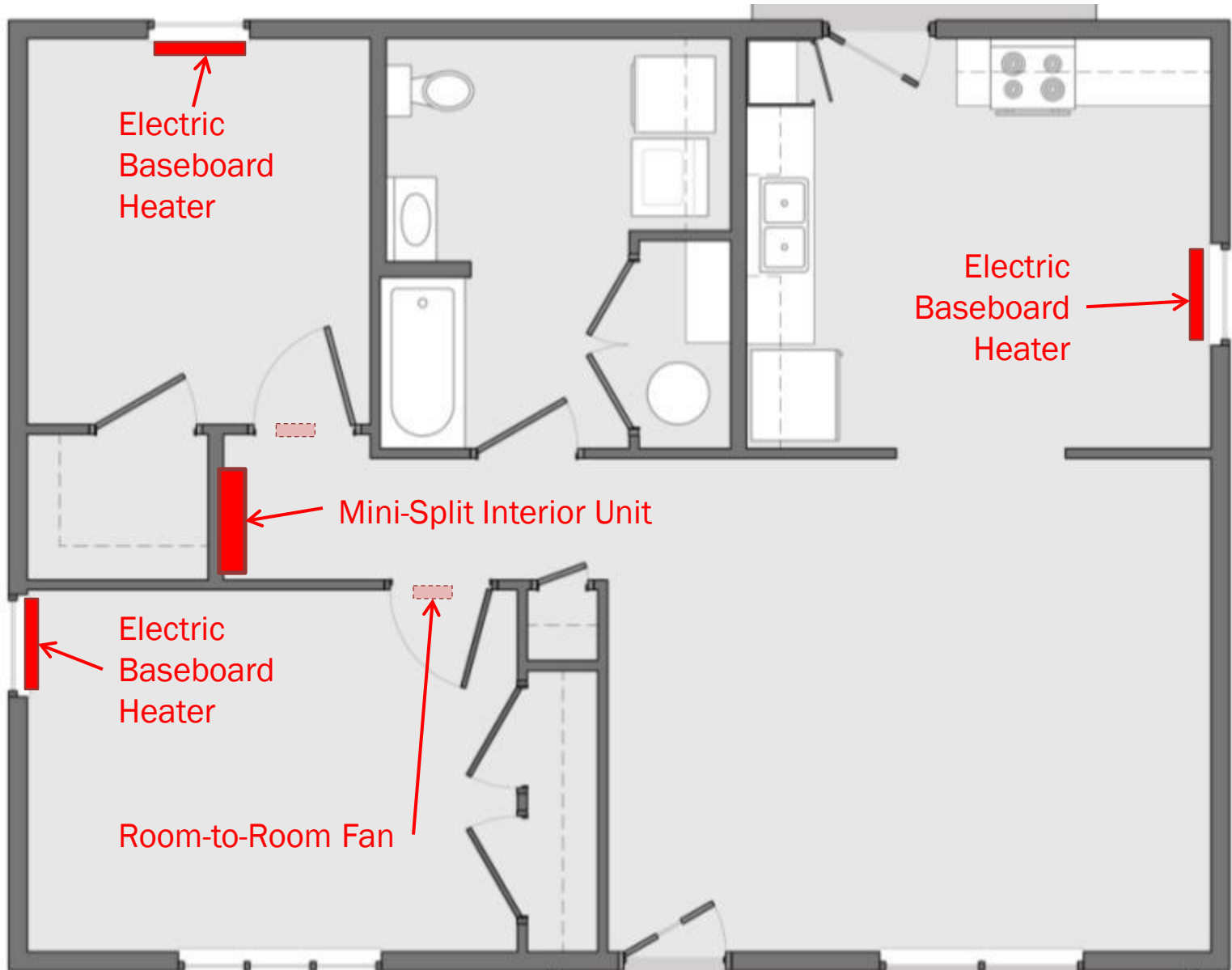
Mini-Split Interior Unit



Electric
Baseboard
Heater



Room-to-Room Fan

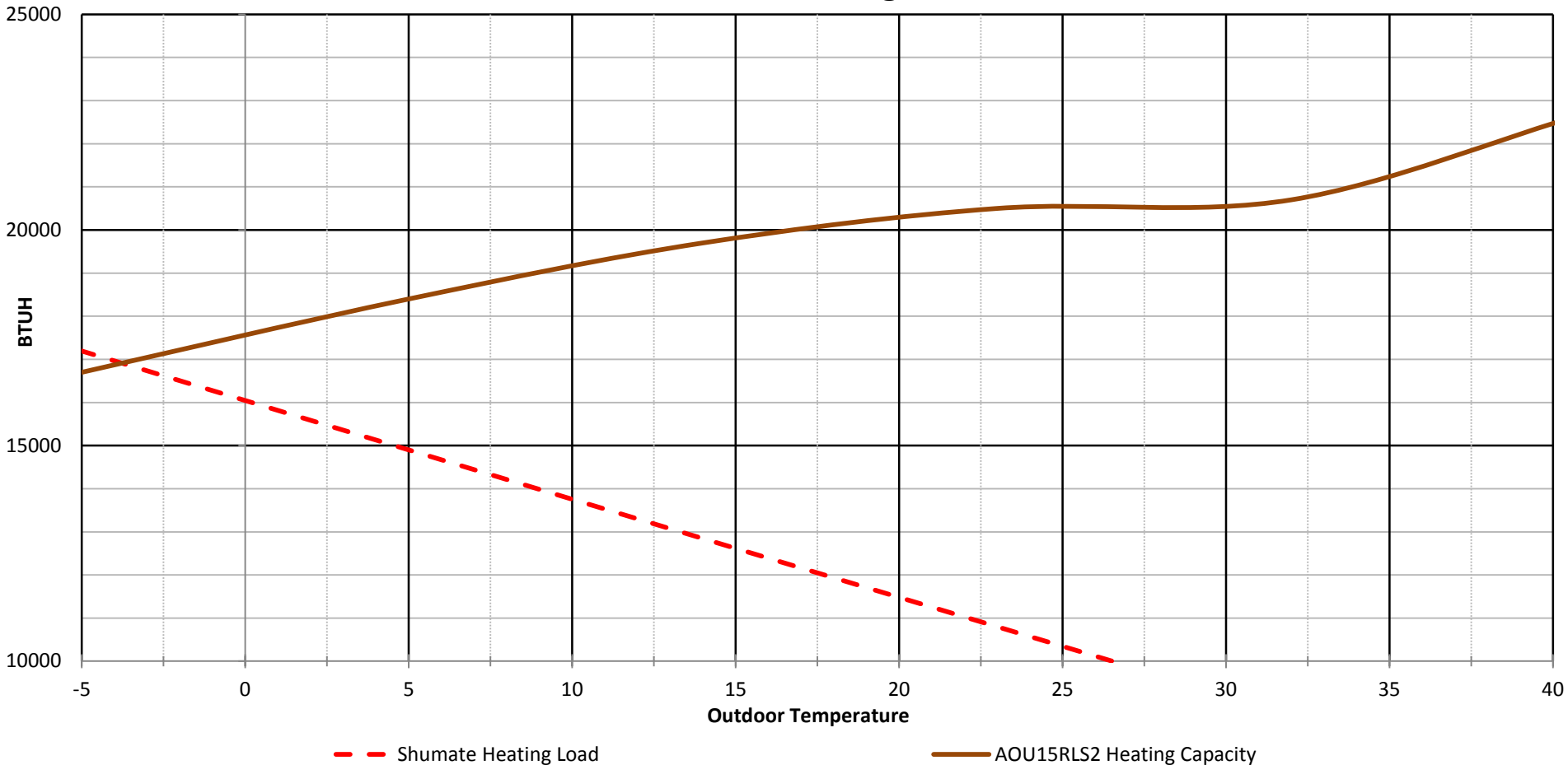


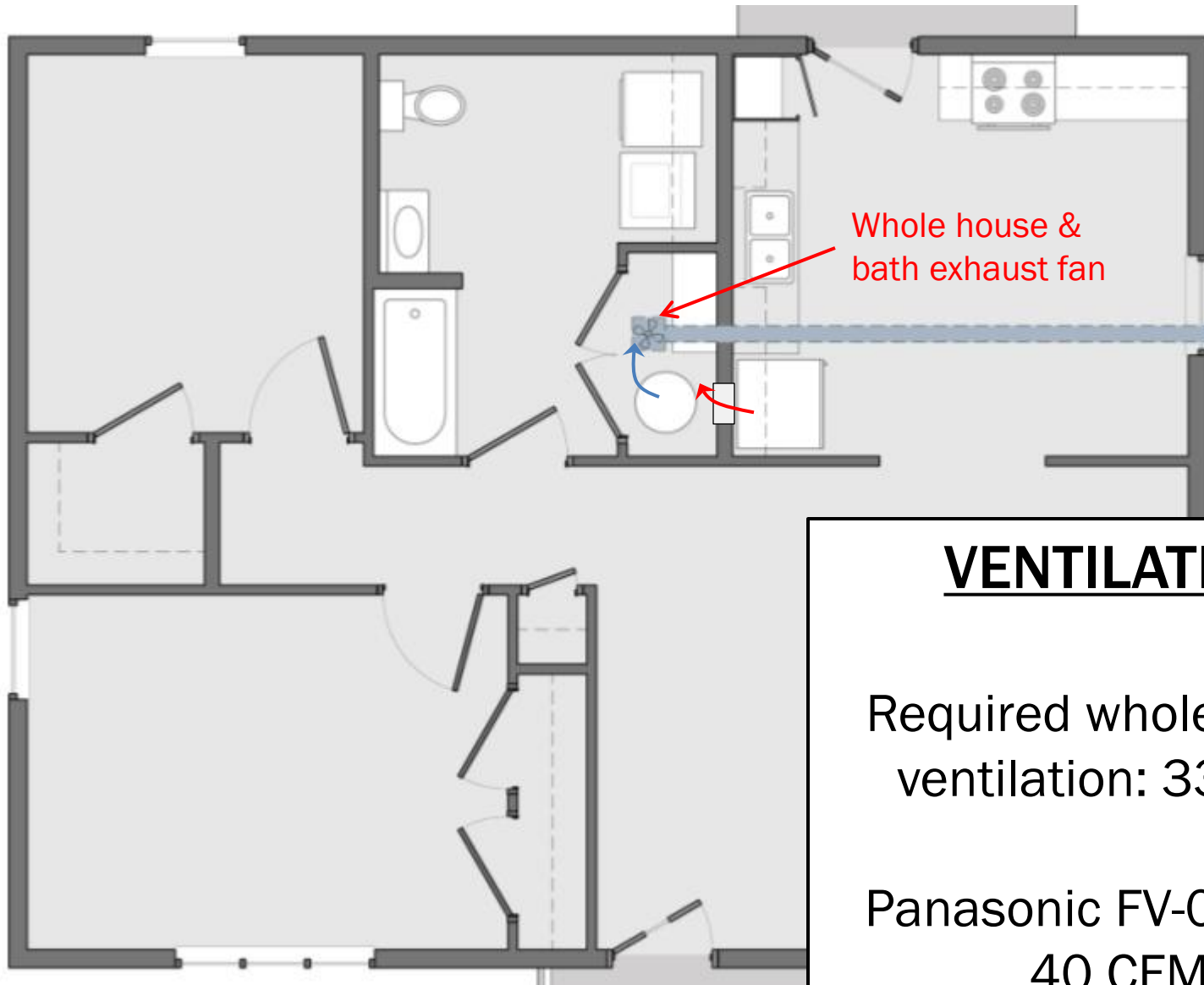
MINI-SPLIT HEAT PUMP PERFORMANCE

FUJITSU AOU15RLS2:

SEER = 21.5 HSPF = 12.0

Balance Point Diagram





VENTILATION

Required whole house
ventilation: 33 CFM

Panasonic FV-08VKS3
40 CFM
4.3 Watts

WATER

Heat Pump Water Heater

Saves approximately \$200/yr.

Compact Plumbing Layout

Longest line about 12' (horizontally)

Low Flow Plumbing Fixtures

- 1.75 GPM Shower Heads
- 1.5 GPM Lavatories
- 1.3 GPF Toilets

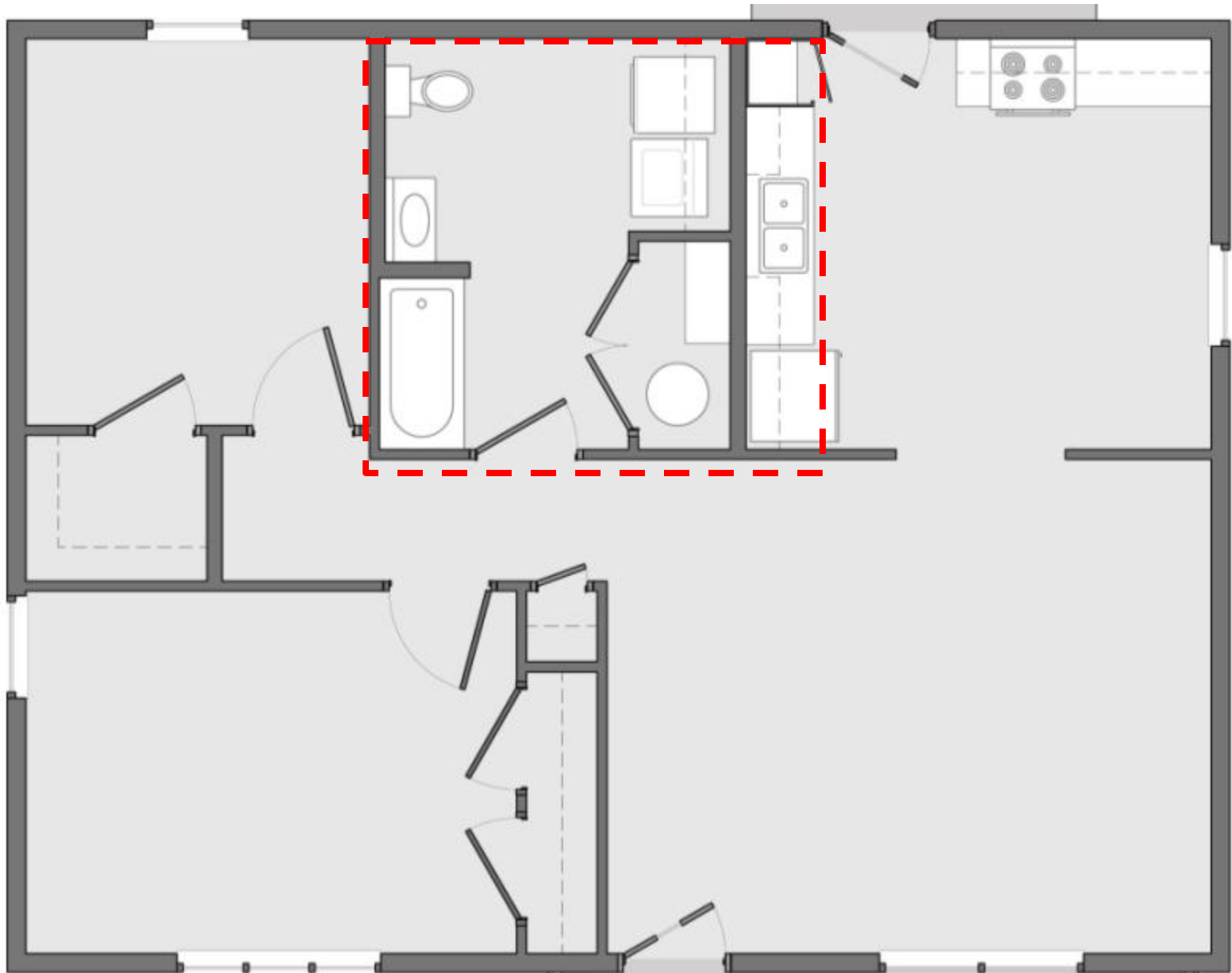
High Efficiency Top-Load Clothes Washer

Pipe Insulation

R-4 insulation on hot and cold water lines



COMPACT PLUMBING



EQUIPMENT

CLOTHES WASHER

Energy Star - \$14 per year

REFRIGERATOR

Energy Star - \$44 per year

LIGHTING

All CFL bulbs

SOLAR POWER



ENERGY PERFORMANCE

AIR LEAKAGE

262 CFM50

1.9 ACH50

HERS RATING

30

PREDICTED ANNUAL ENERGY COSTS

Heating	\$165
Cooling	\$39
Hot Water	\$95
Lights/Appliances	\$370
Solar PV	-\$224

TOTAL \$445

ENERGY PERFORMANCE

without PV System

AIR LEAKAGE

262 CFM50

1.9 ACH50

HERS RATING

46

PREDICTED ANNUAL ENERGY COSTS

Heating	\$165
Cooling	\$39
Hot Water	\$95
Lights/Appliances	\$370
TOTAL	\$669

COST

PSHH Labor	\$20,700
Materials	\$41,069
Subcontractors	\$11,115
Services	\$4,500
Overhead	\$14,161
Volunteer Labor	\$635

TOTAL \$92,180*

* Does not include PV system or lot costs.

APPRAISAL

Base Appraisal	\$81,820
Energy Efficiency Credit*	\$4,840

TOTAL \$86,660

* Based on estimated an annual energy savings of \$806.
Estimated holding period of 7 years and interest rate of 4%.
Does not include PV system.

LOSS

Appraisal

\$86,660

Cost of Construction

\$92,180

\$5,520

COST/BENEFIT of CONSTRUCTION DETAILS

A Comparison of Adams House Features to a
Code-Minimum House (2006 IRC)

HVAC COST COMPARISON

DUCTLESS 18 SEER MINI-SPLIT

Mini-Split Materials & Install	\$3700
1 Baseboard Supplemental Heater – Materials & Install	\$110
Mini-Split Thermostats	\$160
TOTAL:	\$3970

DUCTED 14 SEER HEAT PUMP

14 SEER Heat Pump with Ducts – Materials & Install	\$4950
TOTAL:	\$4500

**ADDITIONAL COST FOR
MINI-SPLIT:**

-\$530

MINI-SPLIT HEAT PUMP

BENEFITS

Improved Moisture Control – Variable speed heat pump cannot be oversized for cooling. Better dehumidification during summer.

No Ducts– In a slab house ducts would have to be in the attic (poor efficiency) or in a dropped ceiling (costly)

Energy Savings – **\$70/yr** (vs. ducts in cond. Space) **\$99/yr** (vs. ducts in attic)

DRAWBACK

Air Distribution - Minor temperature variations in open rooms. Bedrooms with closed doors 6 ° cooler typically, 10° degrees cooler worst case.

AIR DISTRIBUTION SYSTEM FOR MINI-SPLIT

AIR DISTRIBUTION SYSTEM	
Baseboard Heaters in Bedrooms	\$200
Room-to-Room Fans, Materials and Install*	\$400
TOTAL:	\$600

*Tjerlund AS1 fan: 60 CFM, 20 Watts (3 CFM/Watt)

Alternative – BROAN 510: 180 CFM, 100 Watts (1.8 CFM/Watt), half the cost.

HEATING & COOLING PLAN

Mini-Split
Exterior Unit



Electric
Baseboard
Heater



Electric
Baseboard
Heater



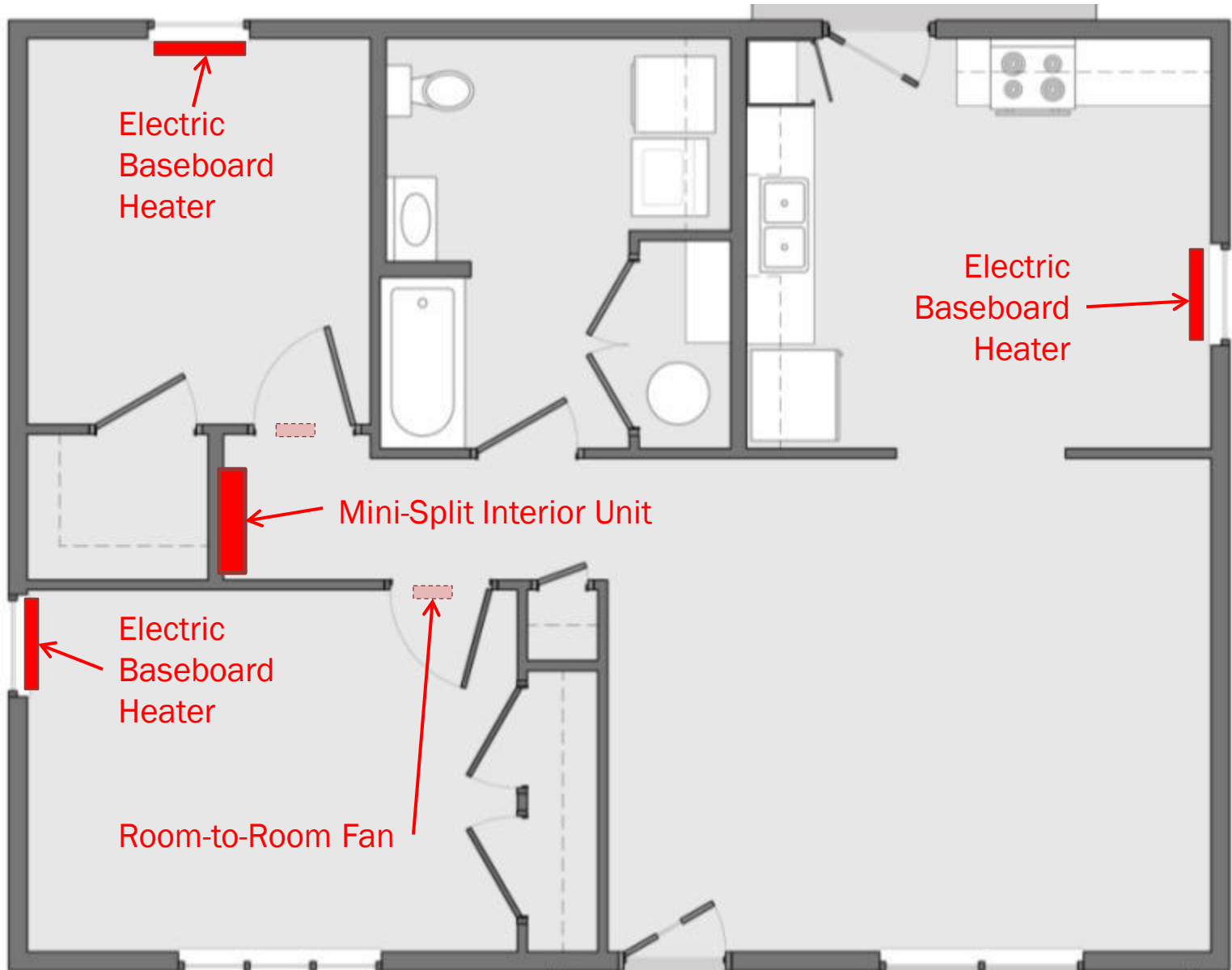
Mini-Split Interior Unit



Electric
Baseboard
Heater



Room-to-Room Fan



PV SOLAR SYSTEM

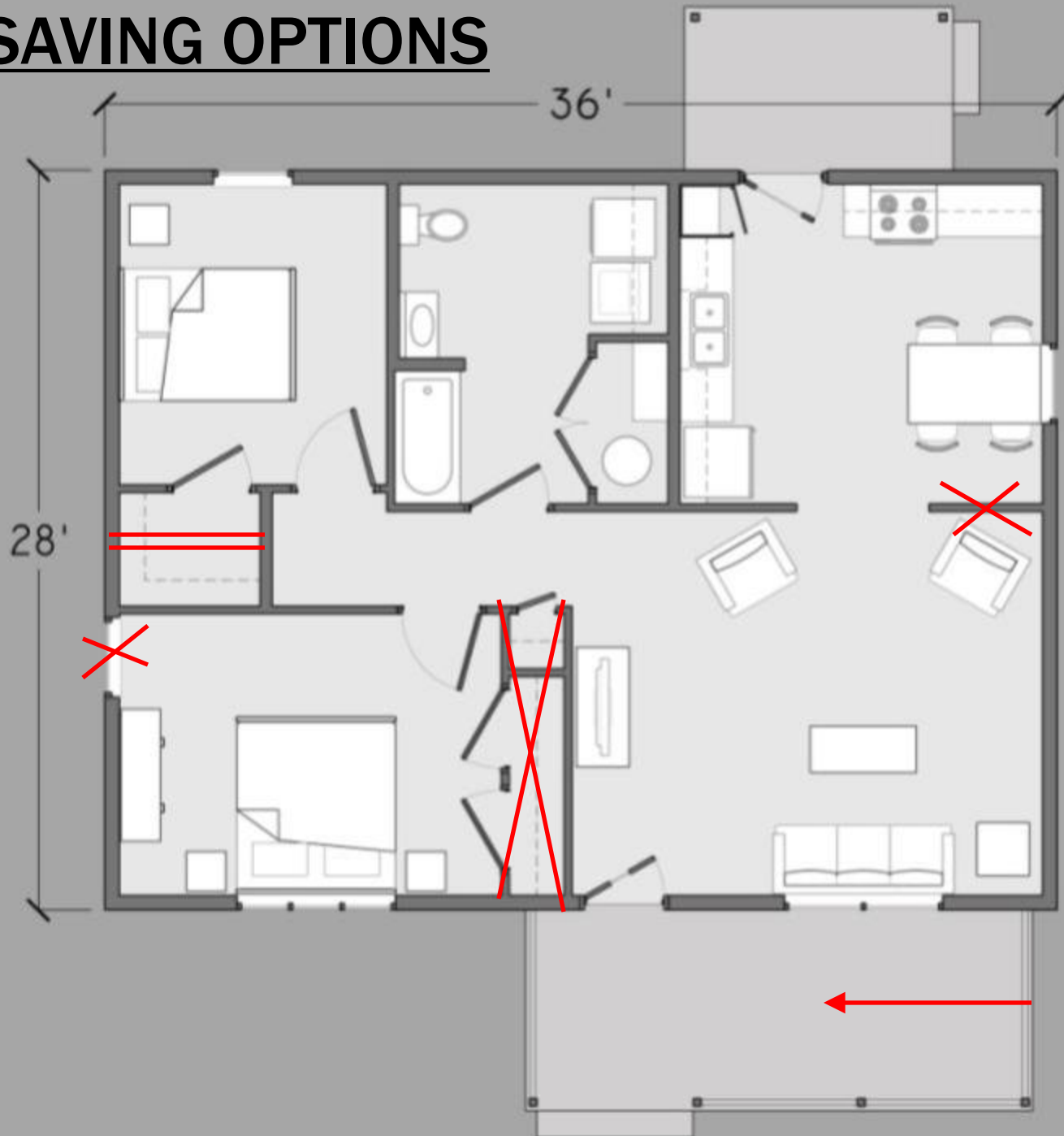
SHUMATE PV COST

Materials	\$5110
Installation	\$720

**ADDITIONAL COST FOR
PV POWER:
\$5830**

**ANNUAL SAVINGS
\$224**

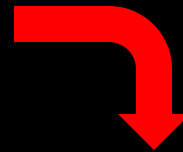
COST SAVING OPTIONS



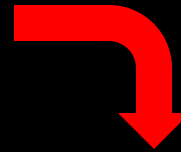
COST SAVING OPTIONS



COST SAVING OPTIONS



COST SAVING OPTIONS



FLINDERS HOUSE

1 Bedroom / 1 Bath

616 SF





FLOOR PLAN



3 BEDROOM EXPANSION

BUILDING ENVELOPE

FOUNDATION

- Conditioned crawlspace
- 8" Concrete masonry walls
- R-10.5 EPS foam board insulation

WALLS

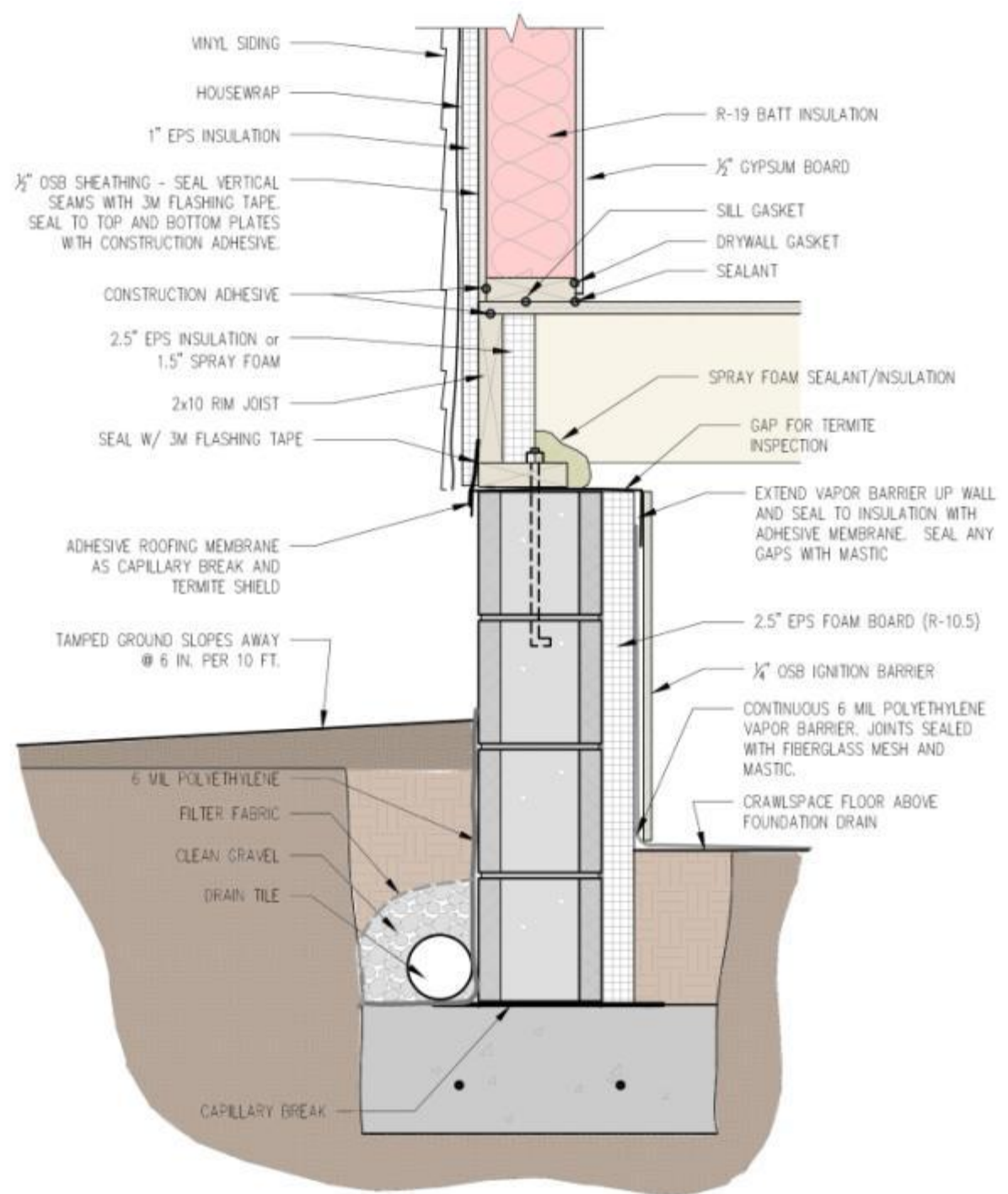
- 2x6 Advanced framing with taped OSB sheathing
- R-19 Fiberglass batt insulation in wall cavities
- R-4.2 Continuous EPS foam board insulation nailed to OSB
- Housewrap weather barrier

CEILING

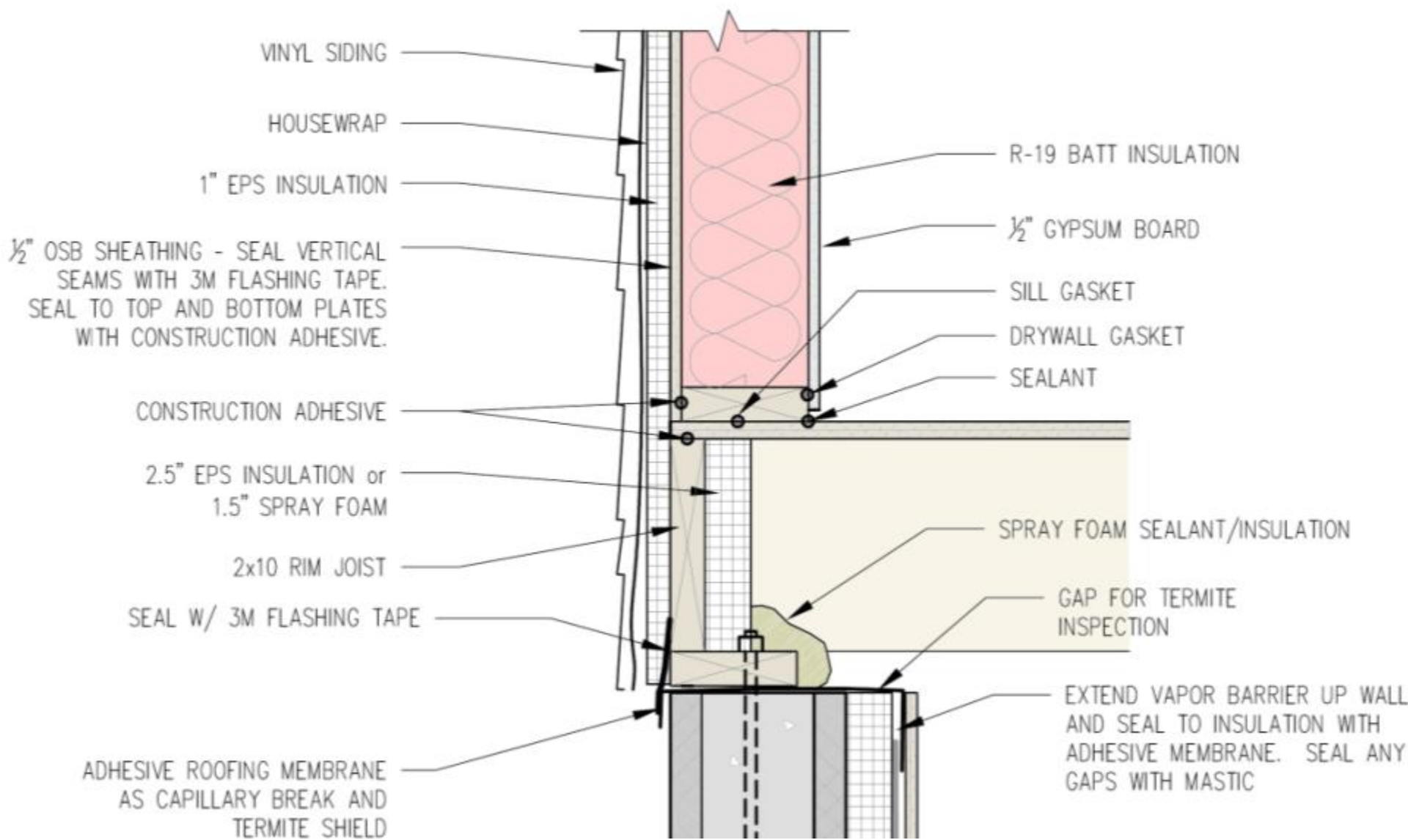
- Raised heel/energy trusses
- R-50 blown-in cellulose insulation

FOUNDATION/WALL

DETAIL



FOUNDATION/WALL DETAIL



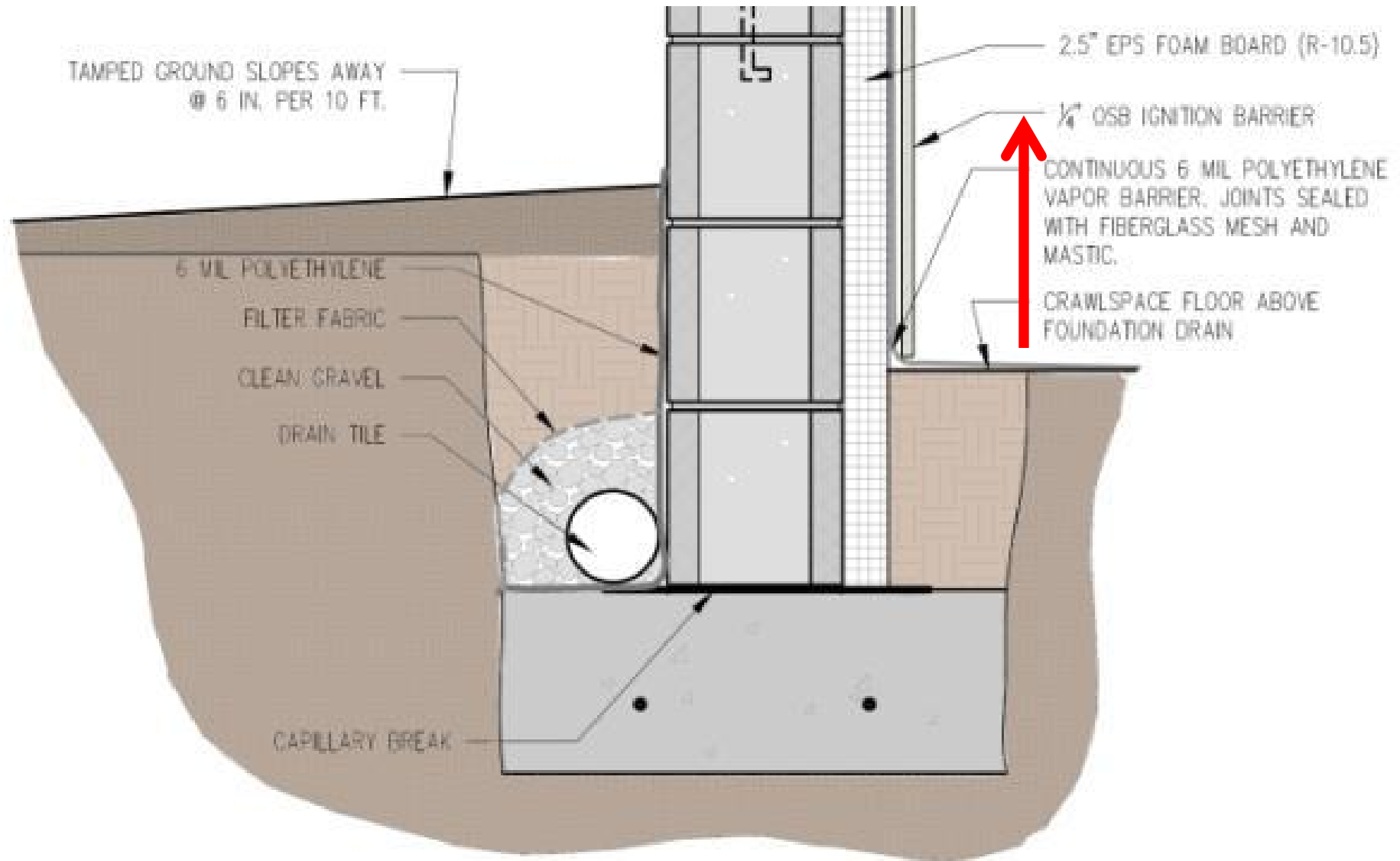






Crawlspace floor raised above grade:

No foudation drain and damproofing required.

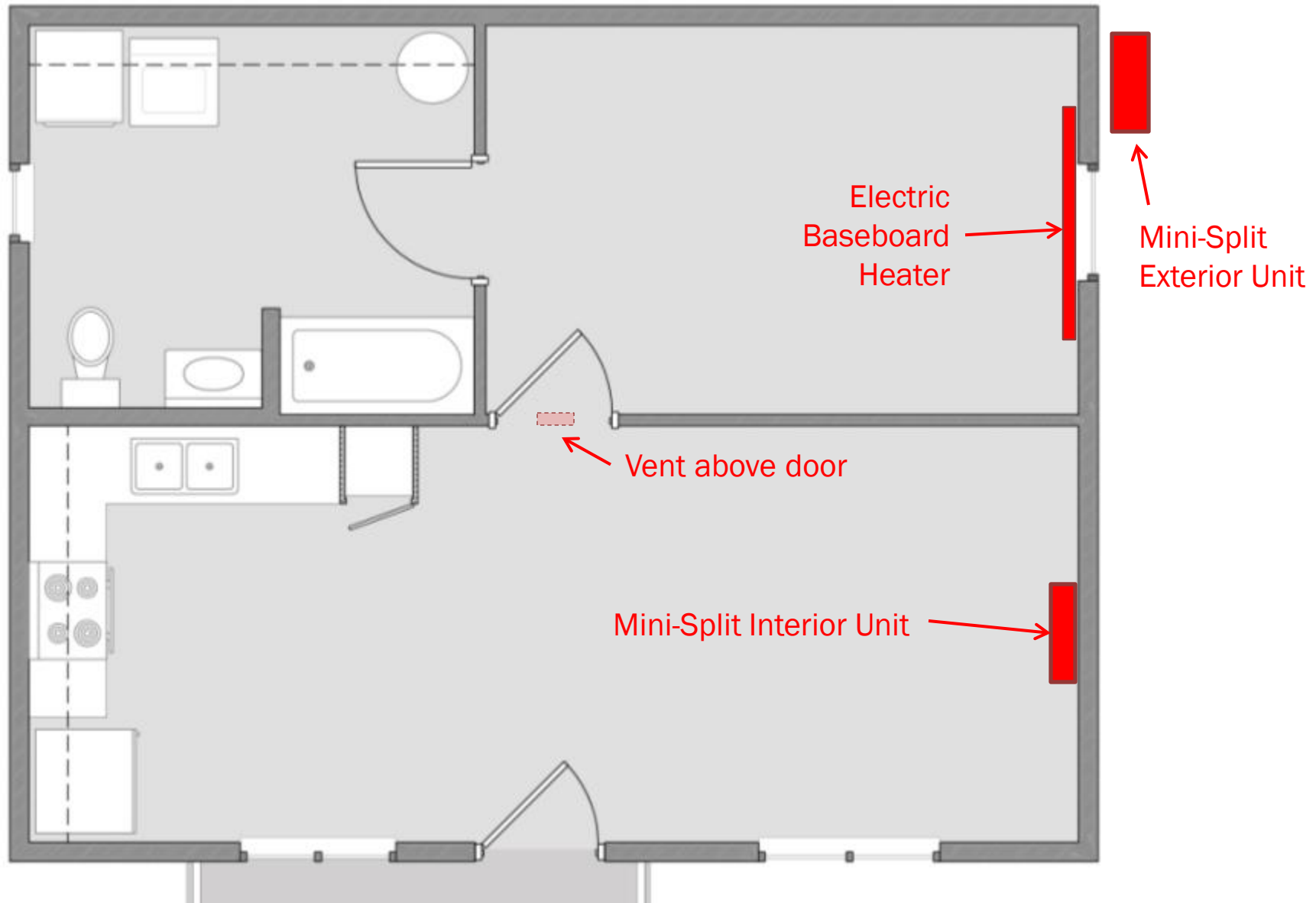






HEATING, AIR- CONDITIONING, & VENTILATION

HEATING & COOLING PLAN

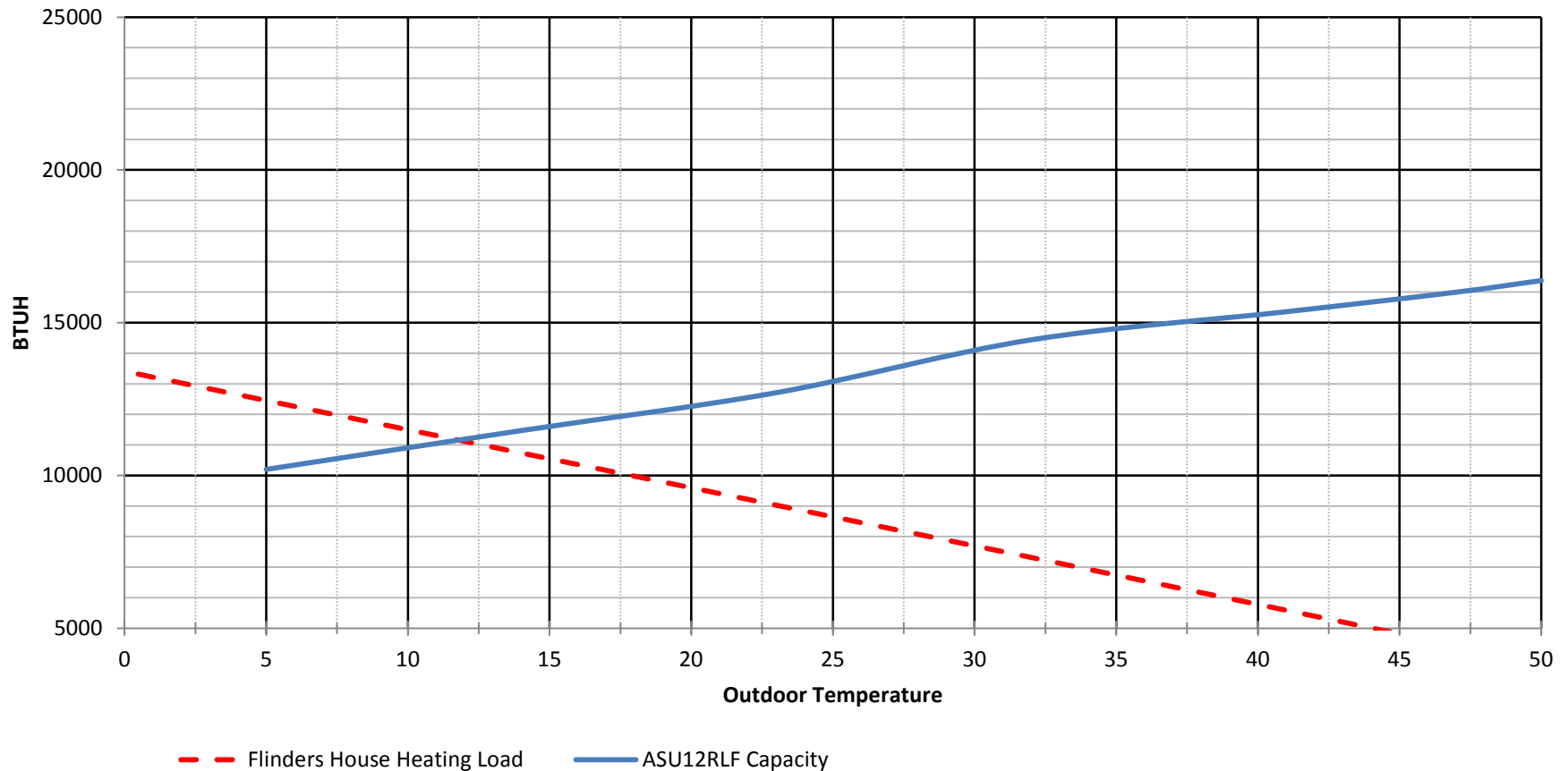


MINI-SPLIT HEAT PUMP PERFORMANCE

FUJITSU AOU12RLFV:

SEER = 22 HSPF = 11.0

Flinders House Balance Point Diagram



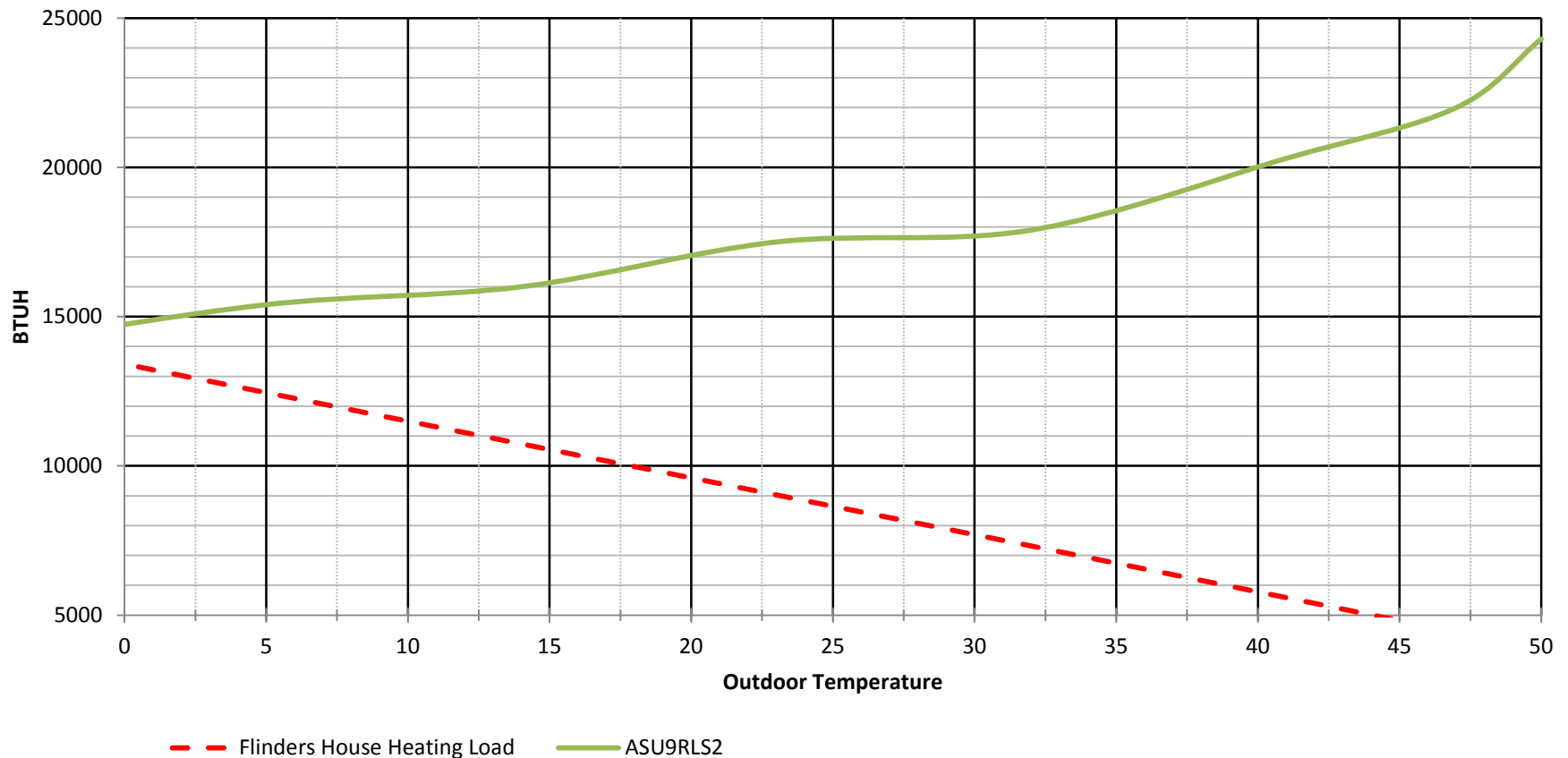
MINI-SPLIT HEAT PUMP PERFORMANCE

Newer model

FUJITSU ASU9RLS2:

SEER = 27.2 HSPF = 12.5

Flinders House Balance Point Diagram



Crawlspace access hatch in floor.

Vent from house to crawlspace

Whole house exhaust fan
in crawlspace

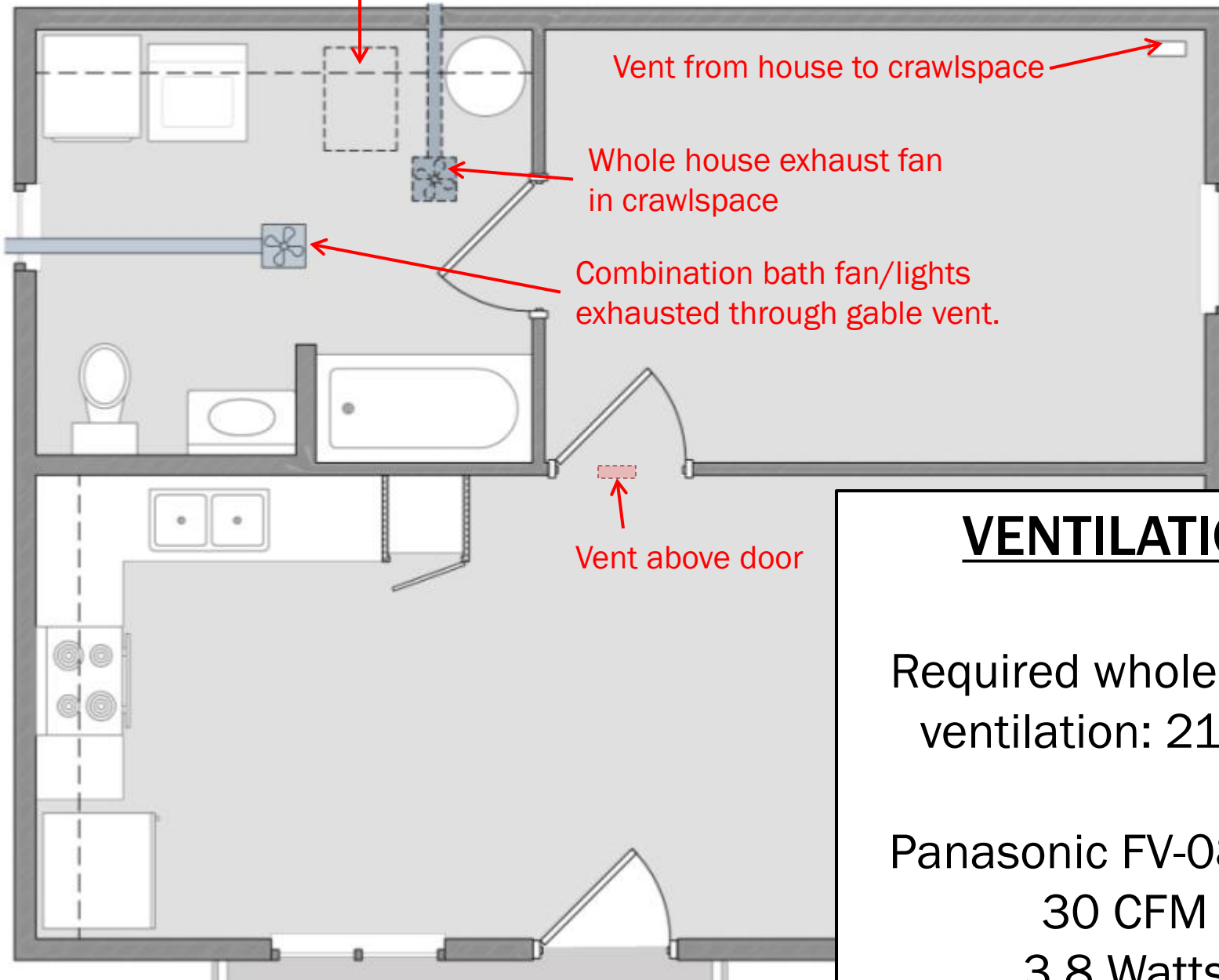
Combination bath fan/lights
exhausted through gable vent.

Vent above door

VENTILATION

Required whole house
ventilation: 21 CFM

Panasonic FV-08VKS3
30 CFM
3.8 Watts



WATER

Standard Electric Water Heater

Compact Plumbing Layout

Longest line about 12' (horizontally)

Low Flow Plumbing Fixtures

- 1.75 GPM Shower Heads
- 1.5 GPM Lavatories
- 1.3 GPF Toilets

High Efficiency Top Loader

Pipe Insulation

R-4 insulation on hot and cold water lines

EQUIPMENT

CLOTHES WASHER

Energy Star - \$14 per year

REFRIGERATOR

Energy Star - \$44 per year

LIGHTING

All CFL bulbs

ENERGY PERFORMANCE

AIR LEAKAGE

318 CFM50

2.6 ACH50

HERS RATING

55

PREDICTED ANNUAL ENERGY COSTS

Heating	\$166
Cooling	\$27
Hot Water	\$208
Lights/Appliances	\$282

TOTAL \$683

COST

PSHH Labor	\$16,347
Materials	\$26,155
Subcontractors	\$7,869
Services	\$1,397
Overhead	\$9,174
Volunteer Labor	\$1,240

TOTAL \$62,182*

* Does not include lot costs.

APPRAISAL

No appraisal performed.

House sold for \$56,500.

LESSONS LEARNED

PEOPLE'S SELF-HELP HOUSING

HOMEOWNER'S MANUAL

A Guide to Maintaining Your Home and
Getting the Most Out of It

CONTENTS:



1. Welcome
2. Special Features
3. Daily Operation
4. Preventive Maintenance
5. Common Problems

DEHUMIDIFIERS

PSHH has installed dehumidifiers in several homes:

- Most were in early attempts at conditioned crawlspaces.
- Some had oversized air conditioners.
- Homeowner lifestyle typically played some role.
- Installed on a shelf above clothes washer to take advantage of the washer drain.
- Effectively controlled moisture throughout home.