



Oak Ridge™

Foam & Coating Systems, Inc.

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Oakridgepoly.com

Why Insulate With Foam?

Why insulate with foam insulation? It's a good question. And in these days of soaring energy costs and uncertain supplies, there is an obvious answer. We believe you should harness the insulating power of foam insulation for use in your home. Not only is it a wise decision, but it is also practical to accomplish with a 21st Century state-of-the-art sprayed foam insulation called [Spray Foam Insulation](#) You already know how well foam insulates. Think about the effectiveness of some common foam products that we use on a regular basis:

The Foam Coffee Cup...



..Just 1/8" of Foam With A R-value Of Less Than One.

Go to your favorite fast food restaurant or 7-11 store and buy a cup of coffee. Hold the foam cup in one hand and pour yourself a cup of steaming hot coffee with the other hand. Go ahead...you won't burn your hand. The foam cup will only be warm to the touch. In fact, if the foam was a bit thicker, it is doubtful if you could feel whether the coffee was hot or cold. Only the steam would give it away. In this example, we think you'll agree that just 1/8" of foam is a pretty effective insulator.

The Foam Picnic Chest...



..Just 1/2" of Foam With An R-value Of Only About Two.

This is the classic example of the insulating power of foam *and* a great illustration of the importance of air sealing the area you want to heat or cool. Consider your experience with a foam picnic chest. You can learn a great deal about insulating your house from its' performance. You buy one at the local drug store or Wal-Mart for a couple of dollars, and you entrust it to keep your beverages cold for the weekend. Put in the drinks and a bag of ice on Saturday morning, and put the lid down tight, and it's pretty likely that you'll still have ice left on Sunday night. (Whether or not there are drinks left is another question!) You have just proved the insulating power of about a half inch of foam with a relatively low R-value (resistance to heat flow) of only about an R-2. (Frankly, if your house was as efficient as this foam picnic chest, you'd be ecstatic!)

HERE'S AN AGE OLD RIDDLE ABOUT INSULATION.

Q. Which is More Important...

Obtaining a Higher R-Value or Stopping Air Infiltration?

This is an extremely important question. Let's say, for example, that you put in the sodas and the ice in the foam picnic chest above, but didn't put the lid down tight. The ice would only last a few hours at best, and your drinks would probably be lukewarm (or hot) by mid-day on Saturday. What happened? The R-value didn't change...it's still an R-2! So why did the ice melt? **Because you allowed air to leak into the picnic chest.**

What should we learn from this example? The efficiency of the picnic chest does depend on the insulating power of the foam (its R-value), but its insulating ability is somewhat irrelevant if you don't also control air infiltration

The answer to the riddle, in our example, is that **CONTROLLING AIR INFILTRATION HAD MORE TO DO WITH KEEPING THE DRINKS COLD THAN THE R-VALUE DID!**

What does all this have to do with your new house? We think the same is true for your new home, and we believe that your experience with a foam picnic chest is the most convincing argument that you should insulate your new home with foam.

Why? Because foam not only insulates extremely well, t it will also stop air infiltration far better than fiberglass products.



**OK! OK! You've convinced us To Insulate
at the Same Time.
So Tell Us More About Spray Foam Insulation**



***Here's a recent application of Spray Foam Insulation
that we installed in a new home under construction in Elk River, MN
This foam is not only a great insulator...but a great air barrier, as well.***

Now that you are gaining an appreciation for the benefits of foam, let's see how applying it in your home can make it so much more efficient? You've just seen how well 1/8" of foam insulates. And you've seen a dramatic example of how well 1/2" of foam can both insulate and air seal. **But here's the good news. In your home, we propose foam from seven to eleven times thicker than the foam in a picnic chest.** Imagine the efficiency you can achieve with that much foam, both to insulate it *and* to prevent excess air infiltration. The result? A home that will be more comfortable and efficient and affordable to operate. And a home well prepared to cope with the energy uncertainties we are certain to face in the years to come.

Following are some of the questions we've been asked about

Spray Foam Insulation

What Is SPRAY FOAM INSULATION

SPRAY FOAM INSULATION is an insulation and air sealing system that is ideal for residential applications. An application of Spray Foam Insulation® combines both a material and a service. The material is a lightweight foam compound called poly **SPRAY FOAM INSULATION**. The service is custom installation of each stud cavity or rafter cavity of a building directly on the construction site by trained, licensed installers. Spray Foam Insulation® is much more than just another insulation. By virtue of its low permeability to air infiltration, its adhesion to other building materials and its flexibility, it provides good air leakage control, moisture control, and sound control, as well as great insulation, all in one application.

Does Spray Foam Insulation Have Building Code Approvals?

Yes! Spray Foam Insulation has approval of all four major building codes in the United States and the Canadian building code. In fact, it is one of the most extensively tested insulation products ever. Concern in the 1970's over the excessive off-gassing of an early foam product called urea formaldehyde, and related concerns in subsequent years over the health effects of other insulating products, specifically asbestos and fiberglass, have resulted in some of the most thorough and sensitive emissions testing of a new building product to date. Based upon the

results of this stringent testing, Spray Foam Insulation met the requirements of the building codes and subsequent re-certifications as required on a periodic basis.

What Are The Advantages Of Spray Foam Insulation®?

The major advantage of Spray Foam Insulation is that it does more than just insulate. It also wind proofs and air seals wall and ceiling cavities from air movement, with a 3 1/2" sample of foam proving to be about 24 times less permeable to air infiltration than a similar thickness of fiberglass batt. In addition, the insulating power of Spray Foam Insulation is not diminished by lower temperatures or by air movement. Its R-value performs as stated. By contrast, some building experts state that an R-13 fiberglass batt in the presence of a 10 mile per hour breeze (the real world) diminishes the insulating power of a batt to an R-5! Hardly the kind of protection from heat and cold you were hoping to arrange for your family.

What Is Spray Foam Insulation Made Of?

SPRAY FOAM INSULATION is an organic material developed from products of the petrochemical industry. It is a two-component system that is sprayed like paint. The chemical constituents are similar to those used in the manufacturer of many products already in your home, such as upholstery foam and the foam used for pillows and mattresses---although the properties of the foam are different.

SPRAY FOAM INSULATION is an environmentally friendly urethane in which the ozone-robbing CFC's have been replaced with air and water.

How Long Does It Take To Cure?

The foam is created within seconds after spraying. You can watch it expand within seconds to 120 times its original volume, literally before your eyes. It completely cures within a few minutes.

Does Spray Foam Insulation Absorb Water?

No; it looks like a sponge but it is actually hydrophobic, i.e. it repels water. If placed in water it will float, and on removal, it will dry rapidly with no loss of insulating properties. If you ever have a roof leak or plumbing leak in your home which would soak the insulation, the water

will ultimately settle out of Spray Foam Insulation® and it will not damage the foam. We can't say the same for other insulations. Water breaks down the glue in a fiberglass batt so the batt is destroyed and loses its effectiveness. Water also turns cellulose (ground newspaper) to mush and it dries out VERY slowly (have you ever tried to dry out a wet newspaper?). The cellulose settles into a lump leaving a large un-insulated cavity in the wall. Of course, if it remains wet long enough, it can cause wood to rot and foster mold or mildew growth within your walls.

Does Spray Foam Insulation Entrap Water?

No. As stated above, Spray Foam Insulation is open cell foam which is ideal for architectural purposes. The foam breathes slowly, and any moisture in the buildings' concrete or lumber can escape through the foam as the building dries out, thus eliminating any risk of lumber rot or mildew usually associated with materials that trap moisture.

How Long Does Spray Foam Insulation Last? Does It Change Physically?

Aging is not an issue with **SPRAY FOAM INSULATION**. It is inert, and its physical and insulating properties are constant.

Are There Glass Fibers or Formaldehyde In SPRAY FOAM INSULATION?

No to both. Glass fibers have been listed as a suspected carcinogen by the EPA and most fiberglass batt manufacturers now print a warning label on the wrapper. Formaldehyde was present in early commercial foam called urea formaldehyde which was also used in residential applications in the early 1970's. Spray Foam Insulation® is free of both glass fibers and formaldehyde and is a great choice for insulating your new home.

Article in Builder Magazine: COST

'Real Home Cost' by C. B. Farnsworth

"Trying to sell energy efficiency? Paul Huddy of Tucson, AZ based Solar Institute says the initial costs - price plus financing over 30 years - are only one-third of the homeownership cost pie. (Sticker price is a mere sliver at 11 percent of ownership.) The second third is operating costs (including utilities) and the last third, home maintenance and repair. Thus, a sticker price of \$160,000 equals 30-year ownership costs of \$1,440,000! But pony up \$200,000 to buy a more energy-efficient house and operating and maintenance costs tumble by 75 percent that brings the 30-year cost down to \$840,000 - a savings of \$600,000.

What is the difference between open and closed cell foams?

Open cell foam performs two functions; it stops the movement of air and slows down the transfer of heat. Open cell foam products are generally not considered vapor retarders. In climate zones 6-8 a vapor retarder system may be required on the warm side of the insulation relative to the design of the wall or ceiling system. Closed cell foams, on the other hand, have low vapor permeance due to their cell structure. These foams, depending on thickness, may be considered a vapor retarder but not a vapor barrier. Closed cell foams also have a high compressive strength which allows them to be used for exterior applications. Open cell foam should never be used for exterior applications. Open cell foam is usually more cost effective because of their higher yields. Please work with your local Certified Spray Foam Insulation dealer to determine which product works best for your specific application.

MATERIALS/SOUND INFORMATION

A. Spray Insulation: hydrophobic, low-density, open-cell modified polyurethane; conforming to the following:

1. Thermal Resistance (R-Value/inch): ASTM C518; 3.8 hr/sq ft/degree F/BTU. In.
2. Air Permeance (for 5.25 inches of material): ASTM E283-91 0.00013 ft 3.ft² (Reduces air movement – helping the sound stay in the foam insulation)
3. Water Vapor Transmission (for 5 inches of material): ASTM E96; 10 perms.
4. Sound Transmission Class (STC): ASTM E413-87; STC 39 in wood stud wall.
5. Noise Reduction Coefficient (NRC): ASTM C 423 75
6. Corrosion: No significant corrosion when in contact with steel under 85 percent relative humidity.
7. Surface Burning Characteristics (6”) Flame Spread Index 21 Class 1 Material

“QUIET FOAM” by OAK RIDGE FOAM & COATING SYSTEMS, INC.

Unique air sealing qualities can help reduce airborne sound from penetrating your home. If you live near a busy street or an airport, you know all about airborne sounds – the unwanted noises that can invade your living space, hindering your comfort and enjoyment.

Material/Sound Information

Foam is an effective barrier to airborne sounds. Its superior fit makes it an ideal sound proofing system, reducing airborne sound transfer through the roof, floor and walls. Outside noises such as road traffic, aircraft and trains stay outside. Inside, there are far fewer complaints about next door or next floor noises.

Foam is also ideal for soundproofing interior walls in your entertainment room and washrooms or around plumbing stacks to reduce the sound of water rushing to drainage below.

AIR SEALING: FOAM ADVANTAGE

Air leakage is the greatest source of energy loss in your home. Fortunately, there’s a unique soft foam insulation that expands to fit into corners, cracks and crevices for an air tight seal. Its perfect fit virtually eliminates air leakage. By controlling air leakage, buildings can perform up to 50% better than with traditional methods. This means lower energy demands, less wear and tear on your HVAC equipment and enhanced resale value.

WHAT MAKES A BETTER BUILDING?

Can Friendly Insulation eliminate moisture problems?

Yes, because air leakage is the culprit, the only way to eliminate moisture problems is to air-seal the building envelope. By eliminating air movement through walls, floors and ceilings, moisture laden air cannot pass through and affect the indoor environment thus allowing you to control humidity levels to within the 45% to 50% range; a level at which molds, mildew, dust mites and many allergens cannot be sustained.

What are some of the value-added benefits?

Sound and odor control: On its own, Friendly Foam Insulation is not intended to be a sound proofing solution, but it is an effective barrier to airborne sounds and thereby offers sound proofing properties. Its' superior fit reduces airborne sound transfer through roof, floor, and walls which means it does double duty and becomes part of a cost-effective sound proofing solution.

Thermal Envelopes

Standard residential and commercial building construction has traditionally designed vented attics without regard for regional and climatic conditions. Also, many vented attics are not designed and constructed in accordance with properly proportioned eave and ridge venting. This can accentuate the problem of extreme attic conditions. In warm, humid climates, attic temperatures can reach well in excess of 150 degrees. This, coupled with the infiltration of moisture laden air and attic pressurization, can cause a myriad of problems for energy efficiency, indoor air quality, condensation and comfort. An attic cannot be vented enough to minimize these conditions. Attic fans can cause infiltration problems and negative air pressures in the envelope. The ambient outdoor conditions would be preferable to the

extreme attic conditions that are created. The Thermal Envelope utilizes an un-vented (sealed) attic design that places the insulation at the roof plane in lieu of at the ceiling, thereby bringing the entire building envelope within the thermal and air barrier. Research has proven that there are many benefits to this method. By locating the thermal and moisture barriers at the same plane, it eliminates the opportunity for moisture to enter the attic and condense on cold mechanical systems. Moisture will not condense within Friendly Foam Insulation spray foam insulation making it the ideal material for this application. The Florida Solar Energy Center (www.fsec.ucf.edu) attributes 65% of the infiltration in the average Florida (USA) home to the attic. This coupled with duct leakage, can place an insurmountable burden on the mechanical systems to maintain indoor air quality and occupant comfort. Frequently, the result is a “sick building or home,” leading to occupant illness. There are many contributing factors; however, the most significant element is the failure of the building Envelope. If we first address how we correctly build the “closed-box,” we can then better engineer the mechanical systems within that “box”.

It's Your Money. Would You Rather Keep It, Or Spend A Pile Of It Every Month On Heating And Cooling Costs?



The way you insulate your new home will determine whether you hold on to your money, or whether your utility company will get it.

Below is a financial example that shows the benefits of investing some extra money up front to install a better energy package, featuring [Spray Foam Insulation](#), rather than paying "an arm and a leg" for heating and cooling costs every month for as long as you own your home.

Let's See How [Spray Foam Insulation](#)

Can Save You Money!

Everybody knows that home heating costs are up. WAY UP! But many families are not willing to pay the utility companies any more than they absolutely have to pay. They're deleting the standard fiberglass insulation that their builders were going to install, and upgrading to **SPRAY FOAM INSULATION**. To help them save 30-50% on heating costs.

This upgrade can save these families real money. Let's take a look at a typical Twin Cities area house as an example. Assume that it has about 3,500 square feet of finished living area, and that it will cost \$4,125.00 extra for **SPRAY FOAM INSULATION**. Now assume that 80% of the total \$5,000.00 investment will be financed, with a \$4,000.00 loan and a \$1,000.00 down payment. If the interest rate was 7% APR the monthly

loan payment would increase by \$6.65 per thousand per month, for a total increase in the house payment of \$26.60 per month "before taxes" for **SPRAY FOAM INSULATION**®. Watch what happens:

Original Investment	\$ 5,000.00
Less 20% down payment	\$ 1,000.00
Portion of Investment Financed	<u>\$ 4,000.00</u>
Cost of Money @ 7% APR (\$6.65 x 4)	\$ 26.60

Since in the early days of the loan almost all the monthly payment is interest, and deductible, and since most purchasers will have a combined tax rate for federal, state and local taxes of at least 40%, the net cost after taxes for the **SPRAY FOAM INSULATION** investment is only 60% of the \$26.60 monthly payment, or \$15.96 per month.

Cost of Borrowing \$4000	\$ 26.60
Less 40% deductible portion of payment	<u>\$ -10.64</u>
Actual Cost per Month SPRAY FOAM ®	\$ 15.96

Our second consideration is the cost of heating and cooling, which we will conservatively assume to average \$200.00 per month...probably higher! Of course, the cost of heating and cooling a home each month is NOT deductible, and must be paid with after-tax dollars each month. Now let's say in this example that the new home with **SPRAY FOAM INSULATION** in the walls and ceiling could be heated and cooled for 40% less than a home insulated with fiberglass batts, for a potential average savings per month of \$80.00 per month in "after tax" dollars on a net \$15.96 per month investment.

Est. Avg. Monthly Heating/Cooling Costs	\$ 200.00
Likely 40% Savings/Month w/ <u>SPRAY FOAM</u>	\$ 80.00

Think about it! If you could save \$80.00 per month (or more if energy costs continue to go higher) for a net investment of \$15.96 per month, you'd be "fuelish" not to choose **SPRAY FOAM INSULATION** foam instead of fiberglass insulation alone. Who wouldn't want to get approximately four \$20.00 bills back for every \$16.00 you lay out every month. Of course, if natural gas, propane and heating oil costs continue to increase in cost (who doesn't believe they will?), your investment in a better energy package now could prove to be an even wiser decision later...when it's too late to upgrade the insulation in your home. So,

even though our estimates of future energy costs, the cost of **SPRAY FOAM INSULATION** in a house, and the potential energy savings per month are likely to vary from house to house and family to family, we hope we've helped you see that a home insulated with **SPRAY FOAM INSULATION** in the walls is a smart financial decision for right now...and a hedge of protection for the future.

**SPRAY FOAM INSULATION Foam Insulation for Your Home.
One Family Decision That Really Makes "Cents!"**



Frequently asked questions from foam contractors who wish to use ORFF .5 vs higher density foams

Q: Wouldn't I have to spend quite a bit more time shaving off the excess foam that has protruded past the studs using the ORFF .5? I can control the high density foams more and minimize my cleanup on the studs only.

A: There is a small amount of time required to shave off any excess foam that is sprayed on the studs and rafters of a cathedral type ceiling when using the ½ pound density foam. That time is offset by only having to make one or two passes with your foam gun and allowing you to use larger nozzle sizes to accomplish this using the ORFF .5. Multiple passes with the higher density foams take more time, especially in ceilings where R values of 40-50 have to be obtained. The excess foam that develops when using the ORFF .5 is soft and easy to remove in comparison to the rigid skin on the higher density foams. An experienced sprayer can minimize his waste to a few garbage bags of material per house. Do you install the vapor barrier after spraying your high density foam? Have you calculated the time and money in labor and materials to do that? We find that if you run the numbers, you will find that you are spending quite a bit more time and money by installing the higher density foams.

Q: Isn't the .5 pound foam harder to control? I noticed that it doesn't look as smooth on the surface as the higher density foams that I am used to.

A: It is a little more difficult to control, but because it is covered with interior wall covering, the appearance isn't of much importance.

Q: How often do I have to clean the mixing chamber of my gun when spraying the ORFF .5?

A: Seldom, sometimes all day before it needs to be cleaned. Rigid foams characteristically clog up a gun 2-3 times an hour.

Q: Do I need to recirculate or agitate the ORFF .5?

A: Yes, continued agitation is needed if you pump directly to the machine. It is recommended to preheat the material in the drum set to a minimum of 80 degrees Fahrenheit before spraying in the cold weather months. Recirculation, at the beginning of the shoot, is recommended on all materials in the cold weather months or when you are not spraying everyday. It puts fresh material from the drum into your lines for a good homogenous mix which is necessary for good foam when you start up for the day.

Q: How does the cost of ORFF .5 compare to the higher density foams?

A: The .5 pound foam is almost half the cost of the higher density foams. Higher density foams also require multiple passes in wall and attic spaces where higher R values are required. ORFF .5 can be put on as thick as desired to give you your maximum R value in only one or two passes. For the residential and light commercial insulation business, ORFF .50 is the most cost effective and safest foam to use. Our foam is the most cost competitive compared to any that is on the market today.

MOLD

Newspapers and television programs are increasingly reporting on mold problems with newer homes and schools.



In one such instance, the Ballard family of Texas had their home demolished in April of this year due to mold infestation that could not be removed. Their son suffered permanently scarred asthmatic lungs, while the father lost his memory and his job. The mold got so bad they needed hepa filters to enter the house.

Erin Brockovich and her family are also battling mold related illnesses, like respiratory ailments and chronic headaches, to name a few. Tests on the home revealed serious construction flaws and high levels of several molds. Blood test results indicated a severe reaction to two of the molds that showed up in the home.

There are specific environmental conditions required for mold to propagate. A specific temperature range and source of food are the basic factors that must be in place, but the most important element is the presence of moisture. For more information on mold click below:

- Indoor Air Quality
- Keep Your Home Safe - page1 page2
- <http://www.health.state.mn.us/divs/eh/indoorair/mold/index.html>
- <http://www.cbsnews.com/stories/2002/01/31/health/main326401.shtml>
- <http://www.cnn.com/HEALTH/9711/05/deadly.mold/>
- <http://www.cbsnews.com/stories/2002/01/31/health/main327526.shtml>
- <http://www.cal-iaq.org/mold0107.htm>
- <http://www.hhinst.com/>
- <http://www.healthhouse.org/>
- <http://www.moldtips.com/whatis.htm>
- <http://www.aiha.org>

Moisture can be present within building walls, ceilings, attics, and crawlspaces via:

1. gravity
2. capillary action
3. air leakage
4. diffusion

In order to minimize the potential for mold growth, a building envelope system has to meet all of the following criteria:-

- The building envelope must prevent water from penetrating. Therefore, the structure must be properly sealed and contain an effective drainage plane / rain screen. ·
- The building envelope must control air leakage. Uncontrolled air leakage leads to condensation and mold growth within the building envelope. The Spray Foam Insulation System ® provides a complete air seal - sprayed into the wall it expands 100:1 in seconds, adhering to all surfaces. ·
- The components of the building should resist moisture and once wet should then have the potential to dry quickly (they should be hydrophobic). As supported by test results from leading building product laboratories, Spray Foam Insulation does not wick or absorb water. Moisture passes through Spray Foam Insulation, and once dry, the product returns to its full performance value. ·
- All components should be installed with relative ease and should not be installation-dependent for their ultimate performance. Installed by a Licensed Dealer, Spray Foam Insulation is a quick and effective, one-step insulation and air barrier system. No costly additional labor is required for caulking, taping, window gap foaming, etc.

The key to winning the war against mold is to take preemptive measures for the future health of your family. For more information on how to evaluate your home for susceptibility to mold infestation, please contact us:

ORFF

Architectural Specifications for Stud Wall Cavity Insulation Section 06224

Part One-General

Page 1

1.01 Summary

ORFF provides building envelopes with seamless insulation which substantially reduces air infiltration. It can be applied to the full or partial thickness of stud wall cavities for a total insulation/air barrier package or it can be applied in a ½ to 1 inch thickness in combination with conventional insulation. In either case, air infiltration is substantially reduced due to the sealing characteristics of the spray foam system and eliminates the need for house wrap.

1.02 Quality Assurance

ORFF must be installed by a qualified spray polyurethane foam applicator who is familiar with the operation and maintenance of his equipment and who is familiar with the properties of the CHLTD Spray System which is being applied.

1.03 Material Delivery and Storage

- A. Materials shall be delivered in their original, tightly sealed containers.
- B. Keep the temperature of the chemicals above 65F for several days prior to use. Cold chemicals can cause pump cavitations and therefore, incorrect metering. Storage temperatures should not exceed 100F. Do not store in direct sunlight. Keep drums tightly closed when not in use and under dry gas pressure of 2-3 psi after they have been opened. See individual product data sheets for specific storage recommendations and shelf life information

1.04 Sequence and Scheduling

The spray polyurethane used in the ORFF is applied after the perimeter wall is in place, windows and doors installed, and rough in plumbing and electrical inspections are complete.

1.05 Vapor Barrier: Install vapor barriers as required by local codes

CHLTD closed cell spray polyurethane foam systems provide a degree of vapor retardance themselves. In many circumstances, the use of these closed cell foams eliminates the need for an additional vapor barrier. The foam system used, the thickness to which it is applied, the adjoining building components, the exterior weather conditions and the interior temperature and humidity all affect the need for a vapor barrier. Consult CHLTD for specific recommendations.

1.06 Safety

- A. Handling of liquid components: Use caution in removing bungs from 55 gallon drums. Loosen 3/4" bung and let gas escape before completely removing. Avoid breathing of vapors. In case of chemical contact with eyes, flush water for at least 15 minutes and get medical attention. For further info refer to the "MDI Based Polyurethane Foam Systems: Guidelines for Safe Handling and Disposal" published by the Alliance for the Polyurethanes Industry, 1300 Wilson Blvd. Arlington, VA 22209
- B. 15 minute thermal barrier; Federal, state and local building codes vary. All have requirements that spray applied polyurethane foam insulation be separated from occupied spaces with an approved 15 minute fire rated thermal barrier. One typically approved material is 1/2" gypsum wallboard (sheetrock) applied over the spray polyurethane foam insulation.

Exceptions to the thermal barrier requirement include certain headers, sill plates, attics and crawl spaces. Check the applicable building code and with local officials for specific requirements.

Part Two-Products

2.01 Polyurethane Foam

The polyurethane foam used shall be CHLTD Chemical System ORFF2.

ORPC Chemical System	Application/Use
ORFF	General Construction insulation foam
	1/2 to 1 inch thick applications which will be supplemented with conventional insulation
	Stud wall applications where the spray foam will be the safe insulation
ORFF/W	Cold weather application environment

- 2.02 Supplemental Insulation: Use fiberglass batts or spray on cellulose having the following typical properties: Density 0.6-1.0 lb/cubic ft R value 3-4 hr/Btu-sq.ft.-°F

2.03 Accessories

- A. Joint Filler Foam: ORFF2/CTR
- B. Caulk: Sikaflex, single component polyurethane or equivalent

Part Three-Execution

3.01 Surface Preparation

All surfaces to be sprayed with CHLTD polyurethane foam must be dry, clean, and secure. Remove sawdust and other debris from areas to be sprayed by blowing with

compressed air or vacuuming with a shop vac. Check surfaces to verify dryness. All metal to which foam is to be applied must be free of grease, oil, rust, etc. and primers should be used as necessary.

Mask off all areas that are not to receive spray foam with masking tape and plastic sheeting. Apply release agent to stud facing to facilitate removal of foam.

3.02 Foam Application

Apply spray foam using a picture framing technique: apply a can of foam between the exterior sheathing and the inner stud surface. Then spray apply the required thickness of foam against the sheathing. For a nominal thickness of ½” apply in one pass. For filling the stud wall cavity, apply the foam in two or more passes.

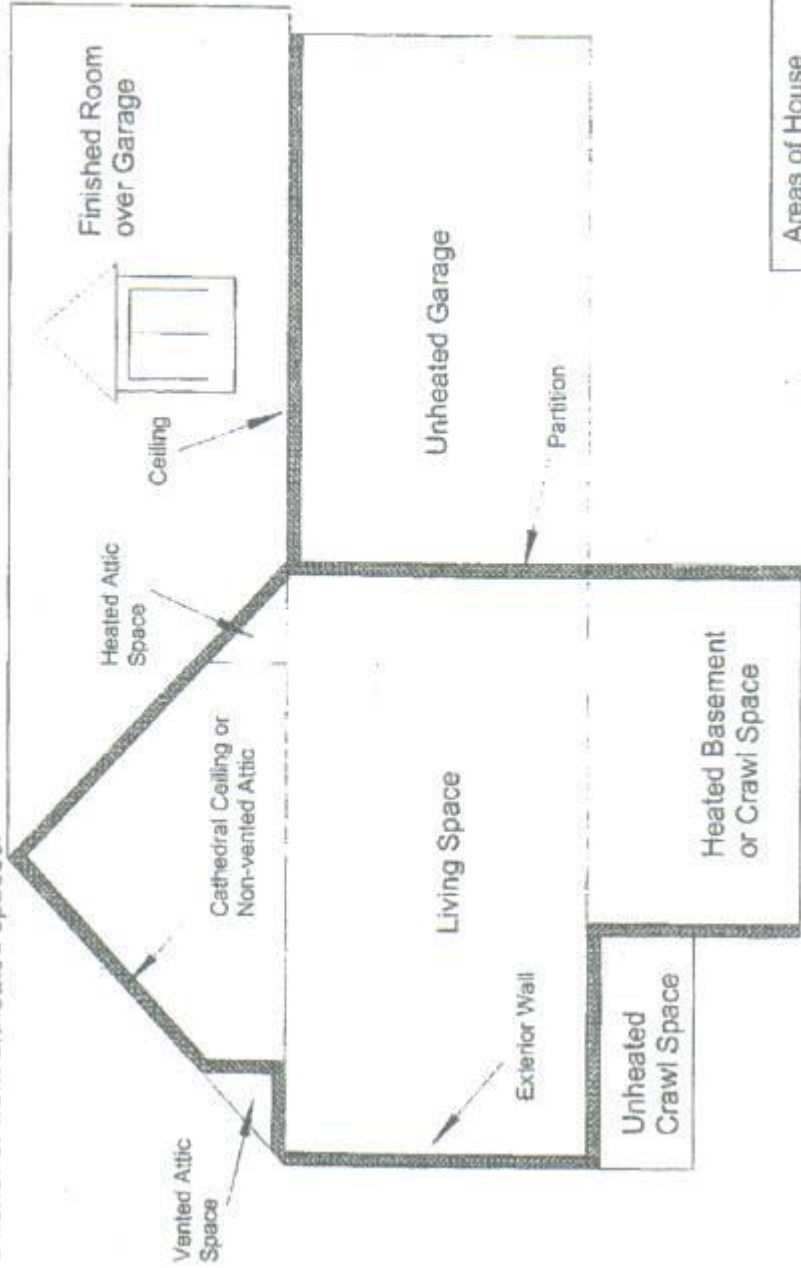
3.03 Accessory Application

- A. Supplemental Insulation (Optional): If the stud wall cavity is not completely filled with spray polyurethane foam, supplemental insulation may be installed to achieve desired R Values.
- B. Joint Filler and Caulk: Use joint filler and/or caulk to seal around windows, doors, chimneys, electrical raceways, sill plates, multiple studs, etc. Caution: Joint filler foam can tighten window frames and door jambs to the point where they will not open or close properly. Care must be used in these areas to avoid distortion of these members.

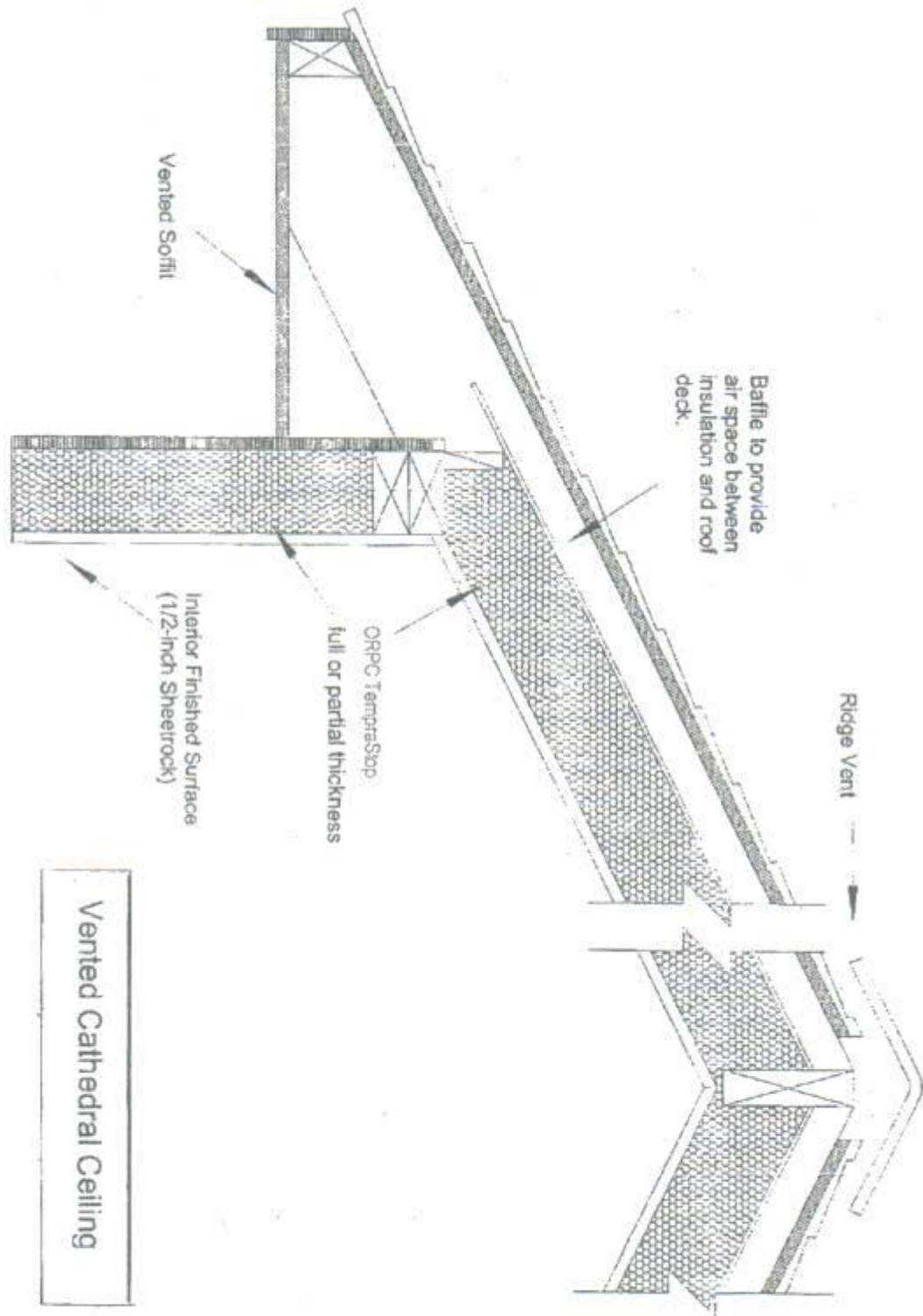
3.04 Clean up

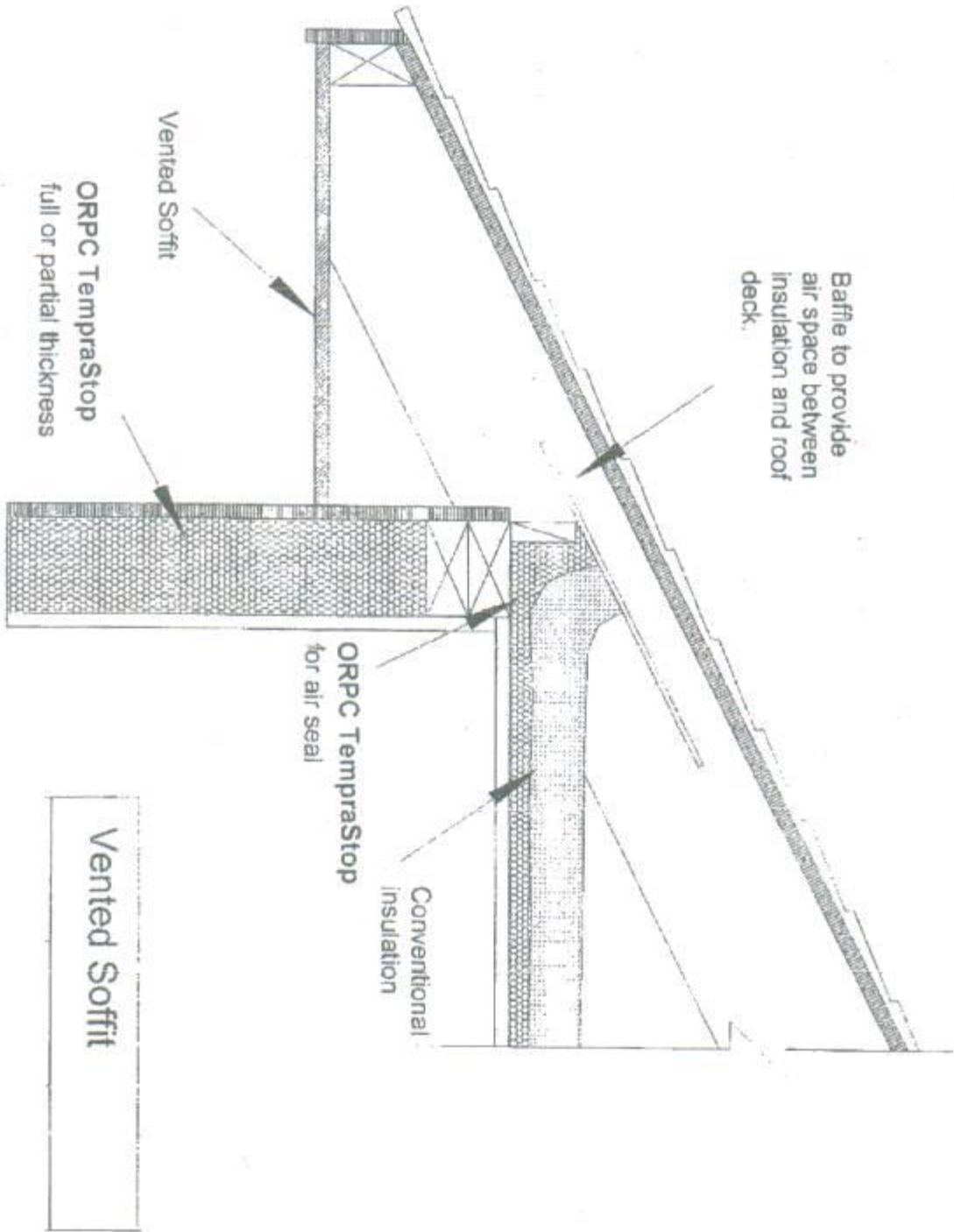
Clean off all overspray and overfill from the interior stud facings. For truly filled stud cavities, shave off the foam face to provide a surface flush with the stud for drywall installation. Remove all masking materials.

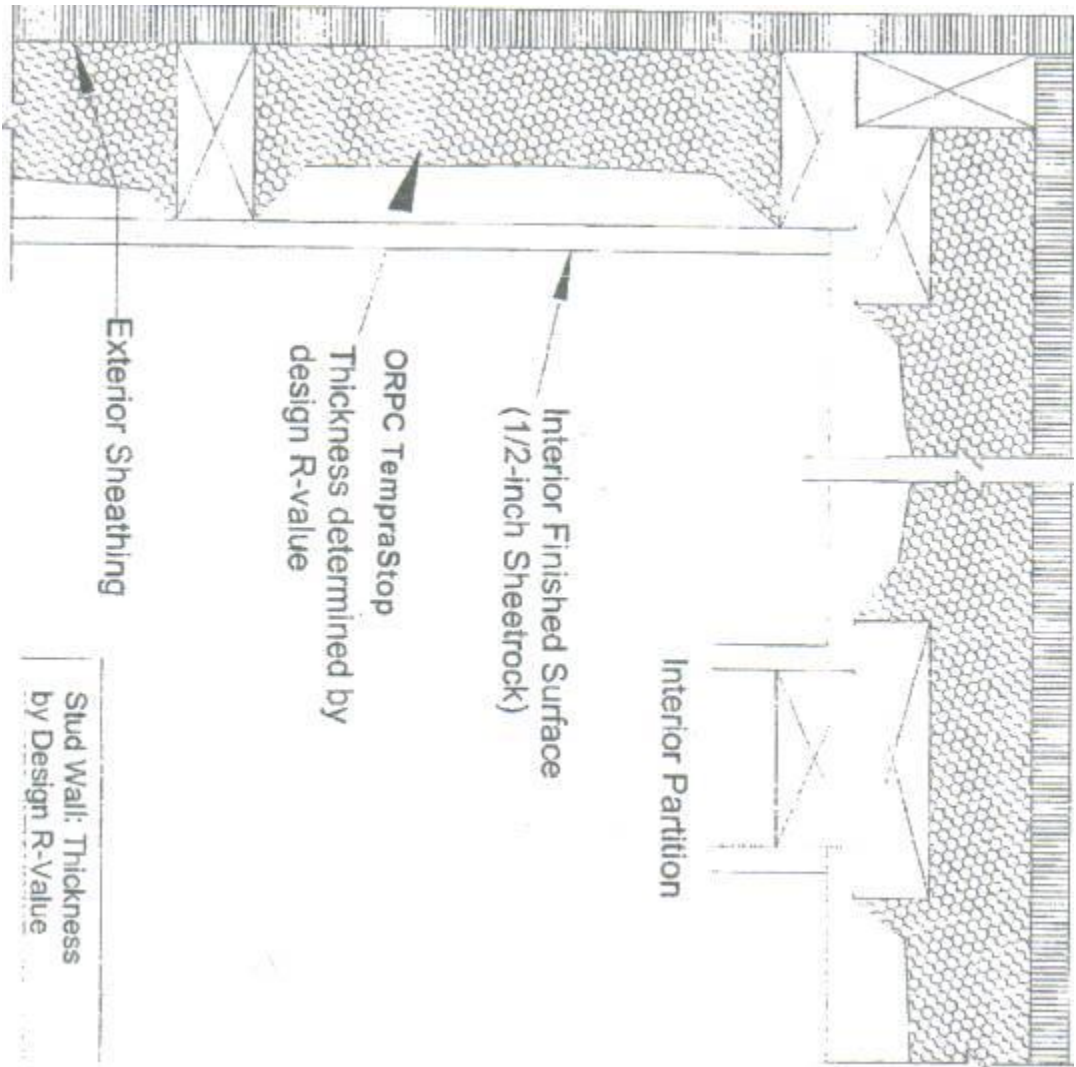
Note: Insulate walls, ceilings, and floors that separate interior areas from the exterior or from unheated spaces.



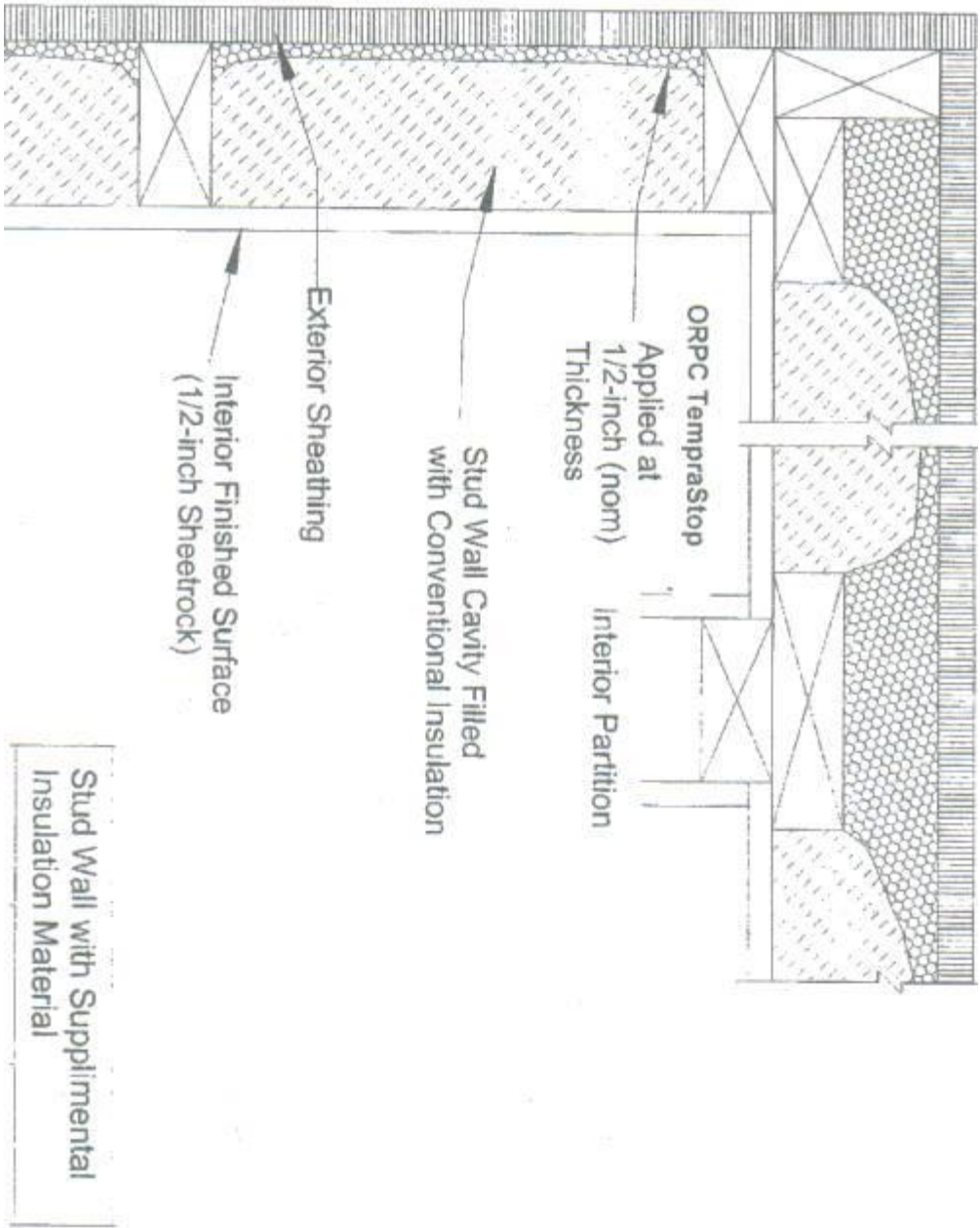
Areas of House to Insulate

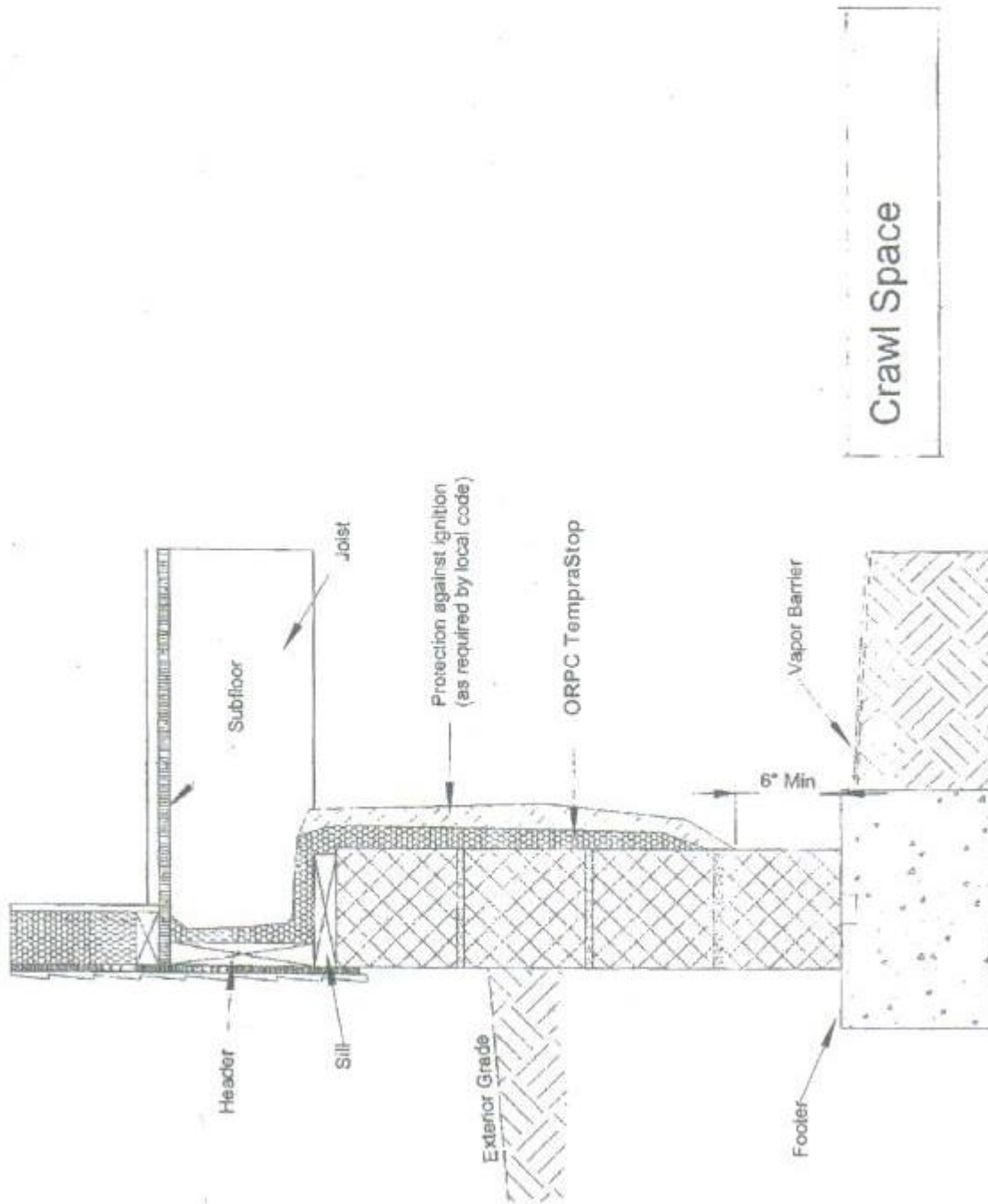


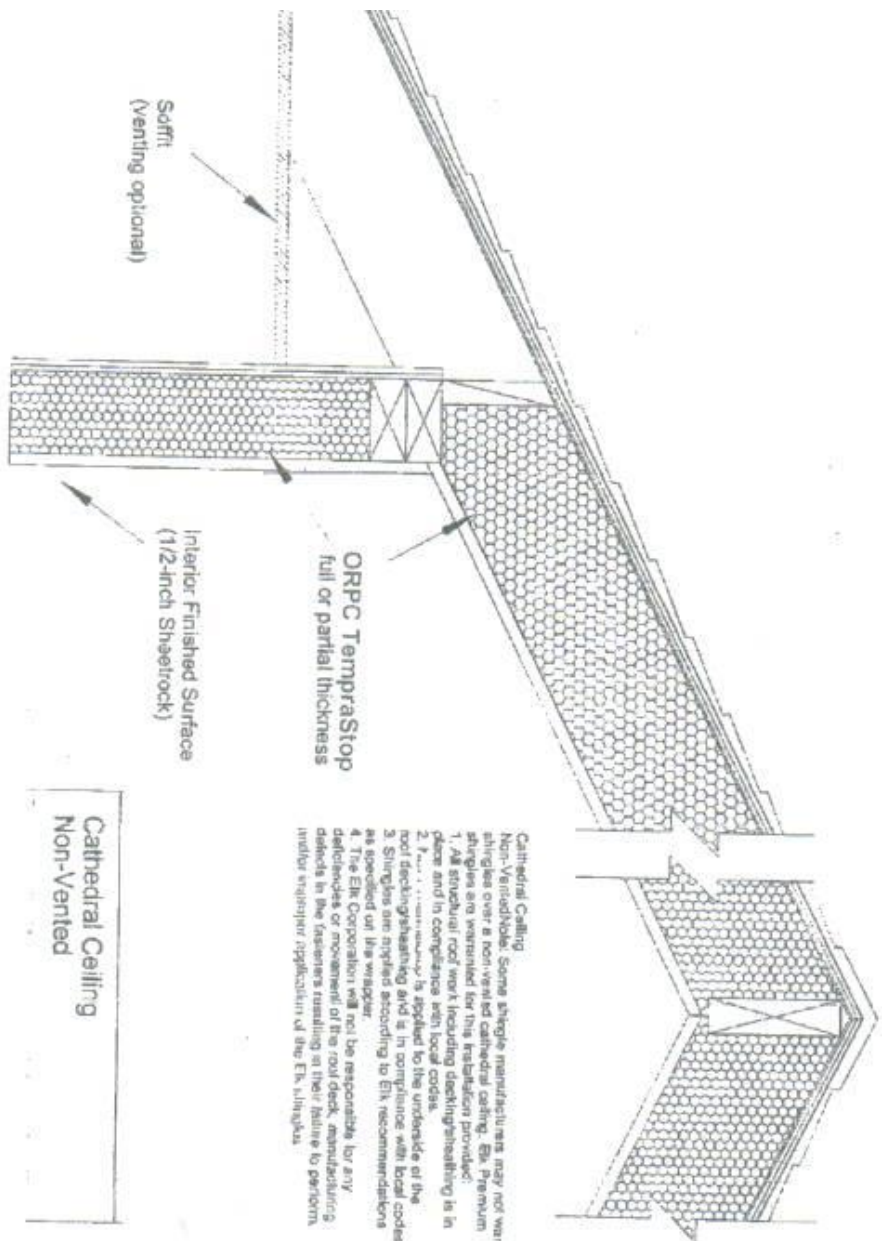




Stud Wall: Thickness
 by Design R-Value



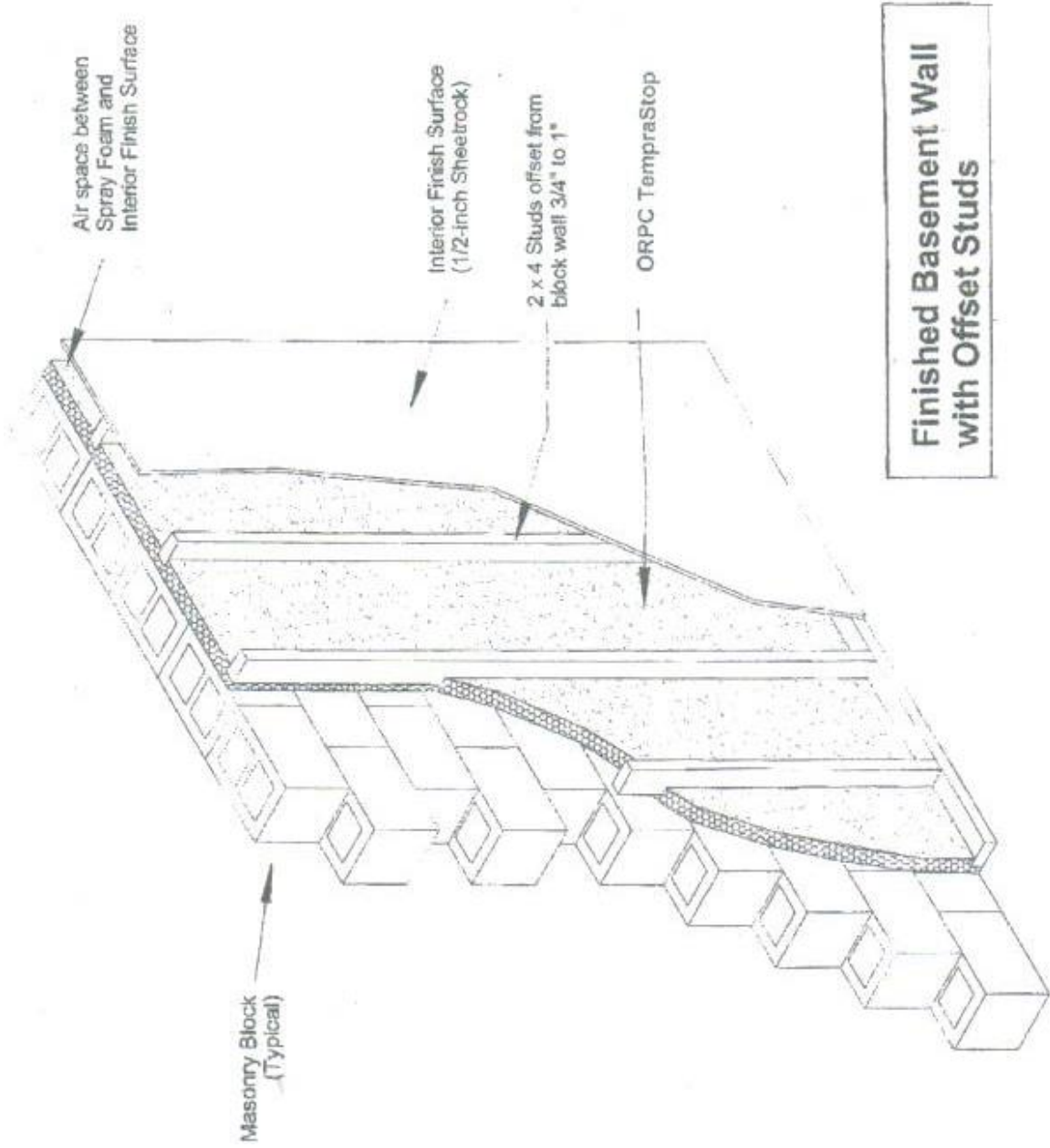




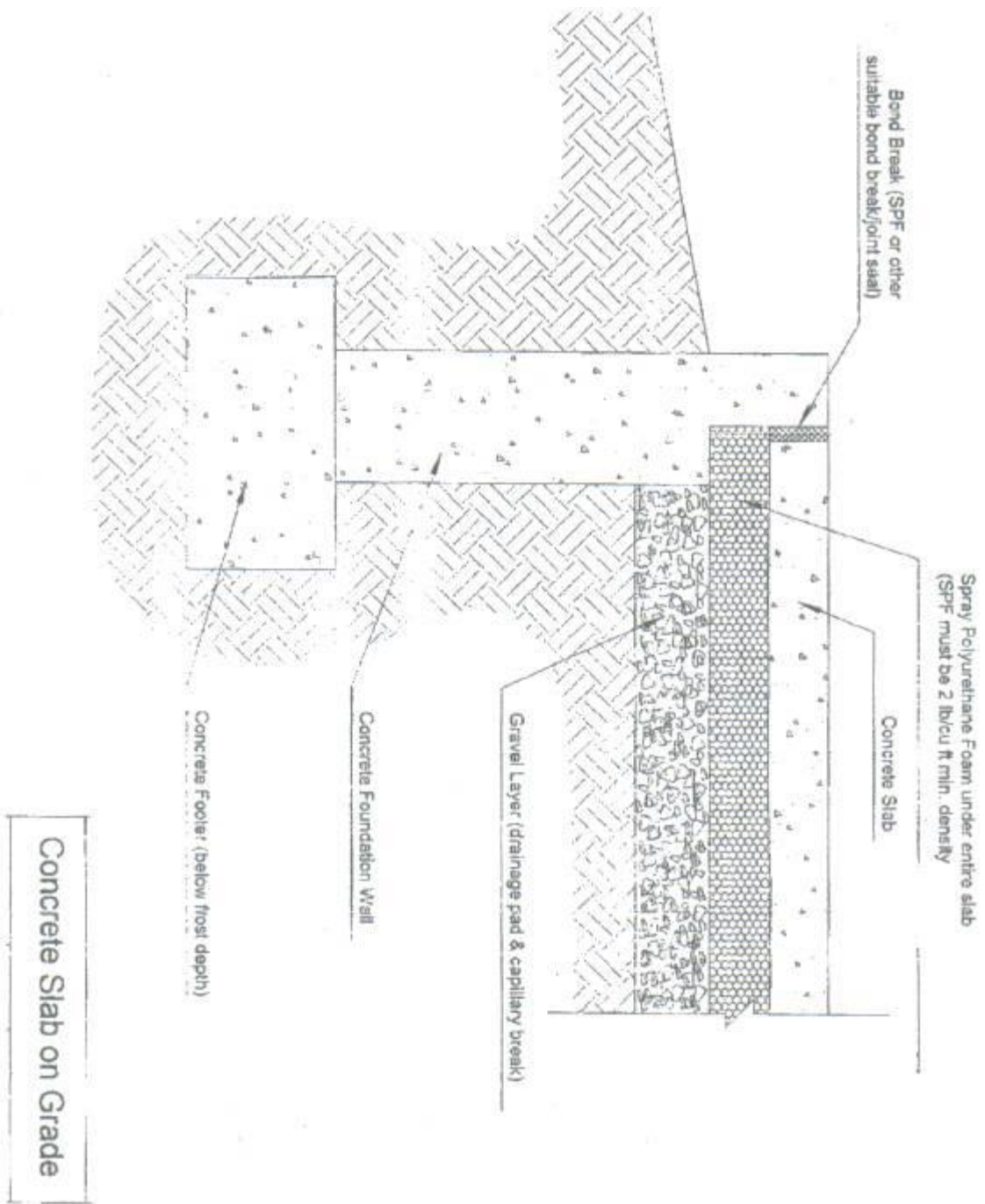
Cathedral Ceiling
 Non-Ventilable: Some shingle manufacturers may not warrant the shingles over a non-vented cathedral ceiling. Elk Premium shingles are warranted for this installation provided:

1. All structural roof work including decking/sheathing is in place and in compliance with local codes.
2. A waterproofing membrane is applied to the underside of the roof decking/sheathing and is in compliance with local codes.
3. Shingles are installed according to Elk recommendations as specified on the wrapper.
4. The Elk Corporation will not be responsible for any deficiencies or exposure of the roof deck, manufacturing defects in the fasteners resulting in their failure to perform under regular application of the Elk shingles.

Cathedral Ceiling
 Non-Vented



Finished Basement Wall with Offset Studs



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