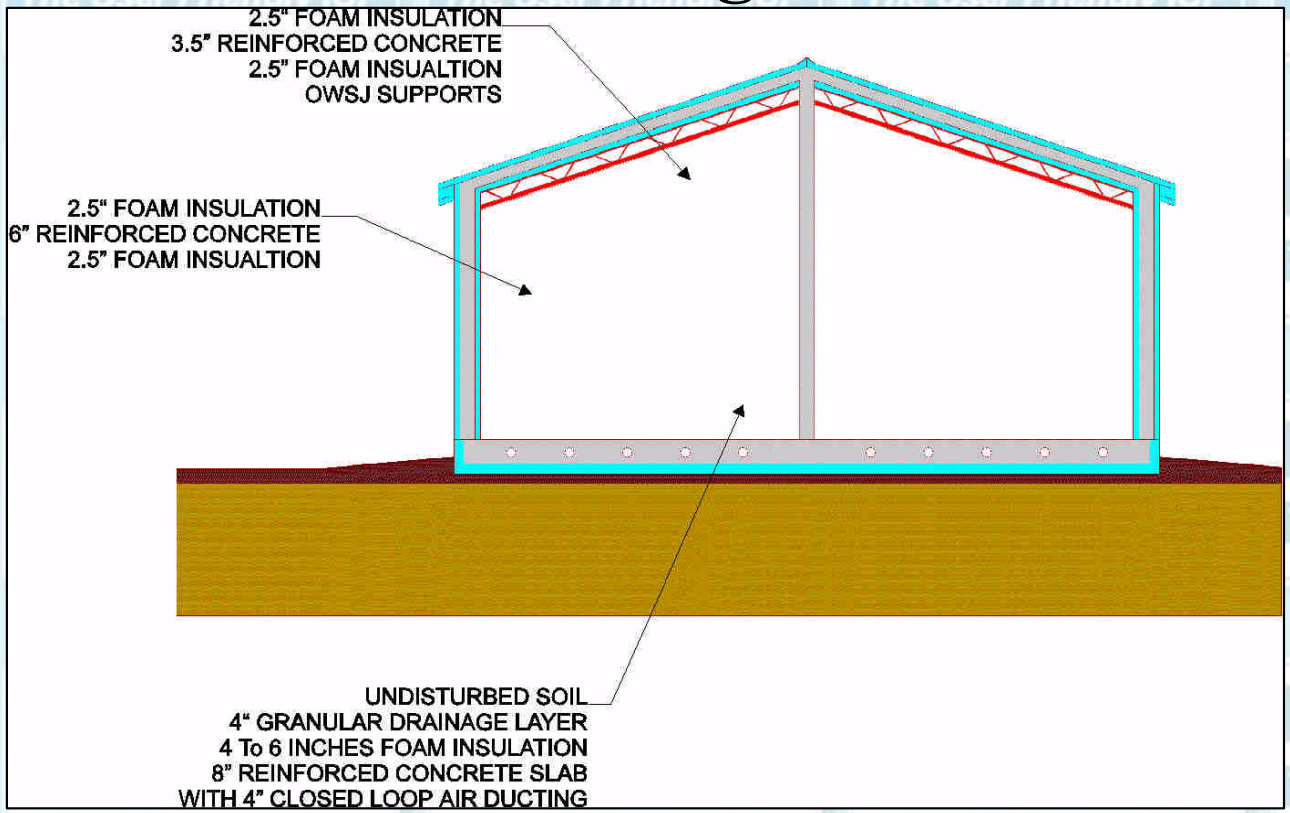
The Building Shell



Insulated Concrete Forming systems used for entire building envelope.

Higher R-Values **Increased Usable Life Span** **Environmentally Friendly**

Stronger **Disaster Resistant** **Non-degradable** **"Systems Approach"**

Readily Available **Non Combustible** **Ease of Use** **Non-Toxic**

Perfect Air and Vapor Seal **High STC Rating** **Resists Mold and Mildew**

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Insulated Slab On Grade

Insulated and Heated Thermal Mass Performs and Protects.

Structurally Superior	**Energy Efficient**
Reduced Cost	**More Comfortable**
Heat Buffering Capabilities	**Less Intrusive To Development**
Environmentally Friendly	**Effective Air/Vapor Barrier**
Fire Resistant	**Durable/Maintenance Free**
Code Acceptance	**Increased Accessibility**
Permafrost Uses	**Multi Story Capability**
Non Degradable	**Increased Structural Stability**

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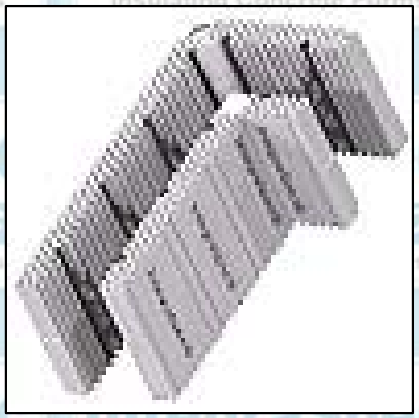
IntegraSpec® Reinforced Concrete Wall



Impenetrable and Effective.

- Structurally Superior
- Flexibility in Building Design
- Accepts any Finish Material
- Environmentally Friendly
- Non Degradable
- Code Acceptance
- No Mold or Mildew
- Durable/Maintenance Free
- Energy Efficient
- More Comfortable
- Stronger
- Shortened Construction Time
- Disaster Resistant
- Non Combustible
- Multi Story Capability
- Increased Air Quality

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Insulated Reinforced Concrete Roof

Beating Weather with Thermal Performance.

Structurally Superior	Energy Efficient
Standardized Design Charts	Sealed Envelope
Accepts any Finish Material	Acid Rain Resistance
Environmentally Friendly	Shortened Construction Time
Non Degradable	Disaster Resistant
No Venting Required	Non Combustible
Increased Interior Space	Increased Finish Life Span
Durable/Maintenance Free	Increased Air Quality

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Concrete Intermediate Floors

Thermal Mass and Superior Performance

- Structurally Superior
- Standardized Design
- Accepts any Finish Material
- Environmentally Friendly
- Non Degradable
- Rot Resistant
- Durable/Maintenance Free
- High Thermal Mass
- Increased Spans
- Lower Costs
- Shortened Construction Time
- Effective Radiant Panel
- Non Combustible
- Sound Proof

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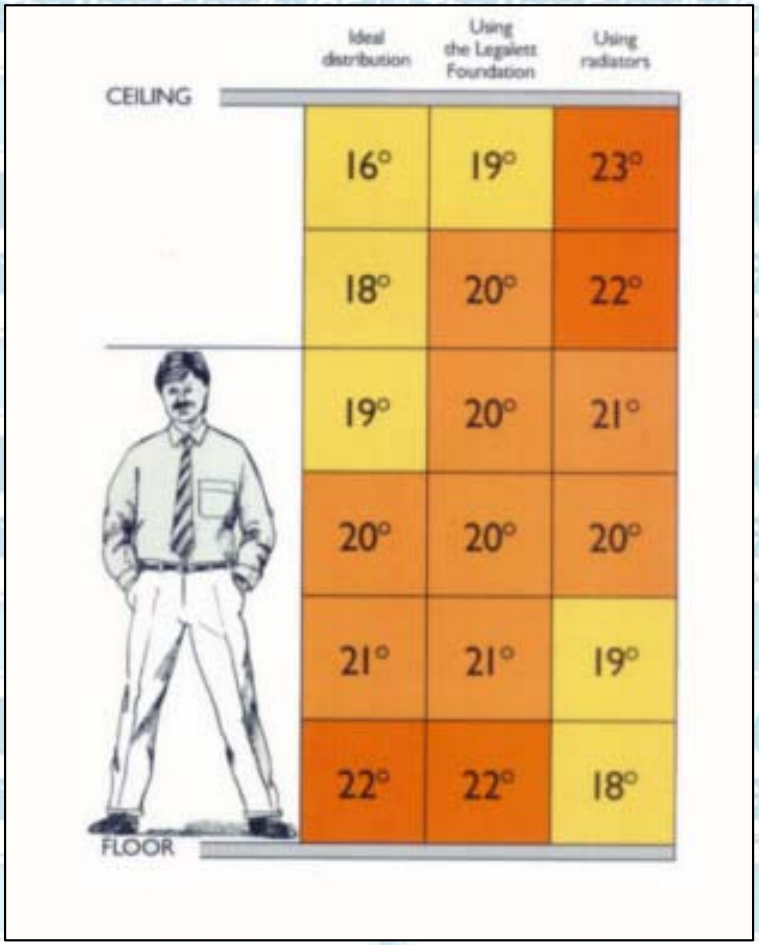
Radiant Heated Floors



Comfortable and Energy efficient

Lower Operating Costs

Ease of Installation

Design Simplicity

Reduces Mold and Mildew

Higher Comfort Levels

Market Acceptance

Readily Available

Shortened Construction Time

Durable

Effective Heat Transfer Medium

Adaptable to Technology

Non Combustible

Space Savings

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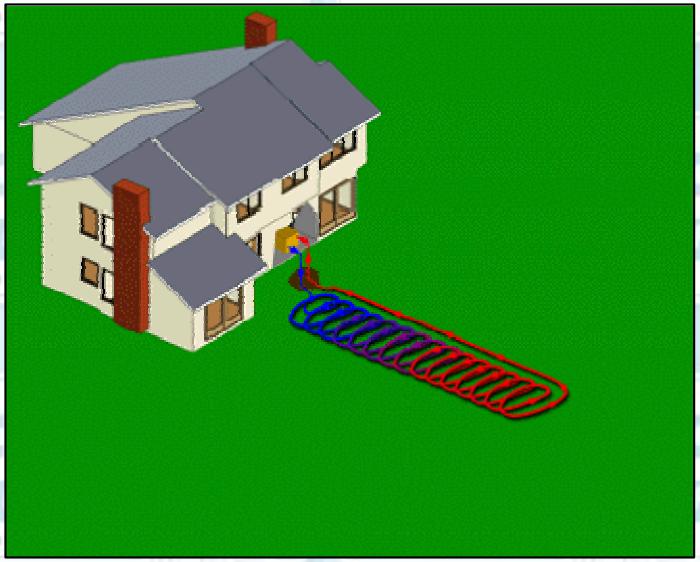
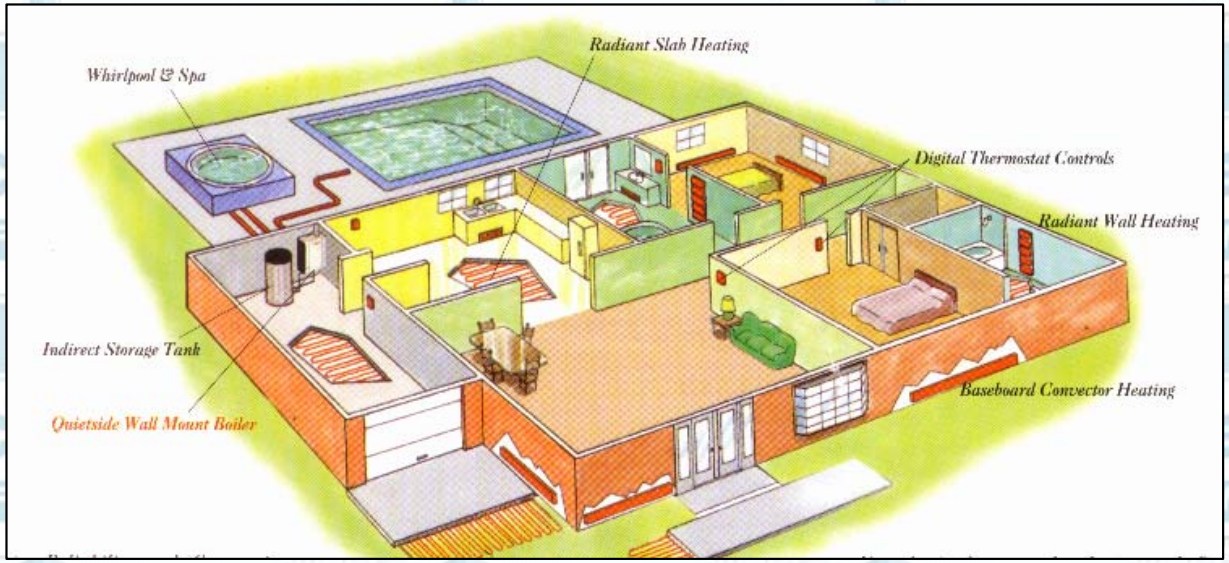
Geothermal Water to Water Heat Pump Systems





Increased Performance and Savings

- Lower Operating Costs
- Increased COP up to 10
- Hydronic Heating
- Hydronic Cooling
- Environmentally Friendly
- Lower Installation Costs
- Less Land Area Needed
- Smaller System Requirements
- Code Acceptance
- Effective Heat Transfer Medium
- Adaptable to Technology
- Market Acceptance
- Space Savings
- HVAC Design Flexibility

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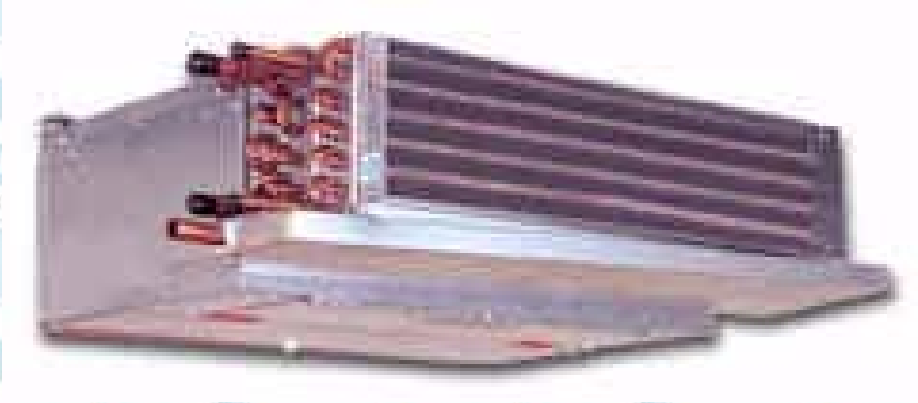
Air Cleaning, Air Re Circulation and Conditioning



Superior Indoor Air Quality

- Reduced Respiratory Effects
- Odors
- Human Comfort
- Cleaner Air
- Condensation
- Ease of Installation
- Low Volt 24 VDC system
- Even Temperatures
- Increased Quality of Life
- Higher Humidity Levels
- Lower Spore Counts
- Higher Oxygen Levels
- Automated Systems Design
- Continuous Re Circulation
- Reduced Cost
- Infinite Air Flow Control

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Building Total Concrete Homes Count

Costs Less Yet Gives A Lot More

Initial Mortgage Is Higher

Lowered Maintenance Costs

Added Cost Offset

Cleaner Indoor Air

Low Fire Potential

Quality of Life

Increased Human Comfort

Environment Friendly

Higher Appraised Value

Look and Feel

Energy Requirements Reduced

Reduced Insurance Rates

Safety and Security

Disaster Resistant

Sound Proof

Isolated Environment

Structural Resistance

Adaptable

Holds Building Value Long Term

Market Acceptance

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Why It Works

The Building Envelope and Energy Efficiency

Near Zero Air Infiltration: As the entire building envelope is cast in place, there are no joints to allow climate controlled air to enter or exit the building. This means that the large losses normally occurring in areas such as framed floor boxes, ceiling assembly penetrations such as pot lights or ductwork, simply do not exist. The exterior vapor and moisture seal is effectively continuous and uninterrupted.

Superior Insulation Values: Calculated R-Values mean little in comparison to true performance. FACT: ICF assemblies are up to three times higher in R-values than standard frame and batt construction. This means everywhere, walls roof and ceilings have much higher R-values than local code built construction.

Consistent Thermal Barrier: Unlike wood framed assemblies, the entire exterior of the building has a continual and unbroken insulating layer. This means no losses normally associated with thermal bridging (conductance) of heat through the wall assemblies.

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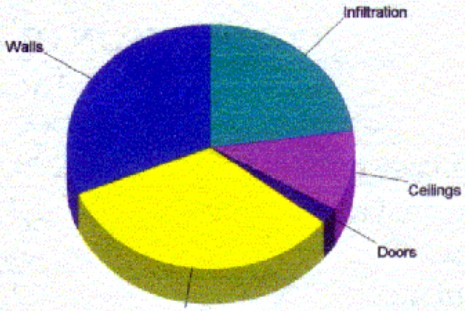
Why It Works
The Building Envelope Energy Performance

Overall Performance: **Testing completed on several total ICF structures has confirmed an overall reduction of up to 70% in heat loss, without any special design considerations such as solar gain orientation.**

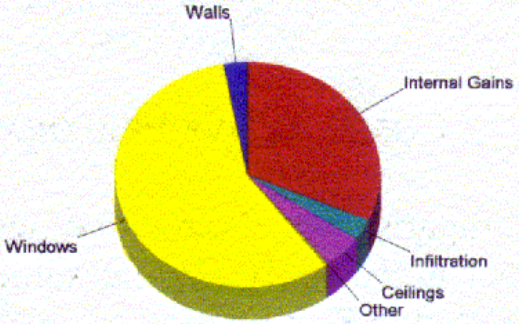
Heating

Component	Btuh/ft²	Btuh	% of load
Walls	1.6	4018	31.2
Windows	17.1	4265	33.2
Doors	12.3	259	2.0
Ceilings	0.6	1374	10.7
Floors	0.0	0	0.0
Infiltration	10.9	2942	22.9
Ducts		0	0.0
Total		**12858**	**100.0**



Cooling

Component	Btuh/ft²	Btuh	% of load
Walls	0.2	451	3.0
Windows	34.7	8662	57.0
Doors	2.8	58	0.4
Ceilings	0.3	740	4.9
Floors	0.0	0	0.0
Infiltration	1.7	473	3.1
Ducts		0	0.0
Internal gains		4800	31.6
Total		**15184**	**100.0**

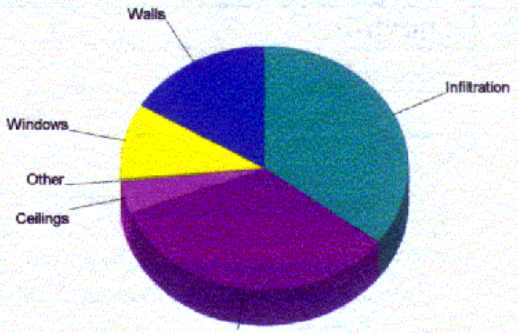


Why It Works
The Building Envelope Energy Performance

Compared to Wood Frame: **Many areas, including the entire State of Michigan, have shown that buildings of this type require more cooling than heating, which means that almost all of the US would then have to have buildings designed for cooling climates, instead of heating climates.**

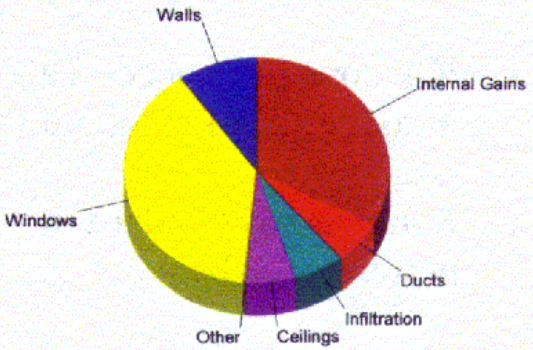
Heating

Component	Btuh/ft²	Btuh	% of load
Walls	3.9	9643	16.3
Windows	23.5	5855	9.9
Doors	12.3	259	0.4
Ceilings	1.0	2518	4.3
Floors	15.0	19802	33.6
Infiltration	77.4	20927	35.5
Ducts		0	0.0
Total		**59004**	**100.0**



Cooling

Component	Btuh/ft²	Btuh	% of load
Walls	0.9	2166	9.7
Windows	34.7	8662	38.7
Doors	2.8	58	0.3
Ceilings	0.6	1356	6.1
Floors	0.0	0	0.0
Infiltration	5.1	1368	6.1
Ducts		1405	6.3
Internal gains		7350	32.9
Total		**22366**	**100.0**



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Why It Works

The Building Envelope, Protection Far From The Norm.

Strength of the structure: Reinforced concrete is a known winner as one of the strongest, and longest lasting building products commonly used throughout the world. Typically, cast in place, Total Concrete Construction results in buildings which are 10 to 20 times stronger than other building methods. Standard Platform framing technologies consist of thousands of independent components fastened together by mechanical means, creating hinge points of weakness throughout the building. Cast in place concrete forms a continues and unbroken structural shell which is far stronger.

Natural Disasters and Social Unrest: Tornadoes, hurricanes, and Social Violence will not allow people to feel safe and secure in their own home. Current framed roof assemblies, even on reinforced concrete structures, have proven inadequate for supplying safety from occurrences of these types.

Why It Works

The Building Envelope, Water and Pesky Insects.

Water and Insects: All the components of an ICF building envelope are either resistant to moisture and/or unaffected by moisture. Areas such as toilet flanges, sill plates and such are naturally impervious to damage from water, simply due to the characteristics of the components of a concrete and ICF building. Furthermore, water penetration in the form of humidity and moisture is reduced or eliminated due to the near zero air movement through the ICF assemblies. Without moisture or rotting wood, (a key ingredient in attracting termites) ICFs tend to offer far less interest to insects like these. Primarily with a total concrete perimeter, insects are unable to "chew or burrow" their way into the indoor living environment. After all, 4"+ of concrete is a rather ominous obstacle to teeth, claws and pinchers.

Although riddled with infestation, This XPS does not provide food for termites.

Why It Works

The Building Envelope, To Burn or Not To Burn.

Non Combustible Construction: Reinforced Concrete has some of the highest fire ratings known in construction materials. Although many will argue the fact that EPS can and will burn, there is the question as to the volume of combustible products in a building. Wood frame homes simply add fuel to the fire, due to the nature of the materials, with large vented spaces and high flame spread ratings. Combined with an accelerated decline in structural performance during the duration of a building fire, fire fighters are often hurt or even killed when wood frame structures collapse prematurely. Additionally, fires progress through a concrete building at a much slower pace than that of wood frame construction. Finally, insurance companies have started to realize that after a fire, ICF buildings cost less to reconstruct, and protect contents better than frame.

Why It Works

The Building Envelope and the Indoor Living Environment

Controllable Environment: Concrete and ICF buildings provide a key element in control of the indoor environment and air quality. Never before has a building envelope been able to be constructed with such ease, and with near zero infiltration rates. This results in a building which can separate indoor and outdoor air volumes. Effectively, the building functions as a "plastic bag".

One of the benefits currently under research is the use of oxygen generators and airborne medications being distributed in this now controllable environment to increase the comfort of people suffering from terminal or temporary upper respiratory ailments.

Why It Works

The Building Envelope, Materials and Off Gassing

Low VOC/Inert Building Materials: **Concrete, Steel, and EPS foam; all these materials are commonly known to be inert and with almost no VOCs or off-gassing associated with them. Many people question EPS foam; however, think of this, EPS foam is FDA approved, it is used as filler for potted plants, cups for coffee, and included in several material specifications for hospitals, due to its inert characteristics.**

Why It Works

The Building Envelope, Molding a New Future

Lack of support for mold, mildew, and fungus: **Yet again, the base materials of Total Concrete Construction, do not provide any source of food or nutrients for plant or animal life. Although concrete does have a very limited volume of materials which could be utilized as nutrients for some molds, it is of such a limited amount that such organisms simply cannot survive on them. In almost all cases involving mold in concrete and ICF structures, it is the result of poor selection of finish materials, combined with a lack of proper indoor air distribution and control.**

Fact is…Wood Rots and Fiber Insulation is a Perfect Home for Mold and Mildew.

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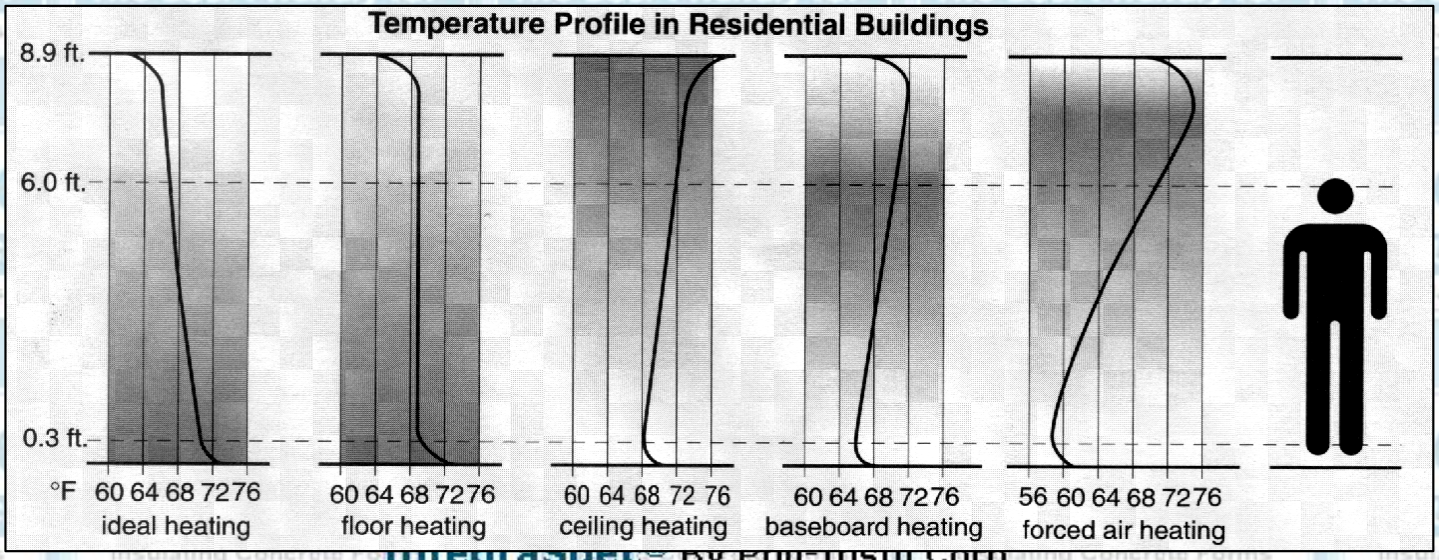
Why It Works

Radiant High Mass Floors, Taking Energy Efficiency Farther.

Heating and Energy Efficiency: Radiant heating is known to provide a minimum of 19% energy efficiencies simply due to the fact that mass bodies, such as people, absorb radiated heat more readily. Combined with the properties of high thermal mass and low heat loss/gains of the concrete building, Radiant systems need only supply a very limited number of BTU's/sq./ft/hr,(often as low as 1.2 BTU/sq./ft/hr).

Cooling and Energy Efficiency: Concrete has a very large thermal capacity, it can absorb tremendous amounts of heat energy for its volume. Radiant floors which have cooled water (no more than one or two degrees below room temperature running through them) effectively absorb heat from other mass objects. As the transfer is direct, passive cooling capabilities of cooled floors often account for up to 30% more efficient heat removal from the structure and its occupants. Floors cooled more than 2 degrees lower than indoor air temps, often suffer from humidity, mold and mildew problems, as well as feeling uncomfortable to the occupants.



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Why It Works

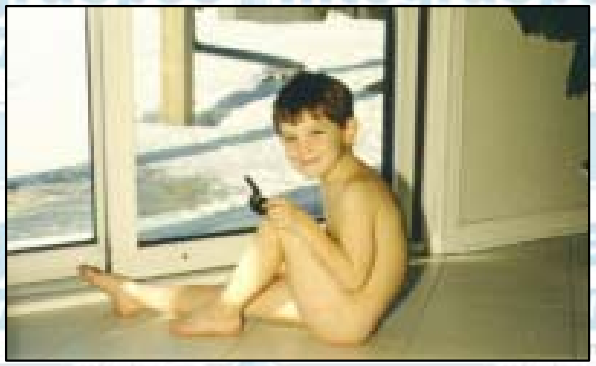
Radiant High Mass Floors, Combined Efficiency.

Saving Heating Dollars: This means further energy savings, as the water supply temperatures can now be lowered to operating temperatures of 79 degrees Fahrenheit or less. This means your heating equipment operates far more efficiently, especially when used in conjunction with Water to Water Geothermal Heat Pumps. Heat pumps can effectively derive COP's (co-efficient of performance) of up to 10.88 (COP is the relationship of energy input and heat output, i.e. Typical geothermal systems operate with a COP of 3, which means for every dollar you spend on energy to operate the system, you get three dollars of heat energy out of it) This means you get around 230% more heat pumped per dollar, rather than the 60% currently touted by the geothermal industry.

Saving Cooling Dollars: This translates to further energy savings, as returning hydronic temperatures of 70 degrees Fahrenheit, as opposed to 90+ allow heat pumps to operate very efficiently. When used in conjunction with Water to Water Geothermal Heat Pumps, EER ratings of 26.23 are quite achievable.

Why It Works

Radiant High Mass Floors. In Cooling Climates???

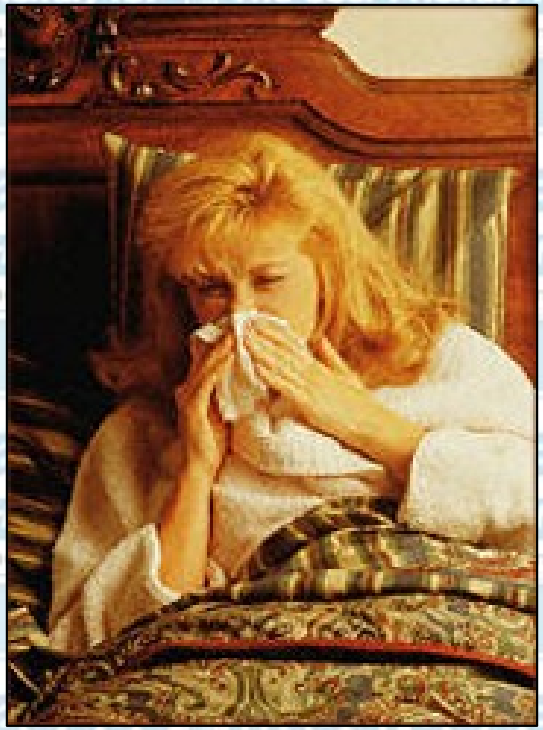


Heating the Floor During the Cooling Seasons: More often than not, Concrete floors are much cooler, often uncomfortably cold, even in areas such as Northern Florida, Texas and a good portion of California. So why heat your floors in cooling climates, why not just put on an extra pair of socks? Mainly to control mold and mildew by tempering the floor and not allowing "relative humidity" levels to climb near the floor surface, which will encourage their growth. By utilizing a balanced, and comfortably raised temperature in the slab, relative humidity levels can be maintained at the concrete surface, and the floors are no longer cold to the touch each morning.

Why It Works

Radiant High Mass Floors And Indoor Air Quality.

What Can Happen: Many Slab on Grade homes built in southern climates often have winter floor temperatures of about 55 degrees. With indoor air temperatures of about 70 degrees. As humidity is inversely relative to air temperature, the lower the temperature the higher the relative humidity level. Even with an ERV maintaining the 70 Degree indoor air at 60% relative humidity, areas of the floor, especially those with carpeting and under pads, will very often exceed 100% at the surface of the concrete. This means that mold and mildew has not only an ideal food source (carpet or pad fibers), but also the ideal temperatures and humidity levels to propagate at a very rapid pace. This then extends up walls and into clothes, which your teenager has carelessly piled on the floor. Subsequently, as the molds and mildews reproduce, spores are kicked up as occupants move about, and are transferred throughout the building, to further spread into other materials. Worst of all, into the HVAC system as well. Many people are aware of the problems associated with Sick Building Syndrome and the Schools of America. I have seen in several investigations, schools with carpeting in the areas where children take off shoes and coats. The Carpet is there to provide comfort to the students as they take off their outerwear, however, these areas tend to have high mold and mildew counts as students carry in snow or their raincoats drop free water which is absorbed by the carpeting. Radiant floors at balanced temperatures allow this free water to evaporate and be carried away at a much higher rate.



Why It Works

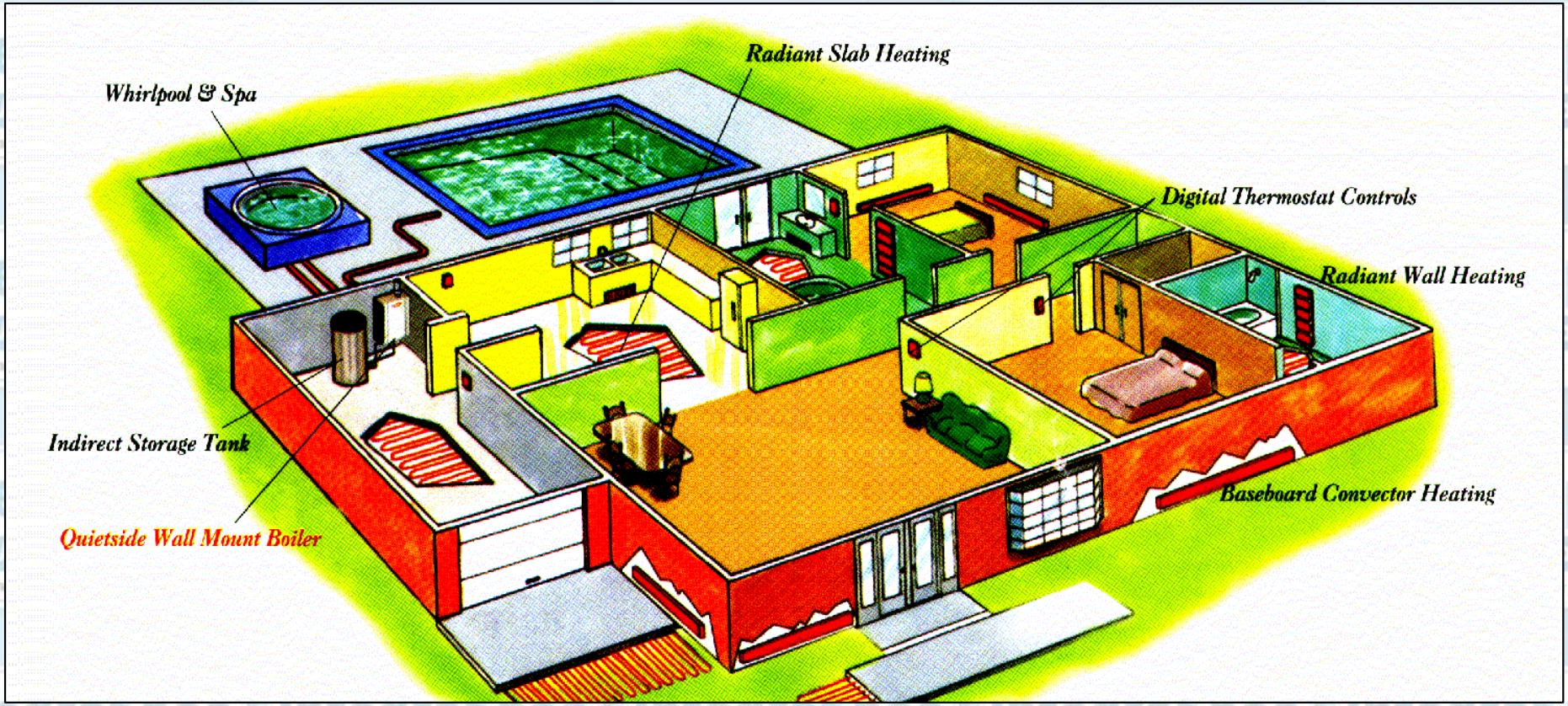
Geothermal Heating Works Best with Concrete.

Increasing COPs and EER Ratings: **A geothermal heat pump can have much higher efficiencies than those that are an accepted standard today. By lowering the heat gain/loss and introducing High Mass Thermal Storage, systems don't need to be as large, so pumps are downsized offering significant energy savings. This would be true with any geothermal system and the reduction would fall in the 60% industry standard energy saving advertising….However!!!**

Why It Works

Geothermal Heating, The Hydronic Connection.

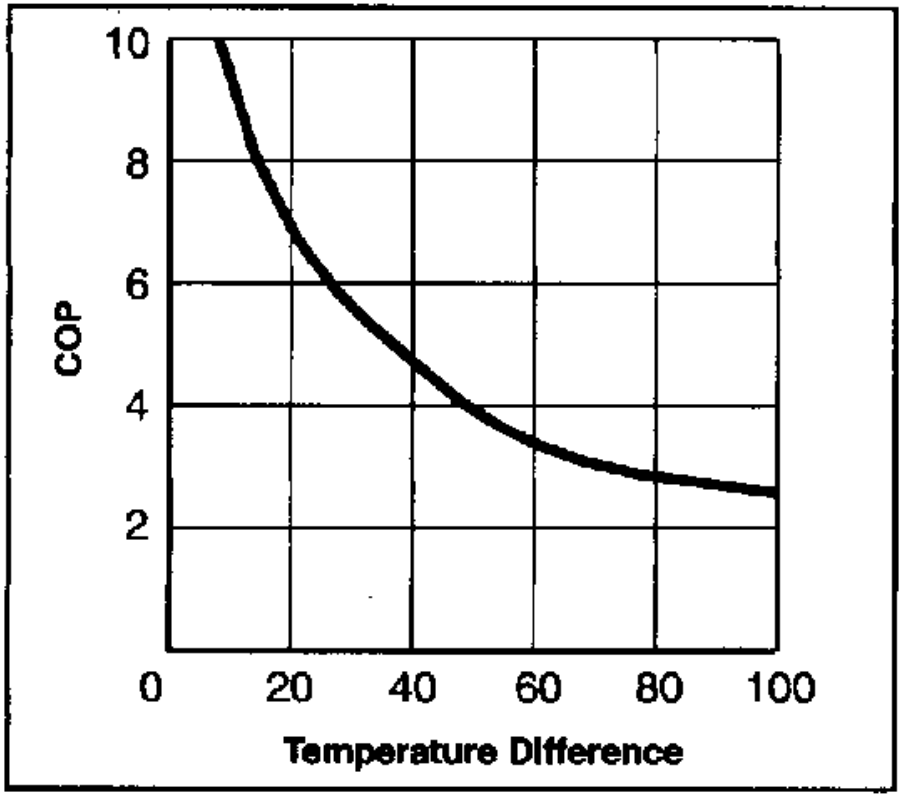
Water to Water Heat Pumps: Something as simple as using Water to Water Heat Pumps allow heat to transfer more efficiently, as the fluids have identical characteristics and densities. In short, it is easier to transfer BTU per BTU in denser fluids than lighter fluids such as air. Typically, this is due to the lower temperature difference, or pressure required, to effectively transfer the same volume of heat energy.



Why It Works

Geothermal Heating, Volumes Speak Louder Than Dollars.

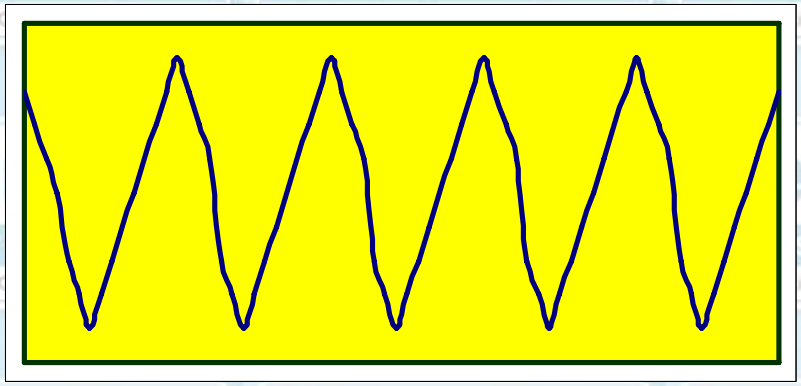
High Volume as opposed to High Temps: **Think of a heat pump, like a water pump in a well. The deeper the well, the more energy required to move the same volume of water to the surface. Heat pumps work in much the same way, the higher the temperature rise requirements (verses the vertical pumping distance) the more energy required to move the same volume of heat. In short, if the heat pump has to increase water temperature from 55 degrees to 130 degrees, it will provide a lower volume or total BTU heat output, than if the heat pump had to increase water temperature from 68 degrees to 79 degrees.**



Why It Works

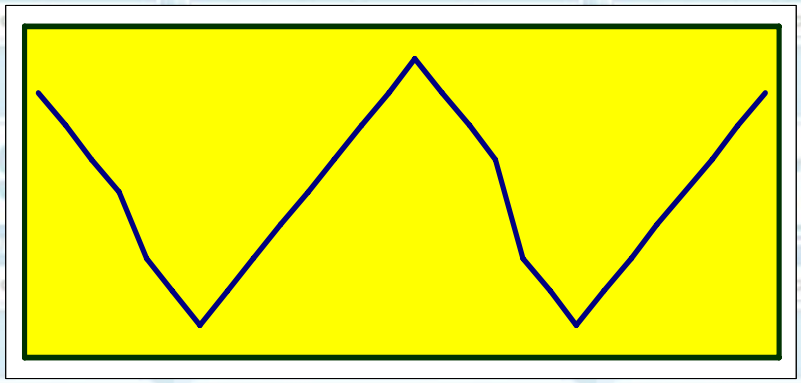
Geothermal Heating, Standard Efficiencies Do Not Equate.

But How Usable Is This Small Amount Of Heat: **Remembering that our heating requirements (per square foot) is very low, we don't need a lot of heat all at once. Using the thermal storage of High Mass structures, Geothermal units are forced to run longer (heat pumps use 35 minutes of energy in the first 5 minutes to warm up), yet less often, and the thermal mass takes a long time to store this heat, which is given off at a far lower rate than standard frame buildings. Current tests are proving that Geothermal heat pumps with High Mass Concrete Structures, can easily consume 260% less energy THAN OTHER STANDARD GEOTHERMAL INSTALLATIONS IN WOOD FRAME BUILDINGS.**



Typical 24 hour HVAC operating cycle for wood frame building.

Units run more often for shorter durations.



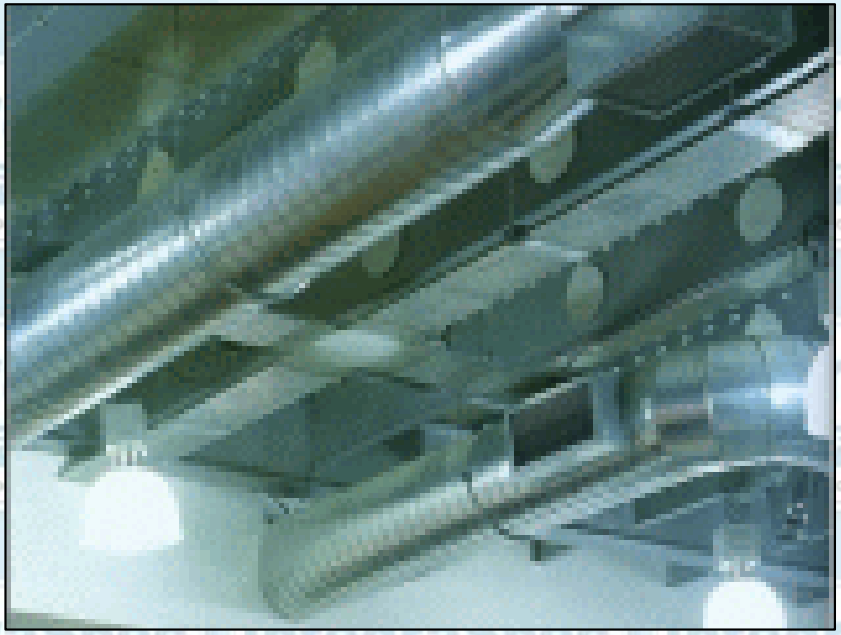
Typical 24 hour HVAC operating cycle for Total Concrete building.

Units run less often for Longer durations, Ideal for Efficient Heat Pump Operation.

Why It Works

Air Handling Systems, To Force an Issue...Why the change???

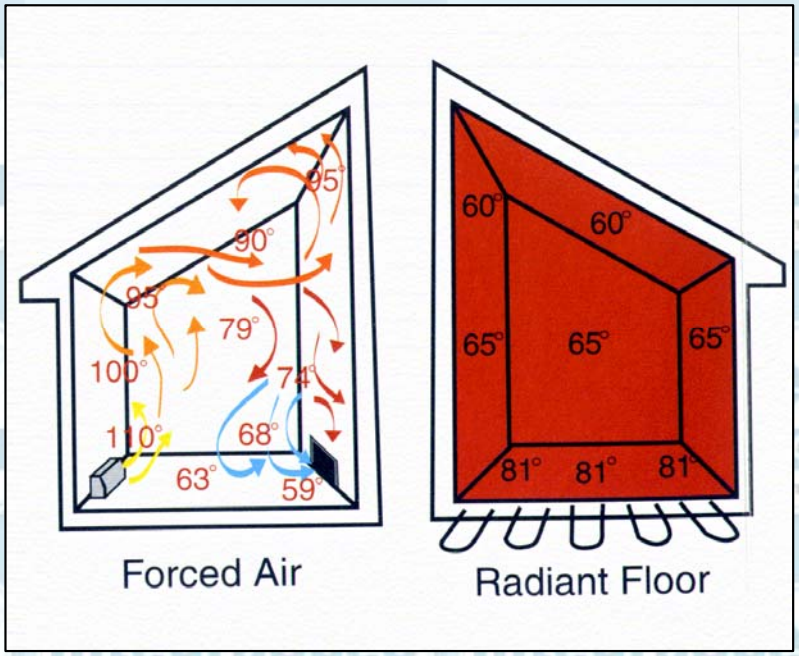
Forced Air Systems With Central Returns: Suddenly the designs associated with forced air central return systems simply do not work as well. Issues arise such as increased localized humidity and temperature differentials, poor indoor air quality and elevated dust levels are typical of the problems associated with these types of "standard" installations in Total Concrete Buildings. With the downsizing of systems, often adequate air flow and air change requirements are not met. The standard systems are designed to strictly distribute sufficient heating or cooling to the building, and no consideration is given for overall ventilation factors. Continuous operation and zoned re circulation systems, HRV/ERV and air change technologies become vital to the success of an efficient design.



Why It Works

Air Handling Systems, Stacked Up To Temperature.

Enhanced Stack Effect: Due to the requirement for less air flow to transfer heated and cooled air, as well as the near zero infiltration rates, the indoor air is not moving sufficiently to balance temperatures more evenly. Heat rises, this is a fact, and often two story total concrete homes, end up with much higher temperatures at the uppermost thermal envelope barrier (now the roof assembly). Compared to lower levels, this temperature difference can easily be 10 degrees, even with the air handler fans running continuously. As the heated air cannot escape from the roof, we now have, in effect, a Hot Air Balloon. When you consider the weight a hot air balloon can lift, you start to appreciate the pressure on the ceiling envelope in homes. As standard homes have holes in the ceiling assemblies and any vapor barriers which may have been installed, the "balloon effect" is lessened as this heat energy can escape. In a Total ICF building envelope, this does not happen. The result is a need to move the heated air back down to the lower levels, and with a central return, this simply does not occur as returns are typically installed at floor level.



Why It Works

Air Handling Systems, Humidity Builds Mold.

Localized Elevated Humidity/Contaminant Levels: Much like a slab on grade, relative humidity levels can vary significantly in ICF building envelopes, usually on a room by room basis. Smaller spaces such as closets, bath and laundry rooms, tend to have elevated humidity levels, and exterior windows or wall areas have proven to show a progressive rise in humidity that radiates from the center of the home. Contaminants such as cleaners and paints stored in utility rooms, or propane and natural gas released into the indoor environment from stoves or such, can and do elevate related contaminants at either the ceiling or floors. This is due to the fact that all fluids vary in weight ratios; Natural gasses rise, Propane gasses and paint fumes tend to settle. With the reduced air flow requirements (due to smaller heating/cooling equipment) and lack of sufficient return air movement, elevated humidity and contaminant areas are not dispersed enough to reduce these congestions.

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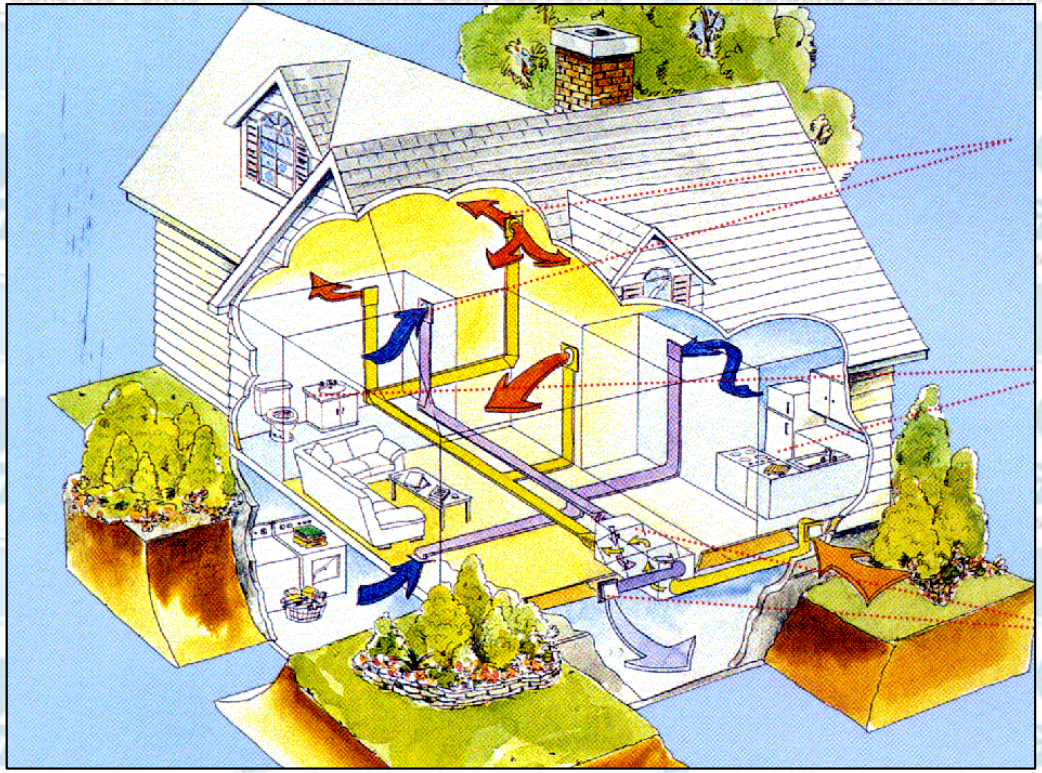
Why It Works

Air Handling Systems, Constant Recirculating is Important.

Moving Air Evens out Temperature and Contaminant Levels: Have you ever been in a home or apartment cooled with a window air conditioner? Its amazing how cool that room is, however without proper air re circulation of the conditioned air to the remaining rooms, the temperatures throughout the building are not the same. This is also true for the unseen humidity and contaminant concentrations in the air. Recirculating air balances temperatures and contaminants throughout the building. Recirculating systems in a Total ICF envelope home should include a supply grill over every exterior window or door opening, and return grills located in each room at the farthest entry opening from the supply grills, AND in every closet or confined space. Each of the individual "Zones" should be coupled with Passover lines or returned to a central unit to allow for intermixing of the entire indoor air volume.



Why It Works

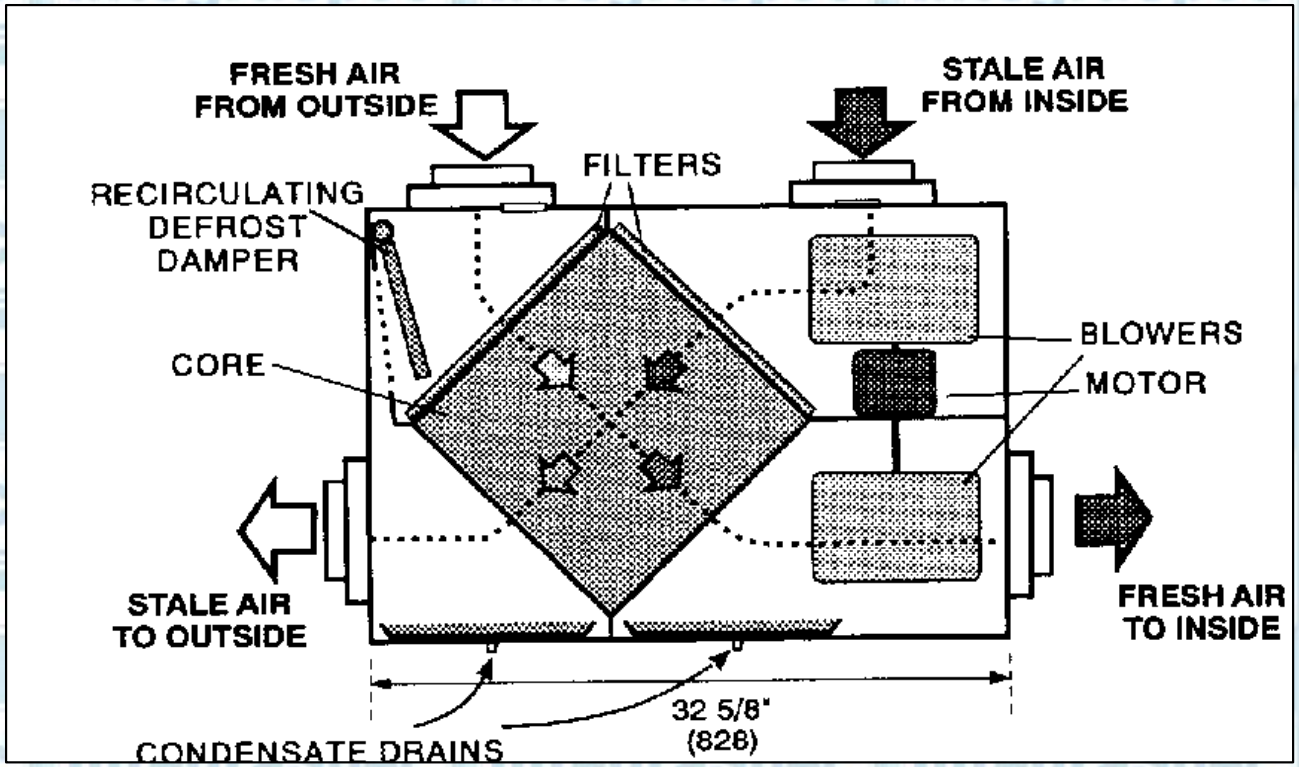
Air Handling Systems, Air Exchange Saves Lives.

The Importance of Air Exchange: In Total ICF envelopes, please remember that the air infiltration rate is near zero. Effectively the indoor environment is sealed from the outdoor environment. As we breath, we use up the oxygen in this enclosed space, much like living in a sealed plastic bag. Reality dictates that only a limited amount of oxygen is available, and eventually we will suffocate. Now don't be alarmed, there is an easy solution to the problem. Air Exchange. By exchanging fresh outside air with stale inside air, through the use of air exchangers, we can easily provide more than enough fresh air for you and your entire family. I have also had the question posed, "what about power outages?". It takes a long time to use up the volume of Oxygen, within your home, typically about 36 hours or so. If long power outages occur, it's a good idea to open opposing windows, to allow for passive air exchange every 12 hours, to prevent such a possibility.

Why It Works

Air Handling Systems, Air Exchange, ERVs and HRVs.

When Heat Loss Counts: As a basic, human requirement, a fully sealed environment requires about .1 air changes per hour based on equivalent air volumes in modern housing, to prevent suffocation or high Carbon Dioxide levels. Code requirements dictate a much higher .3 air changes per hour on average. As the primary heat loss of a total ICF building is the air infiltration, lessening the effect of heat loss/gains is very important. Utilizing HRV/ERV technology can effectively get back up to 70% of this direct loss.



Why It Works

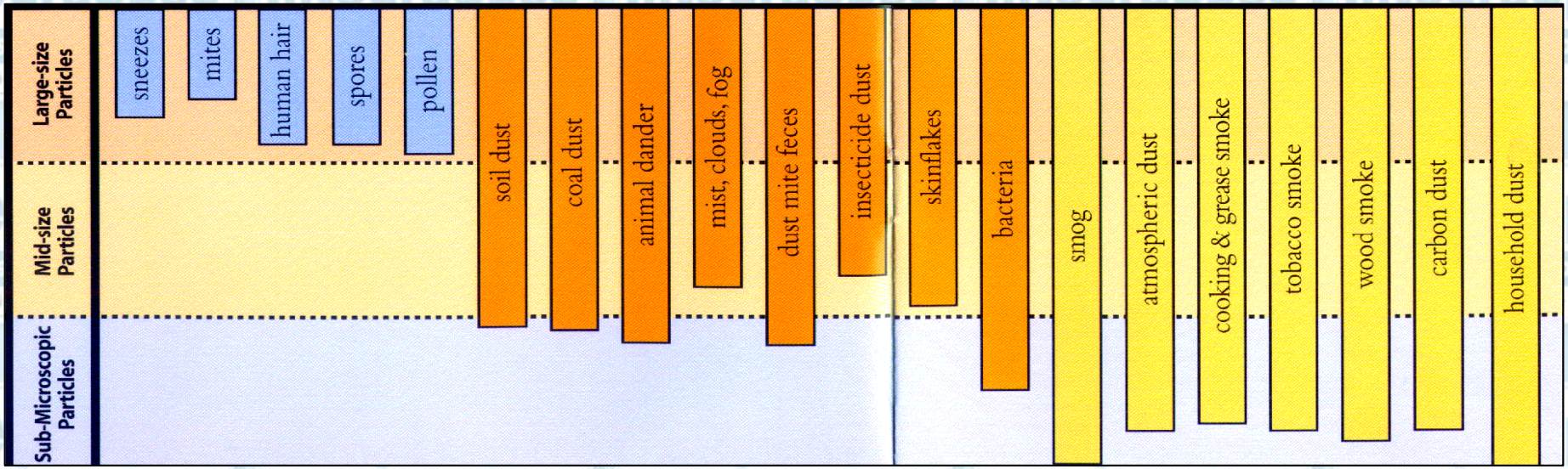
Air Handling Systems, "What… Increase Humidity! What About Mold!!!."

Humidity and Our Health: **HRV/ERV technology is utilized to control humidity as well, and almost all installations include humidistats which are owner controlled, to help prevent mold and mildew problems by reducing indoor humidity levels. In wood frame homes, manufacturers typically recommend a humidity level of about 35%. Doctors recommend a humidity level of a minimum of 37%, as the protective mucus lining in our lungs will dry out, causing severe upper respiratory problems. Total Concrete Construction can allow us to have humidity levels of 60% plus, which is much closer to the ideal doctor recommended 80% relative humidity levels to ensure your health. This is only achievable due to the nature of the building materials and the recirculating air handling approach in this presentation.**

Why It Works

Air Handling Systems, Air Cleaning and IAQ.

Controlling our Environment: **Advanced technologies, such as Electronic Air cleaners, Turbulent Flow Precipitators and HEPA filters, allow us to rid the air of harmful particulate as small as .18 microns. The biggest problem in frame construction is that there is so much air being lost through the building envelope, that contaminated make up air is entering at all times from the outside. We can filter a fair amount out of a wood frame home; however, with the sealed envelope of ICF, we now can isolate our cleaned air far better, meaning lower particulate counts and less contaminated air to clean. Combined with any air exchange, and passover venting, these particulates can be constantly "plucked" from the air. As well, there is a distinct barrier between the indoor and outdoor environments. We can now create a much higher IAQ, because we have better control over the variables. Combined with advanced sensors which increase or decrease air re circulation volumes, we can keep contaminants such as Formaldehyde, Carbon Dioxide, Dust, Pollens, even Odors, to a defined level. This reduces air change, simply because the air is being constantly monitored, and when air cleaning is not providing the air quality to our specifications, this is when new air is brought in, cleaned, and distributed throughout the home.**



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Costs

Total Concrete Costs… A Lot More.

The True Cost of Building ICF and Concrete Structures: **Sit down when you hear this, Concrete construction typically runs about 10%to 30% more, depending on the labor/materials used, design and localized costs. The overall question is….Is it worth it?**

TABLE 11
COST TO UPGRADE WOOD-FRAME WALL PERFORMANCE[1]

PERFORMANCE CHARACTERISTIC	PERCENTAGE OF COST DIFFERENCE BETWEEN ICF AND STANDARD WOOD CONSTRUCTION
Safety & Hazard Mitigation	50% or more
Fire Resistance	Not considered practical to upgrade
Energy Efficiency	33%
Durability	15%
Sound Control	20%
TOTAL	118%

Notes:
1. Table values are based on data presented within the report.
2. Cost difference between ICF and standard wood construction is found in Tables 1 and 2. This difference is about $3.99 per square foot of floor area, $3.47 per square foot of gross wall area, or about $7,000 for a typical 1,800 sq ft house plan costing an average $208,000.

Costs

Total Concrete Costs. Is It Worth It?

ICF Construction And The Market: **Many people look at the added costs and then speak to their lending institutions to determine their building potential. Most lending institutions and appraisers DO NOT RECOGNIZE THE VALUE OF TOTAL CONCRETE CONSTRUCITON. The few accurate appraisals, which take into account the quality and durability, as well as the benefits of this type of construction, typically appraise these buildings about 20% over the ACTUAL CONSTRUCTION COSTS FOR OWNERS. This means you have a home, you will move into, with a higher asset value than you paid for it. The key to accurate appraisals is to educate the appraiser. Often this requires not only an initial appraisal, but a final site appraisal, after the building is completed.**

TABLE 10
COMPARISON OF RELATIVE PERFORMANCE

PERFORMANCE CHARACTERISTIC	ABOVE-GRADE WALL CONSTRUCTION TYPE	
	Concrete (ICF)	Wood-Frame
Safety and Damage Prevention	Excellent	Adequate to Good
Energy Efficiency	Excellent	Adequate to Excellent
Fire Resistance	Excellent	Adequate
Durability	Excellent	Adequate
Sound Control	Excellent	Adequate to Good

Costs

Total Concrete Costs. Mortgage Payments Increase?

Added Principle Means Added Interest: **Be prepared to have your bank state that you do not have the ability to take on the additional monthly mortgage amount. Many owners look at this and become dismayed, they simply cannot build the home they want and switch back to wood frame. BUT WAIT….What about the 80%-90% reduction in energy bills, or savings in insurance premiums, or the lowered maintenance costs. Sometimes its important to advise your bank of the inner workings of a Concrete Home. The Fact that YOUR home will have a much higher resale value, and will hold that value for a longer period of time.**

Costs

TOTAL CONCRETE COSTS LESS?

Yes it truly does: **The reality of the logistics of operating a home and meeting mortgage payments proves that ICF construction costs less, meaning shorter mortgages or more free capitol in your pocket each month.**

Summary initial cost:

Wood frame construction costs: $150,000.00, **Net worth of building $150,000.00**

Total concrete construction costs: $165.000.00, **Net worth of building $195,000.00**

Summary Mortgage Payment:

***Mortgage Payments for each assuming 20% down. Over 30 years. At 7.5%.

Wood Frame construction: $839.06 Total Concrete construction: $922.96

Summary Basic Operating Costs: Monthly

Wood frame insurance costs: $38.35 Total Concrete insurance costs: $26.85

Wood Frame heating/cooling: $134.26 Total Concrete heating/Cooling: $16.37

Summary Maintenance costs: average for 25 years per month

***Michigan State University Study on Long Term Maintenance for ICF Construction

Wood Frame maintenance costs: $238.97 Total Concrete maintenance costs: $58.95

Wood frame home: **$1,250.64** Total Concrete Home: **$1,042.13**

That's over $200.00 per month of freed up income.

So in short, you pay less, and get more.

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Summary

Why build Total Concrete and ICF buildings?

The true benefits are all WIN WIN: What people need to have is an education in how it all works together, too many people look at the initial cost/square foot and don't realize what they truly can have.

Costs

Safer

Stronger

Quieter

Durable

Environmentally Friendly

Healthier

Uses less energy

Higher market value

Low Maintenance

More comfortable

Look and Feel of Quality Building

Longer service life for Mechanical Equipment

Permanent

Easier/Faster Construction

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Summary

Committing to Total Concrete Construction?

Half Way Simply Does Not Work: **Like anything else, doing "part" of the job or partial commitment does not provide the benefits of this scale. Safety, Insurance and Energy Savings decrease dramatically without the use of Total Concrete as a building system. Like a bike with no pedals, you can coast easily, however the real power of use comes from a complete and whole commitment to a better building system.**

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