DOME LIVING

David B. South with Freda Parker

What You Need to Know About a Monolithic Dome Home — Before You Buy One

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By David B. South with Freda Parker

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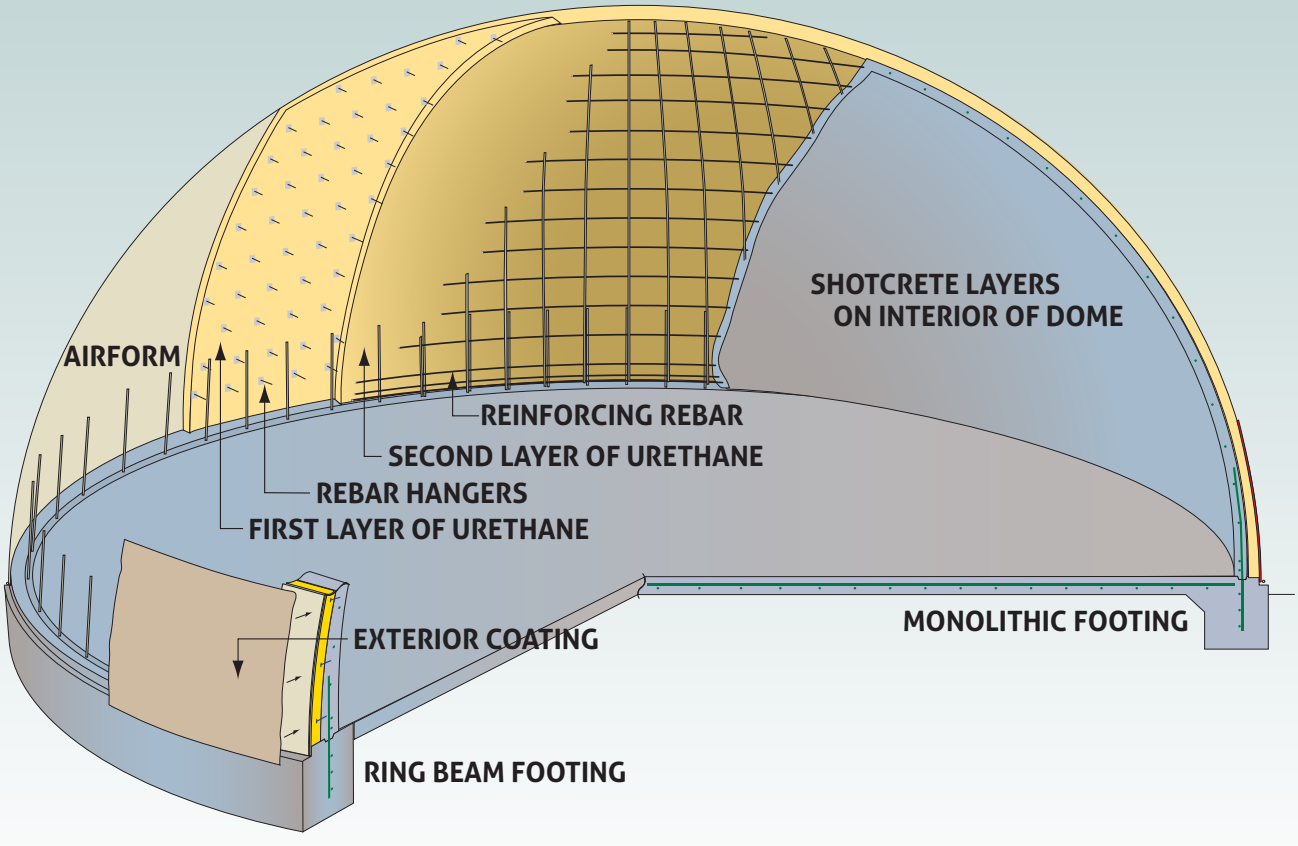

The Monolithic Dome

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Jack Boyt, now retired, was an early, ardent supporter of dome construction. He played a significant role in the development of Monolithic Airform technology.

Foreword

In 1978 a man came into my tarp repair and custom sewing shop in Des Moines, Iowa and asked if I could repair his tarp. That turned out to be a life-changing event for me.

That man was David South and his tarp was an Airform that had split during inflation.

While the tarp was being repaired, David explained how he was developing a new process that made it possible to quickly and economically build thin shell concrete buildings.

As a result of that meeting, Precision Air Structures was born and became a major supplier of Airforms and David South and I became life-long friends.

Shortly after that tarp repair, I worked with David and a number of dome constructors. Each had a somewhat different process, but all involved an inflatable fabric form for houses, storage buildings, churches and special buildings.

David has been a major builder of dome buildings as well as the promoter of

training classes that teach others how to build dome buildings. This has resulted in a number of qualified builders in the USA and around the world.

David is driven by a passion to build energy-efficient structures, which are strong and long lasting, using universally available common materials. He also has a passion for developing the necessary building technology and teaching others how to adapt it to conditions worldwide.

David has persevered in the almost impossible task of breaking long-established architectural and engineering practices, that persisted despite an obvious need for improvements.

He has shown how schools, churches and other buildings can pay for themselves with energy savings and have the added advantage of safety and comfort.

Monolithic Domes have survived hurricanes, tornadoes and fires without structural damage, when their neighbors were destroyed.

I am pleased that you have shown an interest in reading this book. It will prove to be a window to buildings of the 21st Century that answers many of the inevitable challenges facing our world in the years to come.

Jack Boyt
Airform pioneer

David B. South

Preface

Here's a book written especially for people thinking about planning a Monolithic Dome dream home but concerned about the answers they don't have.

I meet people in that situation just about everyday. Most have heard something about Monolithic Dome homes that piques their interest. But that *something* may be very different from what they know about run-of-the-mill American housing.

So they feel confused. They have questions — lots of questions.

Well, the answers are in ***Dome Living: What You Need to Know About a Monolithic Dome Home — Before You Buy One***.

We know that our technology differs significantly from traditional home construction. So we worked hard to make this book reader-friendly, particularly in:

- describing the Monolithic construction process
- highlighting the benefits of a Monolithic Dome
- defining legal procedures home planners must complete
- presenting exterior and interior home decorating ideas

In addition to the text, this book includes photos of Monolithic Dome dream homes, many of which were contributed by their happy owners.

And there are about **136 idea-generating Floor Plans!**

Please note: In describing individual Monolithic Dome homes, we often included a measurement, such as 50' x 25'. That translates into 50-foot diameter by 25-foot height.

The dome-home may also have a special name; if so, we present it in quotation marks: "Cliffdome."

Unless otherwise specified, all domes pictured are Monolithic Domes.

Monolithic®, Airform®, EcoShell®, Crenosphere® and the ***domearc logo*** are all registered trademarks of Monolithic Constructors, Inc. A lawyer writing this book would probably put ® symbols beside every mention of these names, but we think that is too reader-distracting. Instead, we declare these trademarks here and hereafter only capitalize the words to set them apart as registered trademarks.

We hope you enjoy this book and find it useful. And, of course, we also hope it will provide you with the answers and information you've been seeking and get you planning your Monolithic Dome dream home.

David B. South, President
Monolithic Dome Institute

Acknowledgements

I believe that — more than anyone else — I know how much thought, planning, frustration, time, and good old, nose-to-the-grindstone work went into this book.

Actually, it took every person in every department at Monolithic to create the kind of physical and emotional environment that makes a complex project like our ebook a reality.

There's no doubt — a dedicated family of cooperative individuals made this project possible.

I know because I heard their extremely helpful suggestions, witnessed their expertise, and watched their slow but determined progress. And I thank each:

Dave South, Jr. for initiating the idea of an ebook that would give dream-home planners the information they needed to make wise decisions and for expertly handling all the technical, electronic and computer issues involved in publishing an ebook.

Freda Parker for organizing our first *working copy* and reorganizing and editing

the many copies that followed.

Carol Cirulli Lanham for her reviews of the text and her suggestions for its improvement.

Larry Byrne for organizing and making available the many Monolithic Dome, dream-home floor plans in this book.

Mike South, Melinda South for their thoughtful readings, critiques and corrections of the evolving versions of the text.

Melinda South, Kelly Lewis for carefully reviewing, identifying and organizing the art work.

Our Monolithic Dome home owners for contributing splendid, color photos of their beautiful, dream homes. They and their contributions are listed on page 323.

Our Monolithic employees who run our office, provide customer service, manage our websites, work in our Airform factory, and keep our sprawling facility clean and neat.

Thank you one and all,
David B. South

This dream home in Mesa, AZ is 54' x 23' with 2900 sq ft. The downstairs includes living/dining area, kitchen, three bedrooms, two bathrooms, utility room and shop. The loft includes den, office and half-bath.

chapter one

About Monolithic and About This Book

Let me tell you a little more about Monolithic, our company. It all began, quite by accident, in 1956 when I heard Buckminster Fuller talk about domes. I was still in high school then, but my fascination with dome structures took root.

During the twenty-some years that followed, my brothers and I kept researching and experimenting with various construction methods, and in 1976 we built our first Monolithic Dome.

In 1979, the U.S. Patent Department granted me a patent for the Monolithic Dome construction method. Since then, thousands of Monolithic Domes have been built worldwide.

Monolithic is headquartered in Italy, Texas, a rural community about 30 miles south of Dallas, just off I35E. Our complex includes three, interconnected Monolithic Dome offices, a training center, a Visitors Center, an Airform factory, a cluster of dome rental units and several both large and small dome homes.

These days Monolithic is a family of companies sharing the same goal. We are dedicated to improving people's lives worldwide by introducing and constructing Monolithic Domes, for personal and public use, that are disaster-resistant, energy-efficient and cost-effective.

The Monolithic Dome Institute (or MDI) is the information-generating and educational branch of the Monolithic family. Our MDI staff coordinates and maintains the material on our websites; publishes books and brochures; produces podcasts, CDs and texts; works with the media; hosts or participates in special events.

Those events include trade shows, community programs and four, hands-on, five-day Workshops each year that teach Monolithic technology.

In 1977 we built this 50' x 18' home overlooking Idaho's Snake River for my mom, Marj South. She loved its surround windows and vaulted ceilings.

Our staff of professionals includes designers, planners, engineers, mechanics, special equipment operators, a dome

construction crew and office personnel.

Now about this book! Right from the start, the very idea of doing it—putting together what we here at Monolithic simply began calling *our book*—generated a great deal of motivating excitement.

It soon became apparent that each of us had his or her reasons for why this book was important and should be written. Many thought we needed the book as a kind of vehicle for organizing and displaying our newest and best Monolithic Dome designs.

Others felt that it was the best way to document the advantages of our domes, such as their structural strength, low energy use, low maintenance.

But what finally came out of one brain storming session was the simple idea: **Now is the right time for this book!**

In a nutshell, that's true. This is the right time for this book because it is now that we have such a variety of small and large, simple and spectacular Monolithic Dome designs.

It is now that we have new or improved construction techniques, equipment and materials.

It is now that we have established websites and links as support networks for our dome builders and owners.

There's yet another *now reason:* the American idea of house is gradually but

The nonprofit "Domes for the World" built 80 domes in New Ngelepen, Indonesia after the 2006 earthquake.

significantly evolving. We're beginning to re-dream our dream-homes.

Many dream home planners still want and need very spacious houses. But many others are dreaming of homes with multi-purpose rather than single-purpose rooms; they want a fabulous design in an economy of space.

A growing number of Americans want sturdiness and longevity in their dream home. They don't want to invest themselves and their earnings into a structure that needs constant, extensive maintenance or that may not outlive its owners.

Still others want a dream home that complements rather than clashes with their

selected home site.

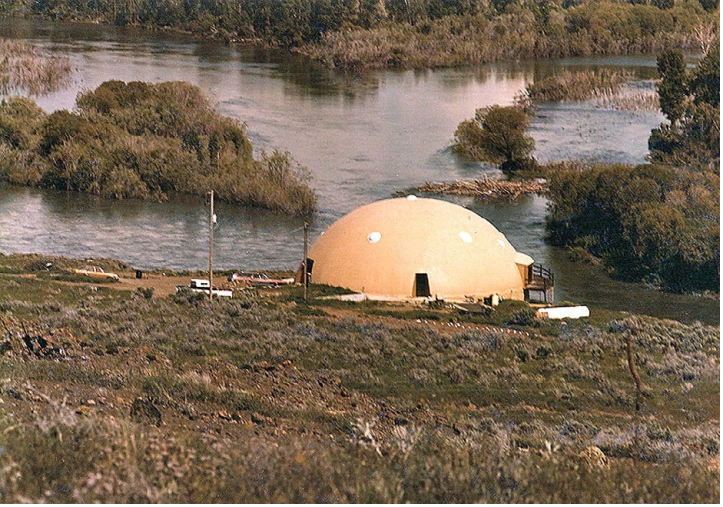
They may also not wish to further deplete this planet's natural wood resources or add to its environmental pollution.

All those *nows* served as our inspiration and motivation for this book—which as it turned out—is a practical, user-friendly, step-by-step guide for any dream-home planner.

In addition to the practical advice, in each chapter of this book, we've included photos and bits of information about completed Monolithic Dome homes of various sizes and styles.

So, here it is—***Dome Living: What You Need To Know About A Monolithic Dome Home—Before You Buy One!***

We hope it will be a source of information and an enjoyable tool you will use to plan and design exactly what you need and want your dream home to be. And of course we do hope it will be a Monolithic Dome dream home!



Built in 1978 in Menan, ID, “Cliffdome” was the first dome-home for the David South family. It was 75' x 28' with an 8000 sq ft living area and a 1500 sq ft attic. “Cliffdome” did not require air conditioning. It was cooled by pulling air through open windows at night, and heated with just a small, mobile-home heater.

On a Colorado Rockies ledge, this home is two domes merged into a unique, kidney shape. Three levels with 3800 sq ft of living space include a greenhouse, waterfall and indoor pool.

chapter two

A Monolithic Dome Home

What it is: An engineer, architect or construction manager might define a Monolithic Dome as "a thin-shell concrete structure." And it is! But to the average, ordinary person planning and designing that all-important dream home that definition may mean little.

For the home planner, a Monolithic Dome, we think, is best defined by its construction materials, its construction process and its versatility.

Construction Materials

Principal ingredients or materials used in the construction of a Monolithic Dome are an Airform, polyurethane foam, rebar and concrete.

Monolithic Dome Airform

A Monolithic Dome Airform is an inflatable structure made of PVC coated nylon or polyester fabrics. It looks and acts much like a giant, very strong balloon.

When inflated, the Airform forms the shape and size of the completed Monolithic Dome home. After construction, it stays on the outside of the dome-home as its roof membrane.

Airforms are available in several styles, colors, finishes and weights. Monolithic constructs them from fabrics specifically made for exterior applications and designs them as individual units for a specific project.

Using special patterns, equipment and technology, our Airforms are manufactured at our headquarters in Italy, Texas, inside a caterpillar-shaped Monolithic Dome we call *Bruco,* (*bruco* is Italian for caterpillar).

The Airform fabric must meet certain requirements for strength, elongation,

This Airform is being inflated. That inflation creates a sturdy structure, so that Monolithic's construction process can continue inside the Airform.

fabrication, ruggedness, durability and desired surface characteristics. Meeting these requirements is important because of the way in which the Airform is used.

In the construction process, the Airform or skin is attached to the dome's foundation ring, inflated, and then fleshed out when polyurethane foam and steel reinforced concrete are applied to its interior. Obviously, the Airform must be durable. It must be able to withstand handling, spreading, fastening to the foundation, being inflated by powerful fans and remaining inflated during the spraying process.

Durability remains important even after a Monolithic Dome's construction is completed because the Airform can remain uncoated for years. So the Airform—as the dome's permanent, exterior surface—must be resistant to degradation from ultraviolet rays and weather exposure.

But even a rock will degrade in sunshine! Therefore, at some point in time the Airform must be protected. It may be coated—either at the time the dome is completed or several years later.

Liquid coatings or stucco can be easily applied with brushes, sprayers or rollers. We also have developed several methods of covering a dome with stucco, concrete, ceramic tile, rock or metal cladding.

Each Airform is designed, configured and manufactured to meet the size, shape and design specifications of the Monolithic Dome home you want it to become.

We have hundreds of house plans and a virtually endless variety of sizes, shapes

By designing and manufacturing unique, complex Airforms, we turn dream homes into real homes.

and configurations for Monolithic Dome homes.

Choosing or creating the design of your dome-home depends on your needs, wants and dream. Your home can be a single-story or a multistory. It can consist of a single dome or two or more connected domes.

Such variety makes it easier and more fun for individuals to plan the Monolithic Dome home of their dreams.

Monolithic Domes designed as arenas, stadiums, bulk storages, gyms, schools, churches, or other uses can be built as large as 1000 feet in diameter. So in reality, a dome home can be as large as you desire.

Polyurethane foam

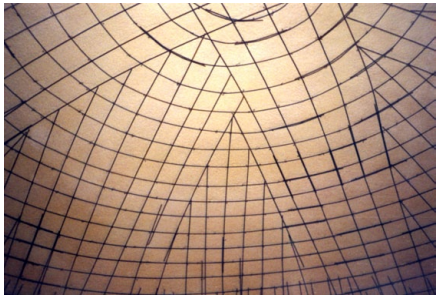
Polyurethane foam is the second principal material used in the construction of a Monolithic Dome. Once the Airform is inflated, its interior is sprayed with an average of three inches of polyurethane foam that becomes the home's super, energy-saving insulation.

We developed the use of spray-in-place polyurethane foam because of its insulating quality. It has at least twice the insulating capacity of the next best insulation.

When sprayed in place, the foam expands thirty times its original size and then sets in about three seconds.

It fills every nook and cranny and completely seals a structure. Moreover, it's virtually waterproof, forms its own vapor barrier and is structurally strong.

Inflated Airform's interior is sprayed with polyurethane foam insulation.



Using a predetermined, engineered pattern, rebar is inserted into the foam.

Layers of shotcrete are sprayed over the foam, completely embedding the rebar.

Rebar

Rebar is the shortened name for **reinforcing steel bar.** Simply put, rebar is a steel bar with ridges that is used to strengthen concrete.

In Monolithic's construction process, rebar hangers are placed into the polyurethane foam. Rebar is then attached to the hangers in a pattern predetermined by the size and shape of a particular dome.

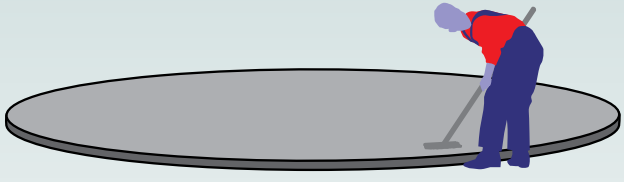
The size of the dome also determines the size of its rebar. Small domes need small diameter bars with wide spacing, while bigger domes require larger bars with closer spacing. Connections between two domes call for additional rebar.

Concrete

Concrete used in the building of a Monolithic Dome is called shotcrete. It's a special mix of concrete that is spray-applied to an average thickness of three inches, covering the foam and embedding the rebar on the inside of the dome.

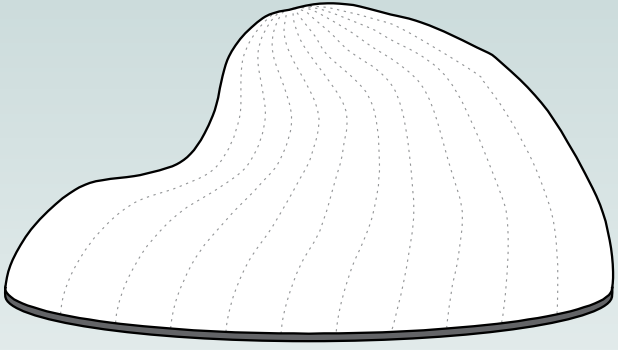
The shotcrete formulation we use and teach creates concrete that's much stronger than ordinary concrete. This is possible by the use of extra cement, less water, special additives, and the impaction of the shotcrete as it is sprayed in place.

The Construction Process



Footing

A Monolithic Dome starts as a concrete ring foundation, reinforced with steel rebar. Vertical steel bars embedded in the ring beam footing are later attached to the steel reinforcing of the dome itself. Small domes may use an integrated floor and ring foundation. Otherwise, the floor is poured after completion of the dome.

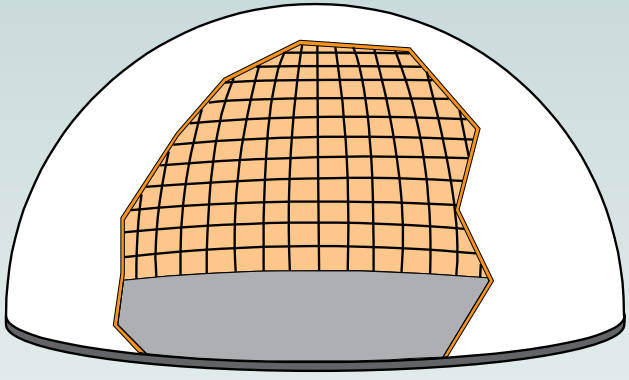


Airform

Fabricated to a proper shape and size, the Airform is attached to the ring base. Using inflator fans, it's inflated. Inflation creates the shape of the dome. The inflator fans run nonstop during the entire construction of the dome shell.

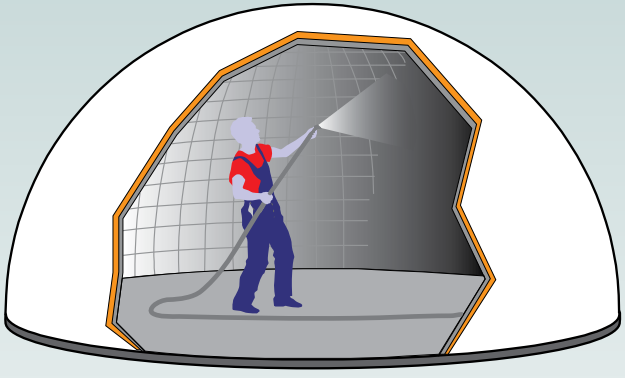
Polyurethane Foam

Approximately three inches of polyurethane foam are sprayed on the interior surface of the inflated Airform. Since inside air-pressure must be kept at a constant level, entrance into the Airform is made only through a double-door airlock.



Rebar

Steel reinforcing rebar is attached to the foam, using a specially engineered layout of hoop (horizontal) and vertical steel rebar.



Shotcrete

Shotcrete is sprayed on the interior of the dome, embedding the rebar. When an average of three inches of shotcrete is applied, the Monolithic Dome is finished. Once the concrete sets, inflator fans are turned off.

"Vista Dhome" nestles in the foothills of California's San Bernardino Mountains, on a ridge with a commanding view of Riverside County. It's an aerodynamic design of three domes flowing into each other.

chapter three

Thinking You're Safe and Really Being Safe

This is a thin-shell concrete dome not built by Monolithic or up to Monolithic standards. But the dome shape enabled it to survive a direct hit by a Force 5 tornado.

There's a difference. Under normal circumstances, most of us just don't do a lot of thinking or worrying about the strength of the houses we live in. We take it for granted.

Our houses look strong, so we assume they are strong. But are they?

We think about and sometimes worry about the strength of skyscrapers, bridges and tunnels. But not houses.

If it's not a falling-down, dilapidated wreck, we think it's okay—until something like a tornado hits! Yes, when it comes to houses, looks can be and are deceiving.

Real strength is exactly that: what the house can withstand or endure without collapsing, burning, splitting or rotting.

A home with real strength protects its occupants from injury and death. It keeps them ***really safe.***

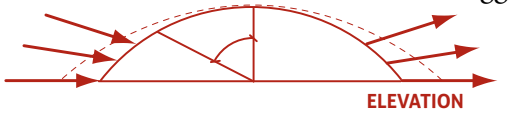
Monolithic Domes have that kind of real strength. They can

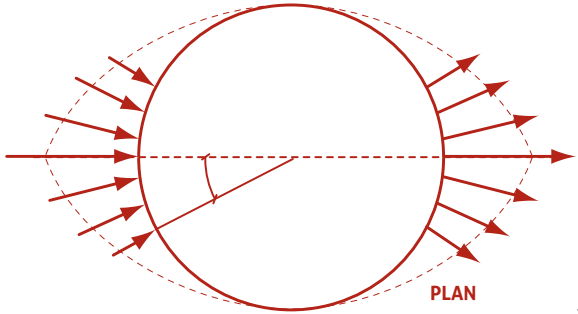
withstand the force of a tornado, hurricane or earthquake. They cannot burn, rot or be eaten by bugs.

Monolithic Domes get that strength in two ways: from their shape and from the materials used in their construction.

Shaped For Real Strength

There's nothing assumed or imaginary about the strength a dome gets from its shape.





A Monolithic Dome starts out as a shell structure shaped like an egg. But don't let that fool you. An egg may look fragile, but it's remarkably strong.

Here's a fun experiment: Clasp your hands in front of you and interlock your fingers. Pull your palms apart so your hands form a cup. Place an egg lengthwise in this cup. Now try to break the egg by pushing your palms together. You will not be able to do it. An egg is shaped with a double curve that distributes pressure evenly throughout the shell. As your palms push against the egg, most of the pressure transfers evenly throughout the whole shell to the other side of the egg and into your other palm.

April 2011 — The seven Monolithic Domes at Faith Chapel Christian Center in Birmingham, AL suffered only minor damage from a Force 5 tornado. But at this $51 million facility, that tornado leveled non-domes, causing damages of $500,000 (less than 1% of the facility's total value). Faith Chapel's main dome has a 280' diameter and seating for 3000.

Stress does not concentrate on one spot; therefore, the shell does not break. That's nature's engineering at its best!

The Monolithic Dome mimics that engineering. So houses designed with double curves are many times stronger than box-like houses with straight, flat lines.

Gravity is a structure's worst enemy, and it works harder against the horizontal than the vertical.

You can prove this principle with a 15-foot pole. Place the pole vertically in the center of your palm, and, with small, continuous motions, you can easily keep it balanced. But if you place the pole horizontally, you will not be able to do it.

That's because gravity works on the whole length of the pole. So, when it's placed vertically, the pole's weight focuses down into your hand. But when placed horizon-

tally, the pole forms a lever that works against you, making the balancing impossible.

Historical ruins show us that parts of a building placed horizontally suffer more from gravity than those placed vertically. Vertical columns and walls are found relatively intact far more often than roofs, horizontal beams or raised floors.

The passage of time proves that domes, with their double curves, are the best survivors. Rome's two-thousand-year-old Pantheon is a 143-foot diameter concrete dome that has been in continuous use since 126 A.D.

There are even older tomb domes in Greece, Istanbul, the Middle East and India that have survived in better condition than younger, rectangular structures with cornered walls and near-horizontal roofs.

Both Japan and Germany carry sad reminders of the durability of curvilinear buildings. The 1945 atomic bombing of Hiroshima left only one building standing near ground zero. It was the skeleton of a dome, built in 1915 as part of the Hiroshima Prefecture Industrial Hall, but is now preserved as the A-bomb Dome Memorial.

The Pantheon in Rome, Italy

In World War II Germany, thin-shell, dome-like structures survived Allied bombing better than most structures. Bombs either bounced off the dome or punched a hole. But even with a puncture, damage was localized just to that hole, since the thin-shell structure had no internal beams or columns to knock down.

Construction Materials for Real Strength

Here's a review of the major components used in building a Monolithic Dome, but this time with an emphasis on ***strength***.

Concrete

Believe it or not, all concrete is not equally strong. Concrete is a mixture of aggregate, cement and other components, so its strength depends on those ingredients.

The concrete mixture we use in Monolithic Domes is the result of extensive research and is the strongest we know how to make.

Its life span is measured in centuries—perhaps even millennia. It continues hardening as it cures for at least its first 25 years. We know this for a fact because we can measure the increase in the concrete's hardness.

Possibly, the concrete may continue hardening beyond its first quarter century, but we can no longer measure that increase with present testing equipment.

Aug. 11, 2002 — "Vista Dhome" was engulfed in but survived a fire that took 675 firefighters and 24 hours of intense fire fighting to finally extinguish. Fire Captain told the owners, "Well, you do know that if this structure had been made of normal construction that you would have a pile of ashes now."

Rebar

We know that concrete is very strong in compression; you can squeeze it very hard, and it won't break apart. On the other hand, concrete is weak in tension; if you pull hard on a concrete block, it falls apart.

Rebar, made of steel, has the opposite quality: it can endure tension, but buckles under compression.

But together the concrete and rebar do a great job keeping the Monolithic Dome strong: The concrete resists compression and keeps the rebar from buckling; the rebar binds the concrete when forces try to pull the dome apart.

Polyurethane Foam

Like the concrete, the polyurethane foam used to insulate a Monolithic Dome has no known lifetime—unless it's damaged by fire or ultraviolet radiation.

Such damage, however, is unlikely since we sandwich the polyurethane foam between the Airform and the concrete.

Ultraviolet radiation is sunshine. Sunshine applied directly to polyurethane will eventually degrade the foam since ultraviolet radiation *de-bonds* the foam's molecular structure. But polyurethane that is protected will last forever—or close to it!

Airform

Unlike the concrete and polyurethane foam, the Airform has a finite life. That's be-

cause the Airform is made of fabric and used as the outer covering of the Monolithic Dome. So it's exposed to the deteriorating forces of sunshine and the elements.

But that deterioration can be significantly slowed, even stopped, by coatings applied over the Airform.

A variety of coatings are available: elastomeric coatings, acrylic stucco, hand-split wood shakes, metal cladding, ceramic tile or even concrete.

Evidence of Durability and Proven Survivors

In this chapter, we've really talked a lot about the Monolithic Dome's durability and disaster-resistant strength.

But how do we know Monolithic Domes can survive tornadoes, hurricanes, earthquakes, fires, rot and bugs? We have data that proves it and survivors that testify to that ability.

Tornadoes and Hurricanes

Meteorologists rank tornadoes and hurricanes based on the violence and damage they cause. On the Enhanced Fujita Scale, the weakest tornado is EF0, with winds of 65 to 85 mph, causing moderate damage; the strongest is EF5, with winds of more than 200 mph, causing catastrophic damage.

On the Saffir-Simpson Scale, the weakest hurricane is F1 with winds of 74 to 95 mph and storm surge of 4 to 5 feet, causing moderate damage; the strongest is F5,

"Dome of a Home," a luxurious, beachfront, vacation-resort in Pensacola Beach, FL, has survived three hurricanes: Ivan in Sept. 2004, Dennis in July 2005, Katrina in Aug. 2005. For maximum hurricane protection, this dome's front stairs were designed to breakaway, providing an escape route through the garage for the storm surge. During Ivan the stairs did break away, but the living areas above remained undamaged. In fact, while Ivan raged, an MSNBC news crew, with official permission, sheltered in the dome and continued broadcasting until their equipment succumbed to the storm. Throughout that event, Kerry Sanders, a MSNBC correspondent with 21 years of hurricane-reporting experience, remained confident about the dome's engineering and design.

with winds greater than 155 mph, storm surge higher than 18 feet, causing catastrophic damage.

A wind speed of 300 mph exerts a force up to 400 pounds per square foot (psf). That pressure is twice as much as what a loaded semi-truck and trailer exert sitting on the ground! No rectilinear, conventional house can withstand a 400-psf force.

Monolithic Dome at Dupont plant in Delisle, MS. The company's Hurricane Crew of professional damage assessors sheltered in this dome during Hurricane Katrina. The storm did more than $100 million of damage to the plant, but the dome was unscathed. Afterwards, the crew named this dome "The Category 5 Shelter."

When violent winds, such as those in a tornado or hurricane, hit a home, several things can happen. The wind, exerting a pressure up to 400 psf, tends to push buildings sideways and topple them.

Then too, violent weather creates a depressurization, that can and often does blow the roof off a house.

But Monolithic Domes are curved. They don't have flat surface walls or roofs that winds can push against. So Monolithic Domes can withstand a 400-psf pressure and severe pressure changes.

We know this because we often build Monolithic Domes for use underground. We have domes buried to a depth of 30 feet. This creates pressure of up to 2,000 psf—without crushing the Monolithic Dome.

Since water has more mass than wind, it pushes with more force. Consequently, homes designed for a beach front location must have a built-in capacity to survive storm surge.

Large openings, designed and built into the lower part of the Monolithic Dome beach home, provide that ability. These openings allow the storm surge to pass under the dome without harming its upper floors with the home's living areas.

Tornadoes and hurricanes may cause minor damage to a Monolithic Dome. Violent winds and storm surge can ram a dome with flying debris—anything from a tree limb to a car—and could puncture the dome's outer covering.

But that puncture is localized and usually simple to repair. Such weather can also shatter windows and destroy shutters and screens, but those are relatively inexpensive items and easily replaced.

The point is that neither tornadoes nor hurricanes can destroy or cause serious structural damage to a Monolithic Dome.

The Tainan Office Dome, 46' x 16' in Taichung Taiwan, survived a 7.7 earthquake in 1999 that moved a mountain, killed 2415 people and did $10 billion of damage. Two conventional buildings next to this Monolithic Dome were leveled.

Earthquakes

They happen all over the world many times a year, but most are too small to be felt. Earthquakes range in magnitude from a weak 2.5 to a Magnitude 8—a major shaker capable of tremendous damage.

According to the National Earthquake Center operated by the U.S. Geological Survey, "Earthquakes push on a building in all directions—up and down, but most of all, sideways. A safe building is one that can withstand the sideways move."

Because of its curved shape and the materials used in its construction, the Monolithic Dome is such a building. The same data that proves the Monolithic Dome's tornado and hurricane survivability also establishes its earthquake survivability.

Remember: a Monolithic Dome buried under 30 feet of dirt can successfully endure 2,000 psf. So earthquakes don't mean much to a Monolithic Dome.

The most likely place of a building's failure in an earthquake is at its moment connections—for example, where a roof meets a wall. Monolithic Domes have almost no connections; therefore, no failure.

Fire

Concrete is a noncombustible material. Since the main structure of a Monolithic Dome is made of concrete, it cannot burn.

Fire inside a dome could burn the sheetrock, furniture and other combustibles, and possibly blow out windows, but it would not penetrate or destroy the concrete shell.

"Antelope Springs Ranch" in Blackwell, TX. On Father's Day 2011, a wildfire burned 100,000 acres. The surrounding buildings were destroyed, but the Monolithic Dome survived with just a scar.

Fire sparks hitting the outside of a Monolithic Dome could scorch the Airform. The Airform and foam will not support combustion.

In other words, when the Airform or the foam is exposed to flame, it will burn, but when the flame is removed, the Airform and the foam will not continue to burn.

Monolithic Dome homes with Airforms covered with concrete or stucco would not be harmed at all.

Rot

It slowly deteriorates a house in spots where moisture gets trapped between layers of wood or next to wood. Those spots can include door and window frames as well as connection points, such as those between foundation and walls, between walls, and between walls and the roof.

Monolithic Domes have few connection points, and their construction requires relatively small amounts of wood. So, they are not as susceptible to rot as conventionally designed homes, built with significantly greater amounts of wood.

Monolithic Domes with wooden window and door frames which are sealed and moisture-proofed have virtually no susceptibility to rot.

Termites

The National Pest Management Association Inc. claims, "Termites cause $5 billion in damage every year." While termites will feed on leaf litter, roots, dead herbs and grass, dung and humus, their all-time favorite food is wood.

Concrete definitely is not on any termite menu—nor are any of the other major components of a Monolithic Dome.

Please note: A Monolithic Dome is the only structure that can be purchased at a reasonable price and that can withstand most natural and manmade disasters!

Because Monolithic Domes are hurricane-safe, in 2002, the owners of "Dome of a Home" were awarded a FEMA grant for 75% of the eligible cost, including the dome shell.

chapter four

Monolithic Dome Dream Homes with True Beauty

We perceive beauty through our senses, but it penetrates our hearts and spirits as well. In other words, it is beauty when it satisfies some need and really makes us feel good.

A dream home should do that. It should satisfy our needs and make us happy. That kind of satisfaction comes from planning that subtracts as well as adds.

What I mean is simply this. A dream home is an accumulation of ideas generated by our experiences in a house or houses we've already lived in or visited. So when we plan, we don't just think about what we want in our new home, but we think about what we want to eliminate.

For instance, we might plan a dream home with a special room the children can use to entertain their friends; that's an addition. Conversely, we might plan a room arrangement that would include a laundry area near bedrooms and eliminate long, tiring treks with heavy clothes baskets; that's a subtraction.

A curved, concrete stairway leads from the lowest level to the main living area of this dream home. The dome is three stories and encompasses three large bedrooms, a living room, a dining room, and a kitchen. It also has a two-car garage and a deck overlooking Lake Michigan.

Set in the hills of North Carolina's Blue Ridge Parkway, "Cloud Hidden" is an 85' long, 46' wide and 37' tall dream-come -true.

A dream home often is also a lifelong pursuit to live in a comfortable environment that satisfies and pleases us. And when it does, it's beautiful!

The individual characteristics of a home, those features you plan that fill your needs and desires, make it so, and it becomes your dream come true.

The universal dream home, the one that everybody thinks is beautiful simply does not exist. Nor do I think that it ever will. One person may find a particular structure appealing while another may totally disagree.

It happens all the time—just ask real estate agents. Each will recount some story of a wife who fell in love with a Victorian *mini-mansion* while the husband saw nothing but yards of gingerbread trim needing paint.

People will often point to a particular home design and say, "That's beautiful" or "That's gorgeous." But if you ask them why they think it's beautiful, usually they will talk about a specific feature and the feeling behind it: "I love the spacious living room, and the big fireplace makes me feel cozy and warm."

At Monolithic, we often hear reasons like these and the feelings behind them. But when it comes to Monolithic Dome dream homes, the beauty-reasons may be more unusual.

Nature lovers might select a dome design because it blends well with the environment and its construction doesn't deplete natural resources.

Senior citizens might love the minimal upkeep of a dome.

Others may think their Monolithic Dome is beautiful because of its structural strength and low energy use.

Forty years of designing and building Monolithic Dome homes convinced me that there are as many reasons for thinking a home is beautiful as there are people planning those dream homes—and they are all valid.

Owners of this Centennial, CO dome love their indoor pool with its autopilot salt water purifying system and heater.

What it boils down to is what you, the planner of your dream home, find beautiful. It could be something as obvious as the spherical symmetry, balance and grace of a Monolithic Dome, the spaciousness of its interior, or the abundance of natural light slanting through skylights and windows.

On the other hand, it could be something more subtle, such as the knowledge that your Monolithic Dome dream home can withstand tornadoes, or the serene feeling you experience every time you enter it.

The Monolithic Dome does not have mass appeal—at least, not yet. Monolithic Domes don't appeal to everyone because they are different, and many people are still too stuck in the mud of tradition and convention to even consider a Monolithic Dome.

Look closely at this Monolithic Dome home in Moscow, Russia. It's topped by an American flag!

For them, a structure will never be a dream home unless it fits into the neighborhood of their dreams, or is touted in popular literature, or is just like their friends have.

Monolithic Domes appeal to a select group of discriminating home owners—people who want an outwardly beautiful structure and much more. They're the beholders for whom beauty is far more than that which meets the eye.

They're also the folks responsible for a gradual but growing re-thinking of what a dream home should be. Such new thinking is not based on a fly-by-night trend but on an important value adjustment.

For example, the idea that a dream home must be huge no longer carries as much of the popular vote. Many dream home planners today don't buy into the notion of

The owners of the "Shamrock Chateau" have a large family and frequent guests. They designed a spacious great room with both a formal and a casual dining area.

At this stunning estate, the main dome-home is built on a pad atop a hill and connected by an elevated walkway to a garage/guest house that sits about a foot below the main dome.

the bigger, the better. Nor do they believe that to be a dream home it must be impressively large.

Instead, more folks now believe that unless a space or room is used on a daily basis it is not worth the expense or upkeep.

Monolithic Dome designs have the kind of flexibility that allows home planners to design their living space to suit their lifestyle. It could be big or small, but it always fits their desires.

Not only do we want our homes of a practical size, growing numbers of us want them stronger and safer. Our need for shelter that makes us feel protected and secure goes back to the beginning of history.

But thanks to modern communication methods, we know that the conventional roof over our head does not withstand tornadoes, hurricanes, hail storms, earthquakes and fires. We frequently hear about areas devastated by the forces of nature.

Consequently, more people than ever are searching for home designs such as

Monolithic Domes that incorporate beauty and the structural ability to survive severe weather, earthquakes and fires.

Rethinking what we really need and want from a home has also prompted many of us to reconsider efficiency. Fifty years ago, having an efficient home meant the homemaker could bake a cake with a minimum of movement and no unnecessary steps in the kitchen.

For many present-day home builders, *efficient* has a far

This dome-home in Ann Arbor, MI has a "monk staircase." The width of each step alternates from left to right. This creates a climbable staircase in the floor space of a ladder.

broader meaning. We're beginning to think in terms of efficient energy use, minimal maintenance, conservative use of natural resources and building materials, and efficient construction schedules.

The Monolithic Dome generously satisfies such current needs for efficiency.

Monolithic Domes are beautiful—in every sense of that word. They have an outer beauty—that which immediately strikes the eye of the beholder. But there's an inner beauty as well: the Monolithic Dome's innate strength, efficiency and flexibility.

The initial construction cost of a Monolithic Dome may compare to that of a traditional design, but in the long run the dome will prove much more cost effective.

Monolithic Domes are a smart buy!

- They are virtually disaster-proof.
- They offer design flexibility.
- They are constructed efficiently.
- They are energy-efficient, low maintenance and long-lasting.

Ultimately, it's these qualities that make the Monolithic Dome a beautiful, satisfying and secure dream home.

This spacious family area is the heart of a dome with 4200 sq ft, two floors, 12 rooms, a center court, and an atrium with a waterfall and a decorative concrete tree.

chapter five

Energy Efficiency in a Monolithic Dome

How do you picture yourself in your dream home? Curled in front of the fireplace? Relaxing in a hot tub? Enjoying nature from your balcony?

Wherever your imaginings place you and whatever you see yourself doing within your dream home, I'll bet you're comfortable. And you should be.

The home of your dreams should be a place of optimum comfort. But just what does that comfort encompass?

It's more than just maintaining a pleasant temperature. After all, many houses can be heated or cooled to a satisfactory degree, but at what expense?

If that heating or cooling costs homeowners more than they can afford, is that really comfort? I think not.

To be truly comfortable, a home—particularly a dream home—must have an energy-efficiency level that is not only comforting to your body, but to your pocketbook. It must contribute to your peace of mind.

Curved archways suggest a warm embrace and enhance the coziness of a Monolithic Dome home.

Unfortunately, some home planners don't put much thought into the energy efficiency of the home they're planning. As with the structural strength of a house, some take its energy efficiency for granted—until they get uncomfortable.

When people find that they can't keep a house warm or cool enough, when they discover worrisome drafts, or when their energy bills begin skyrocketing, they begin analyzing the structure's energy efficiency—or lack thereof.

The energy efficiency of a home should be thoroughly planned before the ground site is even leveled. Unless it is, the home of your dreams can quickly turn into a nightmare.

Energy Efficiency

To be energy efficient, a home, or any building, must have a heating and cooling system that's the right size and in proper working condition, and the structure must be efficiently insulated.

Insulation

Air moves continually through a house, and, since we need air to breathe, that's a very good thing.

Heat also moves. It moves from warm to cold areas. On cold days, the warm air inside a house struggles to get out. And on warm days, the outside heat fights just as fiercely to get in.

So what's a home planner to do? ***Insulate!*** Proper insulation significantly curbs the natural progression of heat from warm to cold.

Thus, in cold environments insulation minimizes inside heat loss, and in warm environments insulation slows inside heat gain. Effective insulation means comfort.

It means physically comfortable inside temperatures. It means feeling snug and secure—regardless of what may be going on outdoors. It means not feeling chilling drafts or hearing the wind whistling through rafters. It means reasonable energy costs.

On the other hand, poor insulation translates into discomfort, of mind and body.

According to the U.S. Department of Energy, maintaining an adequate comfort level in a poorly insulated home necessitates setting your thermostat at least three degrees higher for heat and at least three degrees lower for coolness. Usually, such adjustments are costly.

Homes can be insulated with a variety of products: fiberglass, cork, cellulose, alu-

At "Hobbit House of Montana" handcrafted items intensify visitors' sense of beauty and comfort.

minum, polystyrene, polyurethane. Then too, insulation products come in different forms: blankets, blocks, granules, spray-in-place foam. The one thing they all have in common is an R-value.

The R-value of an insulating material has nothing to do with its thickness. R-value refers to the material's resistance to heat flow. Theoretically, the higher the R-value, the better its ability to stop heat transfer, so the greater its insulating power.

People planning the construction of a home often think that all they need do to get effective insulation is contract for an insulating product with a high R-value.

While that's a good beginning, unfortunately, it's not quite that easy. Despite the quality of an insulating material, the energy efficiency of a home can be compromised if the structure is not properly sealed for heat loss and moisture control.

Air that is continuously moving through a house carries moisture, created by normal daily activities, such as bathing, laundry and cooking. If that moisture creeps into cracks and crevices and establishes a permanent hiding place, decay results.

In 1991, we built an *Oberon* (32-foot diameter, two bedroom home) in Italy, Texas as a model home. We invited TU, our local electrical power company, to do an air leakage test on the home.

After struggling for several hours, the technician said in disgust, "This is stupid; this equipment is not calibrated to properly test this tight of a building. The normal house has air leaks that total an area approximately equal to the size of a front door. This building has a total leakage equal to the size of the diameters of two pencils."

Monolithic Dome Insulation

With a Monolithic Dome dream home, insulation worries are eliminated. Two major building components of a Monolithic Dome are polyurethane foam and concrete.

That massive concrete shell acts as a heat sink, receiving and releasing the ambient or encompassing temperature.

Here's how it works: When heat builds up on the inside of a dome, it wants to pass through the concrete. And if it were not for the barrier on the other side of the concrete shell, the heat would do just that because concrete does not have a high R-value.

But **sprayed-in-place polyurethane foam** is that barrier. Polyurethane foam, a plastic material that helps maintain comfortable temperatures, has the highest insulating value of any building insulation.

Three inches of polyurethane foam that snugly blanket the concrete stop ninety-five percent of heat transfer.

This insulating ability of the Monolithic Dome's combination of polyurethane foam and concrete has been tested and measured by engineers, under controlled conditions, over substantial time periods.

Result: An effective R-value better than 60! This can be verified with a UCLA computer program called HEED (Home Energy Efficient Design) that shows thermal mass heat loss characteristics.

Because the polyurethane is sprayed so that it creates a continuous shell, air leaks, cracks and crevices where moisture can gather are virtually eliminated. This makes a Monolithic Dome dream home seamless and almost airtight.

Heating and Cooling Systems

In addition to effective insulation, an energy-efficient home must have a properly functioning heating and cooling system suited to the structure.

Unfortunately, contractors sometimes install heating and cooling systems that are oversized and inefficient and that increases energy costs.

Too many use the *sizing-by-square-footage* method. That is, they simply ask you the square footage of your living space, and based on that determine what size of heating and cooling units your house needs. This method disregards differences in home designs, construction materials, insulation and environment.

The "Gnome Dome" in Menan, ID is 25 years old. It's kept comfortably warm, day and night, by an under-the-floor, electrically heated water system. But the two water tanks are only heated at night when electricity is cheaper.

Monolithic Dome Heating and Cooling

Because a Monolithic Dome is so well insulated, it's easy to overestimate the size of heating and cooling units it needs.

For example, most people planning a two-bedroom home in a climate with hot, humid summers and near-freezing winters would not consider cooling that house with one air conditioning unit designed for a recreational vehicle or heating that home with two 1,250 watt heaters.

But that's exactly how a two-bedroom Monolithic Dome home, occupied by a family of three, in Texas, stays cucumber cool in the summer and toasty warm in the winter.

With a Monolithic Dome, your dream home can be heated and cooled with just about any system you fancy. And the Monolithic Dome Institute is here to advise you and help you make every choice—from type of system to size of units.

Energy Efficiency and Design Choices

Monolithic Dome dream homes come in a near limitless design variety. The choices are many. Consequently, it's important for you to know that the energy efficiency of a Monolithic Dome is never compromised by the design you choose.

Consider high ceilings, for example. People love the elegance and spaciousness of a home with high ceilings. Many of yesteryear's homes had such opulence. But then, convinced that high ceilings make rooms cold, many homeowners began remodeling and lowering those ceilings.

In reality, what made those houses cold were not their high ceilings, but their poor or nonexistent insulation. But the superior insulation of any Monolithic Dome design makes high ceilings a non-problem.

If you want high ceilings in your dream home, dream on. With a Monolithic Dome, you can have them plus *uncompromised* energy efficiency.

Real Energy Conservation and Low Energy Costs

Just about every day we get email, snail mail and phone calls from people who live or work in Monolithic Domes telling us about the low energy consumption and low energy costs they're experiencing:

- Ray Parsons and Nancy Jensen built a home of three, interconnected Monolithic Domes south of Tuscon and near Amado, Arizona, where winter temperatures drop to freezing. Unheated, their domes can maintain an average interior temperature of 66°F for several days.
- Chuck and Louise Snyder have 3,000 square feet of living area in their Monolithic Dome home overlooking the Kasilof River in Alaska. In January 1999, the Snyders accidentally ran out of heating oil. But despite a -30°F temp, they didn't discover the absence of fuel or feel a heat loss until they ran out of hot water, several days later.
- In the 1980s, Steve and Linda Price built their 34-foot diameter, 1,600 square foot, two-level Monolithic Dome home at 4,800-foot elevation in

southeastern Idaho—cold winters. In 1987, the Prices' energy supplier, Utah Power and Light Company, amazed by their low energy consumption, installed a separate meter in the Price home just to measure kilowatts used for heat. During that first year, their total cost for heat was $99! The following year, it was $115.

- Trinity Christian Center's Monolithic Dome church in Soldotna, Alaska encompasses 8,000 square feet. In 1999, Pastor Ray Ansel reported that their "... natural gas heating averaged $72 per month. Heating a traditional building of similar size would cost $1,000 or more per month. We're paying less than one-tenth of that!"
- In 1996, the month of June brought record-breaking heat and drought conditions to central Texas. But Antonio Carducci told us that his electric bill for that month for his 3,100-square-foot Monolithic Dome home was an unbelievably modest $24.96.
- Jeff and Susan Crandall's dream home is a 50-foot diameter Monolithic Dome with 1,964 square feet on its main floor and 650 square feet in its loft. Located in Menan, Idaho, their dome requires no air conditioning and only 10,000 watts of electricity for heating.

Healthy and Safe Breathing

A**n Important Question:** How do you bring fresh, breathable air inside your home without losing the dome's energy efficiency?

Carbon dioxide gas (CO2) has many sources. We produce CO2 when we breathe and plants give off CO2 when the sun isn't shining. (They give off oxygen when the sun is shining.) Combustion also produces CO2, as do coal-fired energy plants, cars, trucks, forest fires, etc.

High levels of CO2 in a home may indicate poor overall air quality. For instance, one can assume that if CO2 levels are high, so are other pollutant levels such as outgassing from carpets, furniture and pet dander.

Monitoring brings surprises

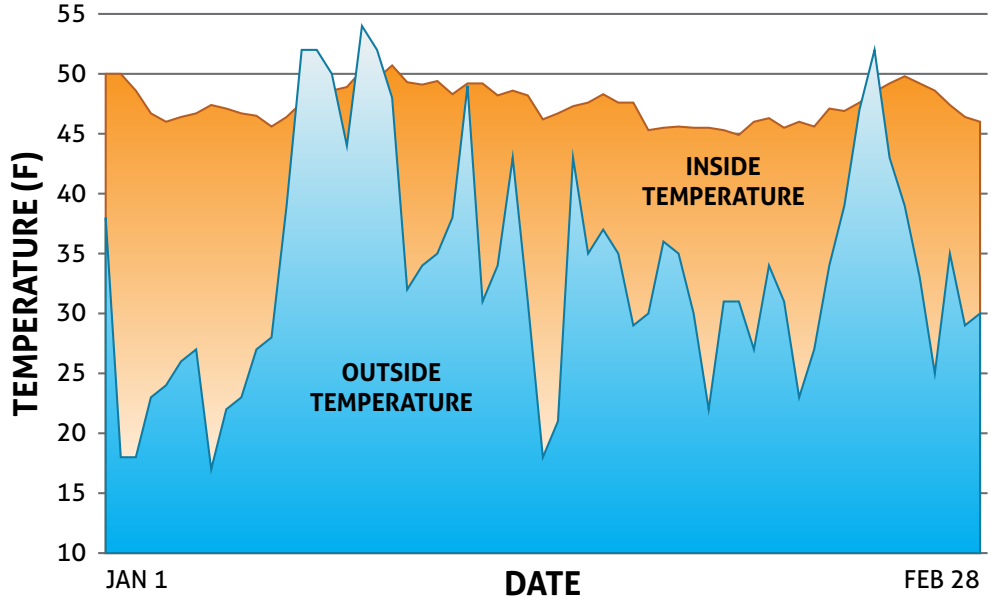
Since June 2002, Monolithic has been monitoring CO2 in many homes—both domes and conventional. They all have too much CO2 most of the time. If windows are opened, CO2 levels drop to 400 parts per million (ppm)—the same as outside. But modern houses are airtight, and Monolithic Domes are the tightest of them all. Consequently, CO2 levels can rise drastically over short periods.

For commercial buildings, 1200 ppm is considered the trigger point for fresh air intake. So we are assuming that 1200 ppm is the maximum we should have in our houses.

It was a surprise to us to discover (in both conventional and Monolithic Dome

homes) how often we found CO2 levels above 1200 ppm. We were shocked to find that, at times, the CO2 in some homes reached 4000 ppm. In fact, we found that most homes are always above the 1200 ppm number. (OSHA fines facilities with readings above 4000 ppm.) I have carried a portable monitor into many buildings and places. It is amazing how few buildings with people inside stay below 1200 ppm.

In Galax, VA during the winter of 2010, owners of a partially finished but unoccupied, unheated dome recorded the daily interior and exterior temperatures. Amazed by the stability of the dome's inside temperature, they sent us their findings.



The Answer: We believe we have found an answer to the CO2 issue. It comes in the form of an ERV (Energy Recovery Ventilator or HRV Heat Recovery Ventilator).

These machines bring outside "fresh" air into the home and exhaust an equal amount of the home's stale air. And, as if by magic, ERVs also recapture most of the heat from the respective air streams.

This is done in the box by an air-to-air heat exchanger. By recovering the heat, we spend less to heat or cool the exchanged air, thus saving huge amounts of energy while getting the fresh air we need.

In Canada, most new homes must install an ERV. Studies have led us to conclude that we should follow suit.

Keep in mind: There are many days when we could heat or cool a dome using just fresh air.

Example: This morning it was 57 degrees outside and my air conditioner was running. It was cooling the shell a bit from yesterday's temps in the upper 80s. If we had a good way to bring in lots of air at those times, we could use it to charge the dome's thermal battery. On the other hand, we do not want outside air during an ozone alert, or when it's very humid—even if the temperature is optimum.

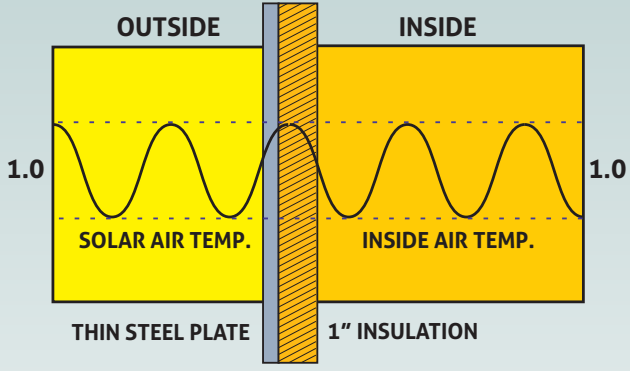
Passive Solar

A passive solar structure is one that absorbs and stores heat from the sun during the day for use at night. In other words, you can't beat a passive solar system for efficient energy use and minimal energy cost.

The Monolithic Dome is naturally a passive solar structure. Its building materials and construction method make it so.

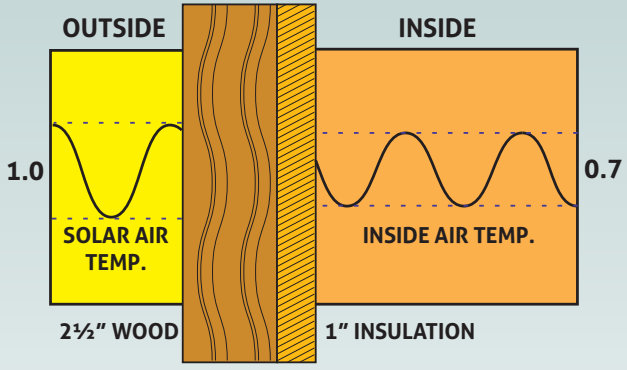
Monolithic Domes effectively absorb heat when it's available, store it for long periods, and release it during no-heat times.

These illustrations, taken from the ***Passive Solar Handbook***, California Energy Commission, January 28, 1980, show how insulation affects the transfer and storage of solar heat.



Baseline Comparison

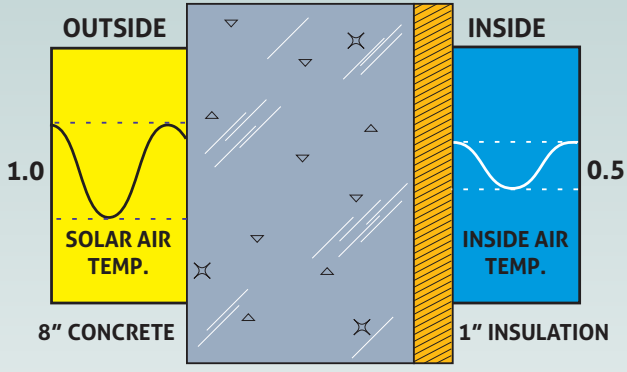
A thin steel plate is backed with one inch of insulation. The wavy line, called a sine wave, of equal size on both the outside and inside shows that the steel plate and its insulation has a negligible effect on heat transfer and storage. With a ratio of 1.0 to 1.0, obviously, these are not effective materials for a passive solar structure.



Typical House Exterior

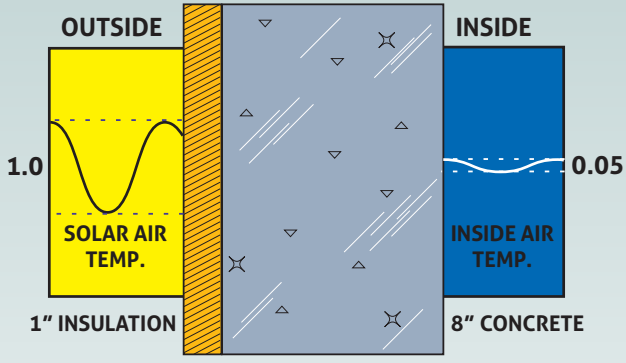
Wood, 2 1/2 inches thick, is backed with an inch of insulation. The 2 1/2 inches of wood adds to the insulation, so the inside temperature follows a slower cycle.

Therefore the inside does not get as hot or as cold as the outside. The slightly improved ratio here is 1.0 to 0.7.



Exterior Concrete

Eight inches of concrete are backed with one inch of insulation. The concrete acts as an insulation in that the heat from the exterior is absorbed into it. In fact, massive concrete can absorb more heat than what's presented to it, so if more sunlight were available the concrete would absorb more. Then, as the building cools, the heat is released. The ratio here is better: 1.0 to 0.5 or twice as good.



Interior Concrete

Here we see what happens when the insulation is moved from the inside to the outside of the concrete. This repositioning makes the concrete into a thermal mass, capable of storing enormous quantities of heat. Note the ratio: 1.0 to 0.05 or ***twenty times better!***

The Monolithic Dome's Insulation

A Monolithic Dome is insulated with three inches of the world's best insulation: polyurethane foam. It insulates the thermal mass and allows the thermal mass to even-out temperature changes not only over days, but over weeks and months.

So insulated, the thermal mass will actually store heat absorbed during the summer for release in the winter.

We know this because large Monolithic Domes, left unoccupied with no internal heating or cooling, will rarely vary more than 20°F degrees from summer to winter, or more than 2°F degrees during any one day.

Indeed, we can say the Monolithic Dome is a superior passive solar system.

"Eye of the Storm," Sullivan's Island, SC — It replaced a conventional home that was destroyed by 1989's Hurricane Hugo and has weathered several other hurricanes since 1991.

chapter six

What is the real or *True Cost* of a dream home?

Is that cost the total money amount that you spend on the home's construction? Or, more realistically, is it that—plus the ongoing upkeep and long-term maintenance costs?

Obviously, when it comes to the price of a dream home, there are at least two ways of thinking about it: initial construction cost and ongoing maintenance cost.

Construction Costs

Most of us spend a great deal of time—often years—dreaming about and planning our dream home. In that planning process, we endow our house with characteristics that are important to us and that we want the house to have.

For example, we want our dream home to be beautiful. We want it to be comfortable. We want it to keep us safe and secure. And we want it to have value—a value that makes us feel we spent our money wisely. After all, that dream home may be the

one in which we will spend the rest of our life.

But how do you determine real value? One way is by making comparisons. You can, for example, compare the estimated cost of constructing a Monolithic Dome home to the estimated cost of building a conventional design, similar-size house.

But, if you compare only total construction costs, you probably will discover that they total up about the same.

In other words, building a Monolithic Dome home with 3,000 square feet of living area, for instance, probably will cost about the same as building a conventional home with that square footage. Consequently, at that point the Monolithic Dome

Magnolia, TX — The owners of this home hand covered their 53' x 18' dome with manufactured stone, a spectacular, long-lasting exterior finish.

does not appear to be a bargain.

You may very well ask: where are the savings? Where is the value? But by contrasting such initial construction costs, we only make a partial and an unfair comparison.

For a more realistic picture, other factors need comparing. How does the strength and durability of the construction materials in a conventional structure compare to those in a Monolithic Dome?

What about the construction schedule? While there are no guarantees, are you less likely to run into costly delays with a traditional home or a Monolithic Dome?

What about design flexibility? How does making changes to a rectilinear design compare with changing features in a Monolithic Dome?

Italy, TX -- This Monolithic Dome dream home has a 12' arched entry that opens onto a central living area with high ceilings and 2660 sq ft.

Construction Materials

Most conventionally designed custom homes are wood frame, possibly reinforced with some steel, and covered with brick veneer, stucco or more wood. If they're standard U.S. homes they probably have a Type V fire rating. That means that they are built entirely of combustible materials.

Nor can most standard U.S. homes survive natural disasters or a termite or rot infestation. Without a continuous, closely followed maintenance program, most have limited durability and a short lifespan.

Major ingredients in a Monolithic Dome include the Airform, polyurethane foam, and steel-reinforced concrete.

Airforms are made of roofing membrane; these fabrics are continually tested to assure performance and durability. The concrete we advise using is of the highest quality, as is the polyurethane foam. Years of research went into their development.

Moreover, these materials give the Monolithic Dome a Type II or better fire rating. They make the Monolithic Dome *unburnable*, disaster-resistant, termite- and rot-proof and give it a lifespan measured in centuries.

Let's take another look at that 3,000 square-foot dream home. For about the same price, it can be built in a traditional design with conventional materials or as a Monolithic Dome. Obviously, the value-difference is not in the construction cost; it's in the type of materials used.

Santiago Canyon, CA — This 48' x 25' dome with 2295 sq ft includes a beautiful, wooden, spiral staircase, built using a kit.

But how is that possible? Our dome-building process, which is a relatively simple one, requiring less time, less subcontracting and less labor makes it possible. Money normally spent maintaining slow construction schedules and paying for more subcontractors and their workers, can be spent on better materials.

Of course, you probably can build a 3,000 square-foot dream home in a traditional design, using the same concrete and foam we use, but you won't do it at a Monolithic Dome price. That traditional design built with dome materials will cost you substantially more!

Construction Schedule

Delays in construction usually occur in one of two ways: shortage of building material or inclement weather. Such delays often affect conventional construction, and—just as often—they create emotional havoc and financial problems for folks anxiously awaiting the completion of their dream home.

During the building of a Monolithic Dome, such delays are rare. Airforms are manufactured and shipped following a predetermined and carefully adhered to schedule. Other materials, such as the concrete, foam and rebar, generally are easily available almost anywhere in the world.

Once the Airform is inflated, most construction activity happens inside, not outside, the dome, unaffected by weather or daylight. While this may be a minor concern when building in temperate climates, it's a major one in extreme climates.

Design Flexibility

If you ask folks who have gone through the process of changing or trying to change a room arrangement in a conventional design home plan, they probably will tell you it was not that easy.

They may even tell you that the change they wanted was surprisingly costly. The same may even hold true for a simpler change, such as the placement or size of a door. Rectilinear structures, by their very nature, are not very flexible.

On the other hand, Monolithic Dome designs, by their very nature, are flexible and relatively easy to change. The interior of the dome is an open vessel in which anything can be placed.

Open areas within curved lines easily convert into almost any size and shape of room you may want. That flexibility applies to changing room arrangements as well as specific features.

However, once the dome is solid, the Monolithic concrete shell is quite inflexible. If additional domes are anticipated, provisions should be made in the construction process of the original dome for further dome additions.

We can make more comparisons related to the construction process. What about material waste? Or depletion of natural resources? Ever drive by a construction site and notice the wood, sheet rock, bricks and hardware scattered haphazardly about the site?

What do you think happens to it? Chances are the contractor gets a reclamation service to pick it all up and get it out of there. As far as the contractor is concerned, such unused construction materials are trash. But it's trash the homeowner had to pay for! And why is there so much? Two factors usually contribute to the waste: poor planning and bulk purchasing. There's no excuse for poor planning.

Bulk purchasing is another story. Conventional building materials often come in predetermined quantities, forcing builders to over buy or risk running short.

But before the actual construction process begins for a Monolithic Dome, the amounts of each material needed for a particular design are carefully calculated and determined, greatly reducing waste and over buying.

Brigham City, UT — In this 32' x 18' small dome with 800 sq ft, the south facing windows provide a great view and most of the heat needed in the winter. During the summer, night air through open windows keeps the dome cool during the day.

As for depletion of this planet's natural resources, the use of concrete for construction simply does not do that. Unlike conventional construction, Monolithic Dome building requires small amounts of lumber; thus it conserves our natural wood resources.

The Long Term

Planning a dream home is fun—but it's not always easy. At this point, you may even find these comparisons tedious. I have to agree. But, guess what, we're not done yet.

While comparing construction costs and other factors is an important part of the dream-home-planning process, I think there's an even more vital comparison you, the dream-home builder, should make. That involves contrasting the ongoing, long-term costs, maintenance and wearability of a conventional home to that of a Monolithic Dome.

Ongoing Costs

Standard, ongoing bills—such as insurance premiums and utility payments—always accompany home ownership. These expenses continue during the entire time a house is occupied. So, how do Monolithic Domes compare?

Insurance

One of the questions an insurance company always asks is *What is your house made of?* Materials used in a structure's construction directly relate to its damage vulnerability.

For example, insurance companies know that a house made of wood is more susceptible to fire and termites than one built of bricks. So the brick home gets a better or lower rate than the wood house. But even brick homes are more likely to burn or

get termites than a fire safe, indigestible, concrete Monolithic Dome.

And it's that damage vulnerability that determines an insurance premium. Where the possibility of damage or loss is high, the cost of the insurance is high. Conversely, less chance of loss results in lower insurance premiums.

A Monolithic Dome is made of high grade, ***noncombustible concrete,*** insulated with ***fire-retardant polyurethane foam.*** These materials make it fire safe and virtually immune to insects and decay. They, together with the dome's shape, enable a Monolithic Dome to withstand high winds, ferocious storms, hurricanes, tornadoes and earthquakes.

Obviously, a Monolithic Dome's damage vulnerability is low. The contents inside the dome can burn, but the dome itself will not. So the possibility of fire damage is limited to contents, interior smoke or water damage, and blown-out windows. While that may mount up, it's certainly not as high as the loss of an entire structure—and insurance companies know that!

The same is true of damage caused by natural disasters. Tornadoes, hurricanes and earthquakes might destroy its windows, doors and shutters, but will not level a Monolithic Dome.

When determining the insurance premium for a home, insurance companies also consider the risks that are most likely to happen in a specific area.

For example, I live in a part of Texas where high winds, hail showers, heavy rain-

Manitowoc, WI — A wall of windows in the dining area of this spectacular dome overlooking Lake Michigan provides light and a gorgeous view.

storms and tornadoes are not at all unusual. Here, owners of conventional houses often experience roof damage and even roof loss.

But the worst possible wind cannot damage the roofing on our dome because the Monolithic Dome has a single ply roof membrane! There are no individual shingles

for the wind to get under and rip off. Hail will hit the curved surface and just slide down imposing no structural damage. Nor do rainstorms or tornadoes threaten the structure of our dome.

Such facts, presented to an insurance company, should lower insurance costs. That's exactly what happened to Shirley and Don Tuttle, a couple who, in 1998, moved into their Monolithic Dome dream home in Shamrock, Texas. The Tuttles have a 37-foot diameter center dome for their kitchen and living areas, flanked by two 24-foot diameter domes for bedrooms, bathrooms and an office.

When Don first checked into homeowner's insurance, the agent quoted an annual premium of $800. That high quotation sent Don insurance shopping. His efforts paid off. Don found an insurance agent who really listened, then decided that the Monolithic Dome was not correctly evaluated and contacted the Texas State Insurance Commissioners Office with a request for a reevaluation.

In Moscow, Russia this dome has a custom-designed staircase and a double-door that stops cold from entering the living area.

The state agency complied and the reevaluation resulted in an annual premium of just $174—a savings of $626 per year!

For many people, that amount of a savings is a joy just as a one-time occurrence. Let's consider what it means for the long run. In ten years, that's a saving of $6,260; in twenty years, it's $12,520 and so on.

Utilities

Using three inches of polyurethane foam together with three inches of concrete makes Monolithic Domes extremely energy efficient. They require only half or less energy to heat and cool than do same-size, conventional houses.

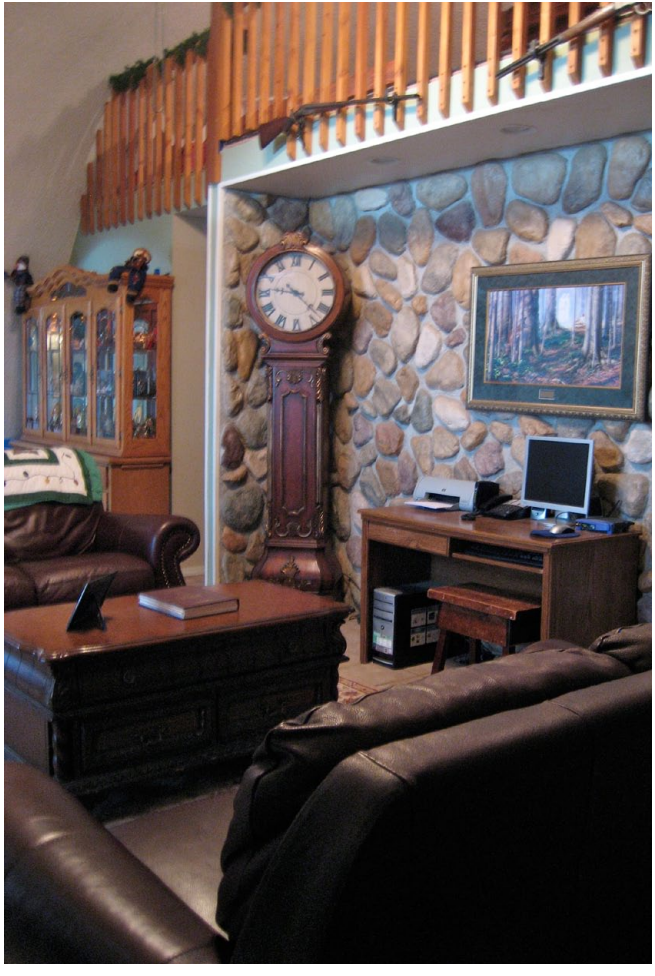
Here's one homeowner's experience: He moved from a 1,400 square-foot, conventional home to a 2,700 square-foot Monolithic Dome. Although he expected his energy bill to rise, it remained the same. In other words, his utility usage and its cost did not increase even though the size of his home almost doubled!

Again, we need to consider what energy efficiency and affordable utility costs mean to the homeowner in the long run.

Many couples are in their mid-forties by the time they finally build their dream home. At that point, one or both probably earn comfortable salaries. But that point is not a constant.

Life's circumstances change: Homeowners get older; they might retire; instead of comfortable salaries, they might have to adjust to living on a fixed income. And that's just a small sampling of what might occur and affect how we live and how we spend.

It's wise to think about these potential changes in our lifestyle—especially when planning on building and moving into a new home. What's affordable today may not be so affordable in the future.



Generally, prices, including utility costs, go up rather than down. When that happens, even if you live in a Monolithic Dome, you will be faced with having to pay more for energy. But, it will still be significantly less than what your neighbor in the same-size, conventional house will have to pay.

Ongoing Maintenance

Sad to say—we have not invented a maintenance free home, and, unfortunately, I'm sure no one ever will. Every house—even a Monolithic Dome—requires care! But, Monolithic Domes usually require less maintenance because there's less potential for problems.

The dome's curvilinear design, its straightforward building process, and its superior materials keep maintenance at a minimum.

In Menan, ID, this dome-home with 4000 sq ft includes a comfortable living area for both family members and guests.

Structures can develop many kinds of problems—some really serious ones, such as roof leaks and foundation cracks. Since our domes have no roofs, we have no roof problems.

But Monolithic Domes do have foundations. And here in Texas expensive foundation problems often plague homeowners. Our extreme temperatures cause the soil to contract and expand, so the ground beneath the foundation shifts. That shifting ground can split or crack a foundation.

While that kind of splitting and cracking happens often to conventional dwellings, it has never happened to a Monolithic Dome—nor do we expect it to ever happen. The steel ring foundation enables the dome to withstand the ground's shifting without the dome cracking.

Summer 2011: Texas had severe drought and 100 days of temperatures at or over 100°F. Our Monolithic Dome homes in Italy, Texas experienced a little ground shifting, but none suffered any damage.

There's really no secret or hardship involved in maintaining the exterior and interior beauty of a Monolithic Dome dream home.

Airforms not overlaid with stucco, concrete or some other material should be washed once or twice a year. If the Airform has been painted, it, like the outside of any house, will require periodic repainting.

The same holds true for the interior; like the inside of any home, over time a

dome's walls need cleaning or repainting.

People considering a Monolithic Dome sometimes worry about ceiling and wall cracks. Since all concrete cracks, that's a legitimate concern. But all cracks are not the same and all concrete does not crack in the same way. There are long cracks and short ones, wide ones and thin ones.

The amount of cracking and the severity of the cracks depend on the strength of the concrete and its environment. It's important to remember that the dome is insulated from extreme temperature changes. This insulation eliminates cracks that have any effect whatsoever on the dome's strength. These types of cracks are strictly cosmetic!

Remember that the concrete recommended for Monolithic Domes is a superior product,

"Atalaya del Vulcan" in Menan, ID — Breakfast nook Is set off the main living area by a circular divider made of concrete and wood.

reinforced with rebar. In addition to the steel reinforcement, a fiberglass filament is mixed into the concrete. Those reinforcements keep the dome from developing any serious cracking.

The hairline cracks that do occur often are almost invisible and easy to repair. Many get filled-in just with a dab of fresh paint. Others might need a filler that you can probably spread over the crack with your finger, allow to dry, then lightly sand and repaint.

Lifespan Considerations

There's an interesting looking, forsaken structure on a back road not far from our offices, which fifty years ago was new and someone's very nice home. Now it stands unoccupied and unkept. Many years of neglect changed that lovely house into a dilapidated wreck that is probably beyond salvage at this point.

Obviously, this structure, like so many American homes, had poor wearability and a very limited lifespan. If you're building a dream home, is it wise to invest in one that wears so poorly?

Dream homes are for long-term occupancy. Most people don't build a dream home if they plan to live in it for just a few years; they buy a tract house or build something more modest.

Now consider this: as we age, so do our homes. When people first move into their dream home, generally, they're in their prime. They're in good health, both

"Eagle's Eye," built in a forest 45 miles west of Cincinnati, OH, has 5000 sq ft. Owners say it combines 11th Century architecture with 21st Century technology.

physically and financially—able and willing to live in and care for the home they love.

Time usually alters such situations. People get older and lose some amount of physical ability. Their financial status often changes. Their children and friends often move away.

Meanwhile, the dream home they still love and want to continue living in also ages. It continues requiring at least its usual amount of care.

Since such scenarios are not uncommon, why would anyone want to build a dream home with poor wearability and a short lifespan? There are alternatives. We think the Monolithic Dome—if not the best—is one of the best alternatives available to home buyers.

Snow covers the visible part of this earth-bermed dome, making it almost invisible. But inside, the family enjoys this 3200 sq ft dream dome built into the side of a butte in Menan, Idaho.

chapter seven

Underground Homes—Good or Bad?

Has the idea of living in an underground home tempted you? If so, you're part of a growing minority. More and more people, worldwide, have already built or plan to build an *earth-sheltered* or *earth-bermed* home.

Understanding the ups and downs of building underground

Earth-sheltered homes usually have their tops and sides completely covered with earth, while earth-bermed homes usually have an exposed side and roof.

Many underground enthusiasts join local and international organizations for support, ideas and information. Most of these enthusiasts and their groups can readily spiel off what they see as the advantages of an underground lifestyle, and, surprisingly to some, our own U.S. Department of Energy (DOE) agrees.

"Robot Ranch," Ferris, TX — An elaborate door welcomes visitors to this dome built into the side of a hill. Its 4144 sq ft include two bedrooms and bathrooms, living area, kitchen, theater, office.

Advantages

Conservative energy use tops just about everyone's list. On its website the DOE says, "An earth-sheltered home is less susceptible to the impact of extreme outdoor air temperatures, so you won't feel the effects of adverse weather as much as in a conventional house. Temperatures inside the house are more stable than in conventional homes, and with less temperature variability, interior rooms seem more comfortable."

Other advantages cited by the DOE include protection against the extremes of Mother Nature, such as high winds, hailstorms, tornadoes, hurricanes and earthquakes; less susceptibility to fire; lower insurance premiums; less maintenance; natural sound-proofing; conservative use of land and natural resources.

To these, non-governmental groups usually add a few more advantages. Most say that a buried house provides maximum protection from not only natural disasters but manmade ones, such as explosions, nuclear accidents, burglaries and break-ins.

Many claim that earth-sheltered homes are the only way to gain total privacy. Still others like having the ability to grow their food on top of their house.

Monolithic Dome vs. Underground

But a Monolithic Dome home—by its very nature—already has most of those advantages without being buried. Think about what the DOE says about earth-sheltered homes. They could be describing any unburied Monolithic Dome.

On the other hand, some people want the added security and privacy of an earth covering. There are folks who like the idea of a house that does not change the natural landscape or deplete our tree supply. Still others might want a really real roof garden.

An underground Monolithic Dome

Fortunately, for those who want to, it's very possible to build a Monolithic Dome underground. It's already been done. We have a number of buried domes. Some have an earth covering of 15 feet. Monolithic Domes have the strength to bear this added weight.

Monolithic Domes generally need very little increase in thickness and rebar size to be buried. Usually another inch or two of concrete and a size larger rebar will take care of all the structural considerations.

But the footing has to be quite a bit larger since the weight of the dome plus the earth cover will try to push it into the ground. Consequently, burying a Monolithic Dome usually increases its construction cost by about 20 percent.

This earth-bermed home includes two interconnected domes: 60' x 22' and 50' x 16'. It began as a project to design Monolithic Dome homes that blended into the natural environment of Rustler's Hideout on S. Menan Butte, ID. On a very cold day in Oct. 2007, a severe storm cut power to 5000 homes for 14 hours. The owners of this home had their neighbors shelter in their all-electric dome that retained its warmth.

Before

After

Buffalo, TX—On a forest-like site, the placement of an underground dome was planned so that the natural environment remained virtually undisturbed.

Condensation and Insulation

While the added weight of an earth covering may not seriously challenge a buried structure, condensation will. When any underground house fails it's usually due to condensation on the inside, since such moisture becomes feed stock for mold and mildew.

American pioneers built storages and shelters underground. First they built them with rocks, logs and straw. Later they started building them with reinforced concrete, but they all suffered from the same problem. They were always dank and damp and had mildew growing inside.

But what causes the condensation? The culprit is insufficient insulation. The earth's temperature tends to stay about 55°F. If you take warm humid air, bring it inside, and run it up against a wall surface that is 55°F it will condense.

Any home that's buried has to be super-well insulated. We have two reasons for insulating. Primarily, we want to contain heat by keeping it out or in. But in an underground home, we also want to keep the surface temperature of interior walls and ceiling approximately equal to the temperature of the air inside the structure. That takes a lot of insulation, but not insulating properly will invite condensation.

A glass of ice water

So the most common cause for failure of underground houses is not gross heat escaping the structure but an interior surface temperature that allows condensation.

A glass of ice water sitting on a table demonstrates this principle: The ice water obviously absorbs heat from the room, and if there were millions of glasses of ice water they would cool the room. But there's only one.

Still that one proves the axiom: opposites attract. The heat in the room is attracted to that glass of ice water, and since the surface temperature of the glass is far below that of the room, moisture condenses and begins running down the glass.

An underground house can be compared to that glass of ice water. Moisture in the air condenses when it contacts cool outside walls. Though there may not be enough moisture to run, it will be enough to attract mold and mildew.

"Invisible Dome" in Texas — A lighted tunnel made of corrugated steel has a concrete pathway that leads to a door that opens onto seven interconnected domes with a 3000 sq ft living area.

The only answer is to have enough insulation so that the interior surface temperature of the walls equals the temperature of the air inside the house. Three inches of urethane or six inches of Styrofoam should be used. And even with super-insulated walls, it's sometimes necessary to dehumidify.

In the "Invisible Dome" walls have murals depicting a room's theme. This master bedroom features a Mayan temple and artifacts.

Obviously a Monolithic Dome can be sufficiently insulated to prevent condensation. But before you begin looking for your shovel, you might consider a few other factors. Even the most enthusiastic proponents of underground construction say that getting financing is a problem and resale is almost impossible.

Code Compliance

No code stops you from burying a house, but there is a code that makes it quite miserable. The International Residential Building Code states that all sleeping spaces must have a window to the outside.

That window must have a clear opening of 5.7 square feet, a minimum dimension of 20 inches, and be no more than 40 inches above the floor. Since every bedroom must have a good-size window that opens to the outside, it's virtually impossible to bury a bedroom.

Some have been built with large window wells outside the bedroom to allow egress, but in reality that is not very practical.

"Hobbit House of Montana" — This Tourist Home was built into the side of a hill. Its 1075 sq ft encompass living/dining area, kitchen, master bedroom/bath, small bedroom, laundry area. Hobbit House and its Shire were planned to look and feel like Hobbit land.

Other Factors

The DOE says that soil type is another critical consideration. They say the best are granular, such as sand and gravel, since they compact well but are permeable and allow water to drain quickly. Cohesive soils, such as clay, and permafrost areas are least suitable for underground construction.

Other factors cited by the DOE include radon, an invisible, odorless radioactive gas produced naturally when uranium in rock decomposes; the groundwater level at a chosen building site; and the selection of an adequate air exchange system.

Advice

For all these considerations, the DOE recommends appropriate testing and consultations with professionals.

Monolithic recommends that anyone interested in building an underground Monolithic Dome take ample advantage of the information and resources we have here at MDI.

"Cloud Hidden" in North Carolina — Its three levels include 5300 sq ft of heated living space, 2000 sq ft of unheated living space, and 1000 sq ft in a two-level porch. The central living area has a cultured stone fireplace: 8' x 4' x 25'.

chapter eight

How do you beautify and decorate a home that's *round*?

Going from bare to beautiful: Have you ever stopped and looked at a house that's just been completed, but not yet beautified? The structure is there, but with nothing around it, so the house looks sad. Kind of like a lonely orphan just waiting to be adopted.

The Monolithic Dome has a beautifying potential equal to that of any other house.

I see the house at this point as being in its bare stage. All houses go through a bare stage. It doesn't matter what shape, size or style they are. Whether it's a rectangular, traditional structure or a spherical Monolithic Dome, when it's just sitting out there—*unenhanced, unbeautified*—it does look bare and lonely.

Fortunately, a dome's bare stage need not be a permanent one. Some people think that because of its curved lines, a dome's exterior look cannot be complemented. Others sometimes think

that the dome cannot be enhanced with products normally used for traditional houses. Neither impression is correct.

The Monolithic Dome has a beautifying potential equal to that of any other house—using the same products and methods used for any other house.

On the Outside: Curb Appeal!

How does a just-completed Monolithic Dome evolve out of the bare stage into a beautiful dream home with what real estate agents call *curb appeal*?

The answer is with the planning and use of structural facets at various levels, landscaping, and an exterior finish. Some dome features, such as multi-dome intersections and augments, must be planned for, included in the original design, and made a part of the Airform.

But other enhancements, such as window overhangs, landscaping and exterior finish can be added after a Monolithic Dome is completed.

Structural Facets

Simply put, structural facets at various levels means that everything on or around the dome is not the same height.

Let's say that you're planning a dream home consisting of two or three joined domes. For the greatest eye appeal, you would not want the domes all at the same height. Instead, the main dome, or the one with living, dining and entertaining

Harrisonville, MO — In 2001, a retired couple decided to downsize from an expensive, conventional home with 2000 sq ft. They built an energy-efficient dome with 1200 sq ft that comfortably accommodates all their needs.

areas, would be higher than the dome or domes encompassing bedrooms, office or recreational space.

This height difference makes the taller dome the more important one. It becomes the focal point that automatically attracts the eye. In a way, the height variety organizes what we are looking at. It eliminates chaos and makes us comfortable with what we see, and gives the home curb appeal or eye appeal.

Enhancements surrounding windows and doors also add eye appeal. At Monolithic, we have detailed information on the design and construction of window and door augments.

Other structural facets that add variety and interest to a home, both practical and purely aesthetic, include planters, fences, walls, bridges, columns, etc.

Entering your home site

Unless you prefer concealing it, plan an entry onto your property that's easy to find. Decide on the shape (circular or straight), length and width of your driveway.

Wet weather conditions common to your area could influence this decision. For example, if you have rains that result in lots of standing water, you might want a wider driveway for convenient turning and backing.

Parking

Plan adequate parking space. People who hold large family gatherings or entertain large groups, need parking for more than the family's vehicles.

Box Elder County, UT — Working by herself, from bottom to top, one section at a time, the owner enhanced her 32' x 18' elliptical dome with natural looking rock.

Walkway and Front Door Entrance

Design a path that can be comfortably negotiated from the car to your front door. Opt for a front door entrance that is clearly recognized, especially if your home has two outside doors relatively close to each other. Not knowing which door to knock on makes folks uncomfortable.

Plan a non-claustrophobic, sheltered porch or entranceway for guests to stand in while waiting for the door to be opened. Avoid a design that forces people to back

down steps before they can enter your home, and avoid steps that are either too narrow or too wide.

Landscaping

Some professional landscapers say that all residential landscapes include three parts:

1. the front, curb appeal area or what people see when they pass your home;
2. the backyard or family area;
3. the hidden or utility area for a garden, trash cans and storage shed.

That makes sense to me. It also shows that there's more to landscaping than what meets the eye. But it's only that area which does meet the eye that I want to talk about here.

Landscaping the front often includes planning the placement of trees, shrubs and bushes, plants, flowers and turf. There's much to consider—the size, shape, growing pattern, area suitability and color of each. And it all has to be researched and planned in advance.

While the research sounds like and probably is rather tedious, planning the placement of your growing, front yard enhancements is fun.

Keep this simple rule of thumb—your green thumb—in mind: your Monolithic Dome dream home should be the focal point of the picture you create. Here's another way to think of it:

Your dream home is like the climax or crescendo of a fine piece of music. All the

landscaping elements you will use—the grass, flowers, plants, shrubs, bushes and trees—are like the musical notes that with repetition and variety lead to the climax.

So, you might say that you start with the softest, shortest, but most repeated note—the grass. That gets backed with elements that gradually increase in height and size—flowers, plants, shrubs, bushes, trees. The result will be a sort of pathway or funnel leading the eye to the dome itself.

Exterior Finish

Providing an exterior finish, of some kind, over the Airform need not be done immediately. But the dome owner should consider an exterior finish—especially for a dream home—for two important reasons. One is practical and the second has to do with the look you want to create.

Belk, Poland — In 2000, Monolithic Construction of Poland built this two-story dream home. It has a diameter of 50' and a living area of 2500 sq ft. In 2007, the owner cleaned and painted the Airform.

Maintenance

Sunshine and weather eventually will destroy an unprotected Airform. If that weathering process is not stopped, it will, in time, get to and deteriorate the polyurethane foam—not a desirable situation. But one that can be totally avoided by coating or covering the Airform.

The Look

There's a wide variety of coatings and coverings available. What you choose should reflect the look you wish to create. For example, if you want a country look, you might consider flagstone, rock or brick placed over the dome to about eave height; the remaining dome surface could be protected with a liquid coating.

On the other hand, if you want a southwestern look, you probably would want a stucco or concrete finish. Metal cladding is yet another finish alternative. Or, you may simply want to paint the Airform.

In our reference library at Monolithic, we maintain detailed information on each of the exterior finishes we recommend.

A front foyer with a ceramic tile floor and curved walls welcomes guests. The light through the half-round window brightens the central 40' dome.

On the Inside: *The* Look and Feel

In the "Introduction" to her book, *How to Decorate*, Martha Stewart says, "What I have learned, after designing and decorating five homes, is that decorating is something one can learn to do...."

I believe that. With that conviction in mind, what we're presenting here is not a step-by-step guide on interior design. Instead, here are some important concepts for you to think about, as well as advice and suggestions from those who have successfully enhanced their Monolithic Dome dream homes.

Creating Comfort and Getting Beauty

We're back to the concept of beauty, and to the idea that beauty is not so much what we see as what we feel.

People do not think a place beautiful if they don't feel comfortable in it. We might even say ***comfort is beauty and beauty is comfort.*** That, I think, should be foremost and constant in the mind of any interior decorator or dream home planner and should dominate every choice made.

Here are three questions that should be asked and answered before any major decorating decision is made for any area or room:

1. What do you like and what makes you feel good?
2. What do the other family members like and what makes them feel good?
3. How will this area or room be used?

Color

Colors definitely affect our comfort zones. The color of a room can make a person feel cheerful, depressed, stimulated or tired. There are studies indicating that colors used on the walls of a factory, office, or schoolroom can significantly increase or decrease productivity.

Blue, say the color experts, calms a person and inspires trust. A pastel green has a similar effect. No wonder these are such popular choices for the examining rooms of doctors and dentists!

Red stimulates the heart and appetite. Ever notice how many restaurants use red?

Dark green suggests prosperity and trust—a popular choice of banks.

Yellow is cheerful. It draws attention, but when too intense yellow can cause anxiety.

Generally speaking, most people are comfortable when

Colorful rug accents living area of this dome in tornado-prone Chipley, FL. Owners say the dome makes them feel safe and serene.

the walls of large, much used rooms are mostly done in light or neutral colors. Many people find intense or dark shades over large areas in rooms where they spend a lot of time overwhelming and depressing or too stimulating.

But intense color has its uses; it can accent a small area very effectively. If you have or know what furniture will go in a particular room, there's an easy, practical and proven way for choosing colors for walls, window and floor coverings.

For example, you can select colors or shades of a color from a living room sofa, chair or even a pillow done in a print or color pattern. A light or neutral shade found in the fabric usually works well for walls, with a slightly deeper shade for windows and a still darker one for floors.

In the same way, you can select colors from a favorite painting or picture that will grace the wall of the room.

Lighting

When it comes to comfort and beauty, color and lighting work—or should work—hand-in-hand. Lighting should enhance rather than destroy color.

The right lighting can soften the intensity of dark walls for instance, making a small reading area cozier and more inviting.

On the other hand, poor lighting or the wrong color of lighting can make a room dull, even ugly. Imagine what a pink glow might do to misty green walls.

How a particular space will be used and by whom should play a major role in

This third-floor bedroom has a comfortable conversation or reading area and a great view.

deciding lighting. Conversation and relaxation areas need soft, subtle lighting.

But work, study and reading areas need more intense illumination, so people are comfortable and efficient working there. Keep in mind, too, that older people may need more lighting than younger folks.

Organization

Every nook and cranny of a room does not have to hold something. Resist the temptation to fill every space. Open spaces complement the occupied ones.

Squeeze a dramatic piece of furniture between other objects, and it loses its drama. But surround it with open space and like a magnet it draws the eye.

Your comfort and the comfort of those using a room are the key to successful furniture arrangements.

For example, conversation areas need upholstered furniture—usually a sofa and

two or three chairs—that are kind to our bodies, some table surface and soft lighting. The arrangement should invite conversation.

Most people feel comfortable with seating in a semicircle that's neither too tight nor too expansive. We usually don't like having another person closer than three feet or further than five to seven feet. We want eye contact, but we also want our personal space.

On the other hand, we don't want to shout at one another. Seating placed with three to seven feet between usually works best.

A spiral staircase leads to the loft that circles 2/3 of this dome's interior. The loft has space for two more bedrooms and a bath.

Organization, I think, means more than furniture arranging. The proverb *A place for everything and everything in its place* comes to mind. It fits well with the planning of a dream home's interior because most of us simply are not comfortable with chaos and clutter—except for adolescents and teens, of course.

Here again we need to consider how a room will be used. For example, today's bedrooms are no longer used just for sleeping and dressing. We watch TV, exercise, read, write, work and eat in our bedrooms.

This fabulous dream home sits atop a ledge of the Colorado Rockies. A finely crafted, redwood deck has a walkway that embraces the dome and seems to reach into the treetops.

Bathroom usage has changed also. Modern bathrooms might include showers with benches, spas, exercise equipment and elaborate grooming areas.

The more a room is used, the more it must hold of both large and small objects. And if those objects are not accommodated, chaos and clutter result. So for a room with a lot of activity and objects, include storage in the planning of its décor.

For instance, a bedroom you will want to read in probably could use a bookshelf. And a small cabinet or dressing table with drawers might be just the thing for a bathroom with lots of grooming paraphernalia.

The Voice of Experience

In working on this chapter, we recollected our own interior design experiences with our Monolithic Dome homes. We also talked with planners and builders of other dream homes—people now living in Monolithic Domes they designed and enhanced. They gladly shared their suggestions.

Some of that advice, I think, is quite unique. On the other hand, some was voiced by almost everyone we interviewed. But whether unique or common, I feel these suggestions are all valuable.

Floor Plan

Choose one that flows for you and your family. Consider your family's activities and the traffic patterns that activity creates. For most people, rooms radiating off the

Natural woods add to the casual, comfortable atmosphere of this family room.

most frequently used area, such as a large kitchen or great room, work well.

That kind of a plan allows direct passage from a common family area to individual bedrooms and bathrooms without walking through other rooms.

Entrances

Consider the traffic patterns your family will establish going in and out of the house. Practical home designs usually include a front entrance used mainly by visitors and additional ones just for the family.

A side or back entrance, for instance, is most convenient when it's placed so that family members can easily and quickly come in from the garage or carport and enter the house through a mud or utility room.

For families who enjoy patio or backyard entertaining, wide patio doors leading directly onto the patio area are a must.

Versatility

Think about the future use of rooms and their placement, size and versatility. Right now you may want a formal dining room, but will you always? In time, that formal dining room may become a rarely used or never used area.

You may then want to make the dining room a den, library or hobby room. Because families change, it's wise to design a dream home with ***flexibility: rooms of a size and with a window arrangement suitable for more than one use.***

Priority List

Make a list of those things most important to you, for which you are willing to pay a premium price if you must. That priority item might be something major such as the exterior finish of your dome, or something small.

A priority list of one dream-dome builder included a special kitchen sink faucet, designed to stand higher so that large pots easily fit under it.

Another listed long rather than short windows. Still another insisted on tile floors and colorful area rugs rather than wall-to-wall carpeting.

Stick To Your List But Be Flexible

What sounds like a contradiction is really sage advice. Here's the best example shared with us. A couple wanted a fireplace in their great room, but were discouraged from including a conventional, wood-burning one because a Monolithic

Dome, by its nature, is so energy efficient and tight.

Nevertheless, they wanted a fireplace in their dream home. The compromise was finding an electric fireplace that duplicated the look of a wood-burning one and could be incorporated into a wall just like a wood-burning fireplace.

Accommodating Existing Furniture

Most folks, from necessity as well as personal choice, prefer to keep furniture they already own and use it in their new home. If that's the case, it's wise to plan with that furniture in mind.

For example, one family owned and loved a huge entertainment center; they made sure that the dividing wall in their family room was of a width that could attractively accommodate the entertainment center and that it was positioned for comfortable viewing and listening.

Style

Most of our established dream-dome occupants had something like this to say about the furniture and fixture style for the interior of a Monolithic Dome:

A dome is not limited to any one style. You can choose whatever you like and want, including provincial, country, southwestern, western, modern, etc.

Your dream home is an extension of you; it should reflect you and, by all means, be an environment pleasing to you.

Furniture Placement

Generally speaking, interior decorating principles applicable to a conventional structure are just as appropriate and work just as well in a Monolithic Dome.

Sometimes, people considering a dome worry about *"all those curved walls. You can't put flat furniture against a curve and you can't hang pictures on a curved surface."*

"Charca Casa" — Soft, billowy bed cozied against a wall invites relaxation.

That's a needless concern. Only the outside wall of a dome is curved; interior ones are usually straight and flat. Because the curved wall is the outside wall, it's the one with the windows and doors.

Large objects such as paintings and prints are rarely placed on outside walls. Then too, there are dome designs that reduce or eliminate the curve. For instance, in a dome with a stemwall the ceiling curve starts higher, usually above eight feet.

The *Orion* design with its outside wall consisting of a series of connected straight walls entirely eliminates the wall curve and provides yet another alternative.

Many people find that a curved outside wall creates the illusion of even more openness and space. In fact, interior design books, magazines, and TV programs encourage furniture placement that rounds out a square wall for an illusion of greater space. With a dome, that roundness is already there.

Sangre De Cristo Mountains of Colorado — This living room has a rustic but warm, inviting look.

A curved wall also tends to dwarf whatever is placed against it. In other words, placing a massive cabinet, bureau, or bookshelf against the curve makes it look smaller. Moreover, such a placement often gives the room an attractive yet practical focal point.

A large, flat furniture piece against a curved wall automatically creates a relatively generous gap behind it—one that can be easily used for storage.

In fact, one dome owner did just that. She positioned a china cabinet against the outside wall of her dining room. Behind that cabinet, she stores a folding table and chairs often used for additional seating. On either side of the cabinet, she placed tall pots of silk greenery that can be easily moved but that hide the gap and knit it all into one eye-appealing unit.

Walls

Again, any wall treatment you might use in a conventional home can be used in a Monolithic Dome, including paint, wallpaper, tiles, glass, brick, stone, murals and moldings.

In fact, a Monolithic Dome provides greater creative opportunity than most traditional homes. Within its relatively uninterrupted interior and high ceiling, you can create just about any environment you dream of inhabiting. You can design your dream-home-come-true.

General Design Guidelines

Symmetry

Symmetry gives the Monolithic Dome its beauty and its natural advantage of simplicity with strength. Consequently, the best designs work with that symmetry, not against it, on the inside of a dome.

So how do we do that? How do we subdivide the symmetrical interior of our dome into practical and aesthetically pleasing areas and rooms? Here are some proven, basic principles:

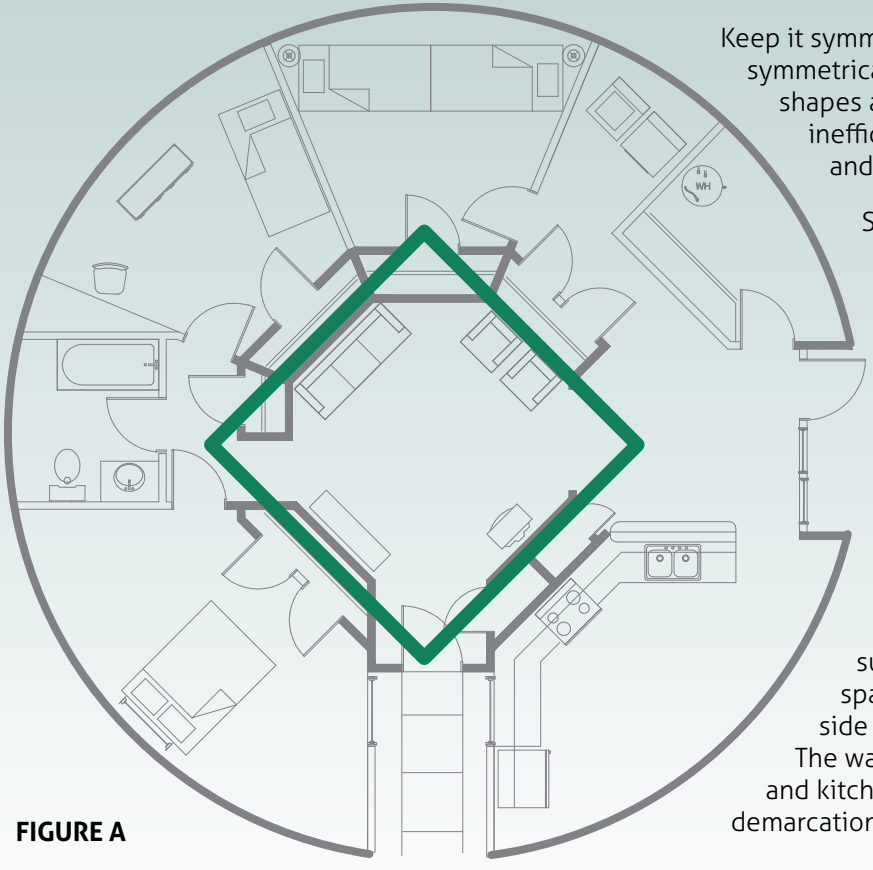


FIGURE A

Keep it symmetrical. Avoid dividing symmetrical space into odd corners, shapes and angles. Such spaces are inefficient, add to construction costs, and are unattractive.

Separate different shapes. Don't mix circles with rectangles and squares. Instead, use a line of demarcation between round and cornered shapes; position all circles on one side of the line and all rectangles and squares on the other.

Figure A illustrates this principle. A large, rectangular living room dominates the dome's center. Space on one side of the living room is subdivided into cornered rooms; space on the living room's other side becomes a semicircular kitchen. The wall between the living room and kitchen creates a natural line of demarcation.

Align to Radius

All circles have a radius point or center that's easy to find. Imagine a builder trying to determine the placement of rooms on the inside of a structure that has no corners. It's virtually an impossible task, unless the builder finds and works with the radius point.

Interior wall placement is equally important. Interior walls that intersect the dome's outer wall should be placed at a ninety-degree angle or perpendicular to the outer wall.

Figure B shows alignment to radius and perpendicular wall intersections.

Use the dome's center for its dominating area. A Monolithic Dome's greatest volume of space and its focal point is at its center. You and your family's lifestyle should decide what that focal point should be.

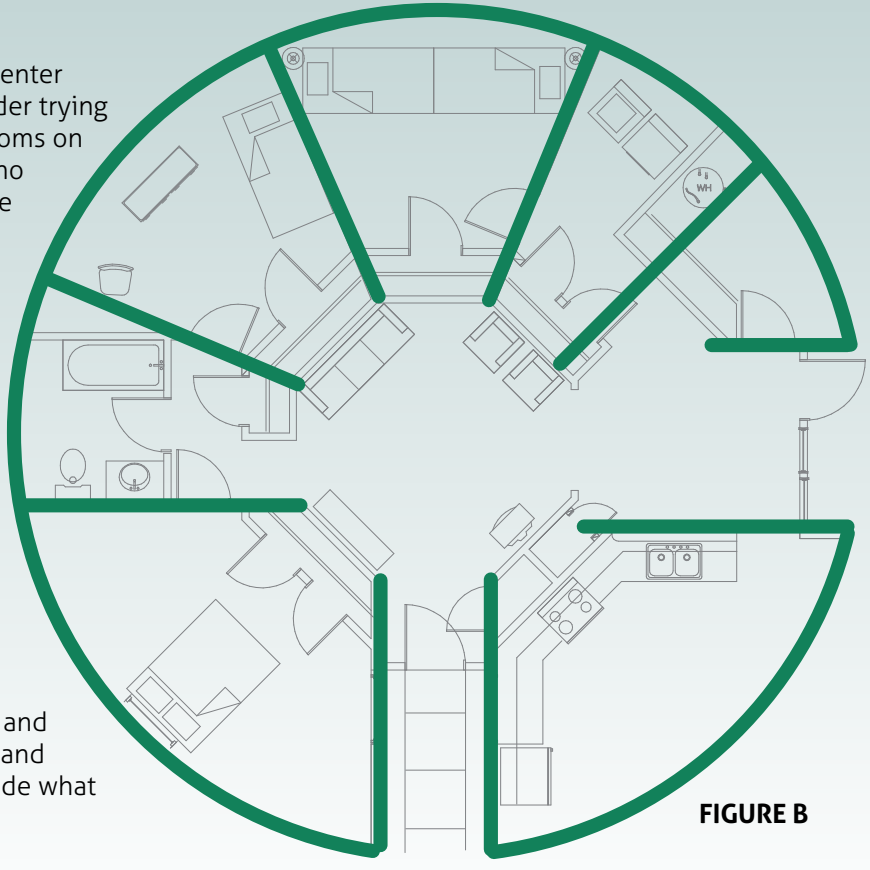


FIGURE B

This dream home has three interconnected domes: center dome is 40' x 17' and outer domes are 34' x 15'. The interior has 4000 sq ft. The exterior is finished with stucco and skirted in stone.

chapter nine

From Dream to Goal

What is a dream? According to my *Thesaurus*, it's a fantasy, a vision, a wish—in other words, not something very substantial. But it is a beginning. And it's an appropriate, important beginning for a dream home.

If we fail to plan, we plan to fail.

Yet, we reach a point at which that dream of a home must gain substance; if it doesn't, eventually it will just die. So the question is, ***How do we do that?***

One way is by turning that dream into a goal, and we do that with planning. Planning is vital: ***If we fail to plan, we plan to fail.***

The Planning Process

When it comes to planning a dream home, a practical way for turning your dream into a goal is by carefully considering and answering some important questions as specifically as you can.

What follows are such questions, along with some of our considerations and comments on how your answers might relate to building a Monolithic Dome dream home.

Where do you want to build your dream home—what state, city or town?
Monolithic Domes now exist in just about every state, so the state is not a problem. What might be a problem is selecting a homesite within a densely populated urban area.

Some subdivisions have more restrictions and are more prohibitive about what you can build. Such restrictions often govern not only the size but the style and materials used in building a home.

Rural areas and small towns often are less restrictive, more welcoming and easier to deal with. Each specific location may be different and must be checked.

Then too, many people who want a Monolithic Dome dream home want a larger lot or some acreage. Such sites are more available and usually more attractive in rural rather than urban areas.

What is the climate in your selected area?
The answer to this question will help determine the size and type of heating/cooling system best for your dome. If you place your dome atop a mountain, you might need no air conditioning, or simply a very small unit. Conversely, if you decide to build

"Xanadu Island Resort," Belize — This Monolithic Dome has three fully furnished apartment suites.

in the desert, your Monolithic Dome might not require much heating.

What size dream home should you build?

Our advice is: *Don't build bigger than you need and can comfortably manage.* Bigger is not always better—especially when it comes to houses.

The really smart home planner invests in superior building materials and quality fixtures rather than sheer massiveness. Sometimes, dream-home builders fall into the creating-an-impression trap; they build a house that's really big, and it is impressive. But that impression lasts only moments.

Meanwhile the financial burden goes on for years and often creates serious money problems for the owners.

But what if you want a really big dream home?

Some people want, need and can comfortably manage dream homes with 5,000 or more square feet of living space. If that's your situation, then by all means ***go for it!***

And if you do want a really spacious home you could not do better than selecting a Monolithic Dome design. These designs are ideal for wide open expanses that often are too costly in conventional structures.

The designs that I prefer for truly huge homes use a series of connected domes, each with its own specialty.

For example, in addition to basic living quarters, you might design a dome with an indoor swimming pool for year-round use and enjoyment. Another dome could house exercise and/or game equipment. You might even make one into a two- or three-lane bowling alley.

Individual domes could also be designed as guesthouses, workshops or offices. With Monolithic Domes the possibilities are virtually limitless. And practical too, since security is such an important factor these days. When not in use, individual domes can be locked and closed off from the rest of the complex.

Who will be living in your dream home? Adults? Children? Senior Citizens? Individuals with special needs?

A good way to decide on home size is to think and plan in terms of who will be living there, what does each person need and want, and what is the family's lifestyle.

"Yumadome" in AZ — It's a multi-generational dream home 84' x 40' with 11000 sq ft divided into eight suites, all off the atrium.

For example, a teenager might require a larger bedroom than a baby. On the other hand, you might plan a nursery that later converts to a teen's room.

If the family includes seniors or someone with a special need, that too should be considered. Stairways might not be manageable for an elderly or handicapped person. In that case, including an elevator, building a larger one-story home, or attaching a smaller dome to the main one might be more practical.

Then there's family lifestyle. People who like formality or do a lot of formal entertaining usually want their dream home to include formal living and dining areas. But folks who enjoy living more casually might prefer a great room divided into entertaining and play areas instead of a formal living room.

And rather than a formal dining room, a large kitchen comfortable for both guest and family meals may be their choice.

Some families might even want a combination of the formal and casual—formal living and dining rooms for entertaining, plus a great room and big kitchen for everyday family activities. But, again, we caution against overbuilding.

A current trend—and it's a wise one—is building only what you need and designing multipurpose rather than single-purpose rooms. Many of us have known, for a long time, that a guest bedroom, on a daily basis, works well as a hobby room or office.

But we don't often think of designing a dining area formal enough for special occasions, yet practical enough for daily meals. These days, beautifully designed dining

furniture made of durable, easy-to-care-for materials as well as practical window and floor coverings make such rooms possible.

Similarly, including cozy conversation areas in the great room could eliminate the need for a company-only living room.

At "Cloud Hidden," you can walk through a curved archway and into a breakfast nook that makes you feel like you're dining in the treetops.

"Antelope Springs Ranch" — A craftsman, walking a wheelbarrow over the land, collected rocks and assembled a wall that covers the dome and structural additions.

What's best: Single-story? Multistory? Basement? Single dome? Connected domes?

Here again, the needs and wants of the individuals as well as family preferences should play a major role in deciding. Small families of only adults or just one or two children usually prefer single-story dream homes. Such groups enjoy the closeness of a one-level home; they like sharing space and activities.

If there is a need for more space, one or more smaller domes connected to the main dome is usually the most comfortable solution.

Large families, particularly those including various ages, often want and need more separation. A multistory dome is one way of providing it. But you might also consider two or more connected domes instead of the multistory.

Stairways can be a dramatic and very attractive feature of a dream home. But if people living there cannot comfortably manage that stairway, it soon becomes an unwelcome eyesore.

You might also find the expense of building a stairway prohibitive. The cost involves more than just the lumber required. It involves the square footage of floor space used on two floors.

For instance, a three-foot stairway needs approximately 50 square feet on each floor—a total of 100 square feet. The price of a square

foot multiplied by 100 is a substantial amount!

Still, some dream homes just cry for a second or third story. Some Monolithic Dome dream homes we've designed and built sit atop sites with spectacular views—best enjoyed from the bedrooms or balconies on their upper levels.

Some people really like basements. At Monolithic, we advise folks to really think about their need for a basement. If its purpose is only to provide storage or a laundry area, there are more practical, less expensive alternatives.

For example, storage areas can be designed into the main dome. Or, a small storage dome can be built as a separate unit or a garage attachment. Likewise, laundry appliances can be accommodated in a mud room, bathroom or kitchen.

On the other hand, for families wanting a rumpus room for active, noisy children and/or adults, a basement might be the answer. But then so might a smaller rumpus dome! Once the children grow older or the rumpus activities diminish, the smaller dome could be converted easily into guest quarters, an office or hobby area.

How many bedrooms and bathrooms to include? What size? Where placed?
Typically, the modern American home includes a master bedroom and bath, plus a bedroom for each child and one or two additional bathrooms. That's a good plan—an easy decision.

Deciding on the size of each room is a bit more difficult. We suggest really paying attention to bedrooms and bathrooms you have already seen and like. It might

be the master bedroom at your father-in-law's house or a child's room at a friend's home.

Measure that room; jot down what it is that you particularly like about the room. You might be attracted to the master bedroom's generous windows looking over a pond, a built-in bench in a spacious shower, or a computer and study area in a teen's room.

Really analyzing what it is you like or dislike about a room, what makes you feel good, and what size room you prefer will help immensely in the design of your dream home.

Think also about what you want to include in each bedroom. For instance, do you want an inviting conversation or reading area in your master bedroom? How about exercise equipment—will that go in the bedroom or possibly master bathroom? How many closets are needed in each bedroom?

Parents sometimes plan bedrooms with spacious play areas for young children, in hopes of confining toys and activities to that area. But small children like being where their mom or dad is. It might be wiser to plan a larger kitchen with room for toys, or a small play area in another room where a parent spends a great deal of time.

The placement of bedrooms takes planning, too. Parents with small children usually want the children's bedrooms near the master bedroom. However, the reverse may be true for families with teens or grown offspring. They may prefer separating

"Callisto" in Italy, TX — This 50' x 16.5' dome reflects itself in the sparkling pond just a few feet from its patio. The home's 1964 sq ft include a living area with a wall of windows that lightens and enlarges the interior. A great room, sitting room, office, laundry, three bedrooms and two bathrooms encircle the kitchen.

Easy-to-reach preparation areas and hanging cookware make this kitchen an enjoyable workplace.

A girl's bedroom with lots of frilly pink. The built-in bunkbed is a queen bed on bottom and twin bed on top.

bedrooms by placing them on opposite sides of the dome, on different levels, or in separate domes.

How large a kitchen should you plan?

Monolithic Domes encompass generous amounts of uninterrupted space. That makes it easy to design a kitchen as small or as big as you need and want. Today's kitchens are no longer just a line of appliances, counters and a sink.

A modern kitchen can include a hobby, office, TV, play, laundry or gardening area, as well as breakfast bars for quick lunches or dining furniture for family dinners.

How big should the living room be?

Remember the living rooms of grandma's day that were seldom lived in? Fortunately, that's not the case anymore. Today's living rooms and great rooms are designed for use. And like modern kitchens, in a Monolithic Dome they can be just about any size. Whether you choose living room or great room, you will want it to fit your family lifestyle and the way in which you like to entertain.

We suggest you make a list of just how your family uses your current living room, what you like about that and what you need to change. Then plan the new one.

There are no hard and fast rules. Make it cozy and small—or design a spacious area with separate furniture groupings for conversation, game playing, reading, TV, etc.

Planning a dream home is fun—and a lot of work. But it's worth the effort. At Monolithic, we always encourage careful planning.

In fact, we suggest you plan your planning!

Plan on starting a personal *Dream Home Notebook*, with your answers to the questions presented here. Plan on carrying a tape measure and that notebook with you. Plan on actually measuring rooms and noting features you particularly like.

In the long run, you will be glad you did, because by doing so you will complete much of the decision-making process.

Planning Help at Monolithic

We've developed three special *tools* at the Monolithic Dome Institute to help people with their dream-home designing.

Tool 1: Word Picture

What is a ***Word Picture?*** It's a written description of what you, the dream-home planner, want.

An effective Word Picture is well thought out and detailed to the point of describing the rooms, views, ambiance, etc.

Ask and Answer

Start by asking yourself and your family members those all-important questions presented in this chapter.

Be sure to get everyone's input. You may be surprised by some of it. I've talked with many, many couples that, at the start of planning, did not see eye-to-eye. Planning time is the best time to get those differences aired and settled.

Measure, Measure, Measure

Be sure to take your tape measure and notebook with you wherever you go!

It's extremely important to provide measurements for any and all rooms. Measure your present bedroom. Is it the right size for your dream home or should it be larger or smaller? If you like your neighbor's bedroom, measure it.

Measure living rooms, kitchens, bathrooms, play areas that you like. Wear out that measuring tape and describe the rooms you want in feet and inches.

Providing measurements is the best way to get what you want. It's almost impossible to draw plans just with what you envision.

Room Arrangement

In your Word Picture describe which rooms you want next to each other. Do you want the baby's nursery next to the master bedroom, or do you want it down the hall? Do you want a formal dining room? If so, do you want it immediately adjacent

to the kitchen? Do you want a great room? Et cetera, et cetera, et cetera!

Activity

Describe what you want to happen in each room. Is the room for conversation, for a big screen TV, or for a dance? Each room has its own function.

Those functions can be multiple in nature. For some, a kitchen is just a room for food preparation. But others want it to include a casual—maybe even a formal—dining area. Still others may want their kitchen to include an indoor garden or a desk and computer or a play area, etc.

A dream home should never be designed just because someone else has done it a particular way. There should be a reason for the size, shape and scope of each room.

Don't ignore conventional design; work with it. For instance, a standard tub is five feet long. If you desire a larger one, this must be taken into consideration when planning the bathroom size. But keep in mind that non-standard items usually cost more.

Tool 2: Free Evaluation

For a ***Free Evaluation*** of the Monolithic Dome you think you might want to build, you need only supply us with your Word Picture and/or a sketch of what you have in mind.

Monolithic's professionals will evaluate this information and give you, the pro-

Ultimate privacy — This master bedroom features a canopied, fully curtained queen-size bed. Comfy sofa near the window invites conversation.

spective dream-home builder, a cost approximation. You can then decide to proceed with your plans or change them.

Tool 3: Home Feasibility Study

A ***Home Feasibility Study*** is much more detailed than the Free Evaluation.

It includes a floor plan showing necessary elevations, openings, notes, details regarding openings, and construction cost estimates. But, like the Free Evaluation, the Home Feasibility Study does not lock you into anything.

For clients who decide to continue with construction plans, the modest fee of a Home Feasibility Study is deducted from the price of their full architectural drawings produced by Monolithic.

Architectural drawings containing the necessary information for a contractor to complete your Monolithic Dome home can be completed by Monolithic at a reasonable cost.

When planning your Monolithic Dome, please allow six to eight weeks for completion of the drawings.

Either a Free Evaluation or a Home Feasibility Study takes approximately two to four weeks, depending on workload.

The 3800 sq ft of living space accommodate many interests: music, reading, conversation, etc. High windows fill home with light and give it an open, peaceful feel.

chapter ten

Options and Decisions

Let's say that you've done the preliminary research, found a building site you love, and even chosen the specific Monolithic Dome design you want for your dream home.

Your next major decision will probably be who will do the building. With a Monolithic Dome, three general options are available. Consider one of the following options or a combination of two or more.

Always ask for references and check them!

Turnkey Option

Simply defined, turnkey means that once a house is built, you, as the owner, need only turn the key and walk in!

In a turnkey arrangement, you contract with a developer or general contractor to handle all the construction details, material purchasing and the work itself. The general contractor builds the house for you according

to your plans and specifications.

A turnkey arrangement can be a wise choice—especially if you have no construction experience, or no interest in gaining any, or simply no time to commit to a demanding, lengthy, building project.

But—here's a word of caution. In a turnkey arrangement, the success of the project—your satisfaction—hinges on the contractor or builder you select.

To help you make a selection, on our website we maintain a list of builders with varying levels of Monolithic Dome construction experience. But we do not guarantee the work or endorse any particular builder.

Always ask for references and check them! If possible, ask to view samples of his or her work before hiring a builder to construct your dome.

You as General Contractor

This second option calls for you becoming your own general contractor. Your responsibilities would include—but not be limited to—researching and complying with all the legal elements, purchasing materials, developing a construction schedule, hiring subcontractors and labor.

It's definitely not an easy job. And probably best managed by folks who have some construction know-how and experience and who have supplemented that with one of our Monolithic Dome Workshops.

Remember too, that as your own general contractor, you will be dealing with

Ankeny, IA — Three interconnected domes with 4600 sq ft were built by 83-year-old Jack Boyt as a show house for green construction. This home is an "Orion," a Monolithic design of a dome-home with vertical, outer walls. (More on the "Orion" in Chapter 11.)

local people and their businesses, so knowing the folks, their customs, and the businesses in the area where you want to build can be extremely helpful.

You as Owner-Builder

In this option, you are the owner and the builder of your dream home.

As such, you have all the responsibilities of a general contractor, plus doing much of the work yourself.

This can be a long-term, serious commitment. It requires know-how, time, determination, physical and emotional stamina. But while it's a demanding choice, it's not an impossible one.

The Monolithic Dome Institute offers a number of helpful resources, including Workshops, Training Materials, and free, downloadable information on our website.

Protecting Your Interest

Building a dream home means making a serious, long-term commitment. For most of us, such a project is one of the biggest financial investments we make during our lifetime. Such a large investment needs protection.

While regulations governing house construction vary from area to area, the procedures and safeguards we've included here pertain to most locales.

We advise home builders to complete some of these procedures before they purchase a property. For example, it's wise to thoroughly research Zoning Codes,

"Eye of the Storm" — Kitchen features an eating island and work counter, built in opposite curves of Corian. Work counter has sink bowls molded into it, making it seamless and easy to clean.

Architectural Covenants, Deed Restrictions, Easements and Building Codes before you invest.

Plot Survey

A plot survey is a drawn, detailed description of your building site. It includes the outline, angles and dimension of your plot. It shows the location of structures, if there are any, adjacent to your property.

The plot survey also places permanent markers on the ground at each corner or angle of your site. We suggest that a local surveyor or civil engineer do your plot survey. Local people, familiar with the area, may have previously gathered data that could save you time and money.

Zoning Codes

These regulations, set by local governments, vary a great deal. Sometimes, neighboring subdivisions within the same city will have very different zoning codes. Codes govern the location, height and use of a specific piece of property.

Zoning Codes can allow or forbid the construction of a single-family residence, an apartment building, or any other structure at any particular location.

Architectural Covenants and Deed Restrictions

These restrictions govern what kind of house can be constructed on a specific lot. For example, the restrictions could specify what size or style of home can be built and/or which construction materials must be used. Depending on its location, a property may have many, complex restrictions or only a few, simple ones.

Severy, KS — This dome was built in 1979 for Boyd Stewart, an aeronautical engineer who wanted a tornado-safe home and decided on Monolithic after reading an article about our potato storages in Idaho.

Easements

An easement is a right-of-way that permits a person or company to go on an owner's land for a specific purpose. Utility companies often are granted easements so they can install pipes and wires.

But an enterprise such as an oil company might also have easement rights. Property owners may voluntarily grant an easement or be compelled to do so by local authorities. City-owned streets, water lines, sewers and alleys are examples of government easements.

Building Codes

The purpose of building codes is to establish construction requirements that protect our health, safety and general welfare.

According to the National Association of Home Builders (NAHB), building codes govern building materials, fire protection, structural design, light and ventilation, heating and cooling, sanitary facilities and energy conservation.

In the past few years, the International Code Council has developed an International Residential Code that's updated every three years.

Every American state has adopted the IRC, but since climate and environment have a lot to do with the types of houses people build, the IRC is adjusted by local jurisdictions, such as county or city building departments.

When built properly, Monolithic Dome designs meet or exceed all building code specifications in every region.

Building Permits

Most cities and counties require building permits. They vary from jurisdiction to jurisdiction. They can be complex, simple or not required at all.

A city or county building department makes sure that its building codes are followed by requiring building permits and inspections. If permits are required, a home builder must, by law, get the necessary building permits, before the start of a project. In fact, the permit is legal permission to start.

"Disappearing Dome" in Manitowoc, WI — This unique dream home has a 55' diameter and three stories. It overlooks Lake Michigan and on foggy days becomes almost invisible.

"Dome of a Home" — Owners wanted a hurricane-safe home. They built a Monolithic Dome that could withstand 300+ mph winds and tremendous storm surges.

Although a fee is usually involved, building permits are not bought, but applied for and issued. To apply, you need to complete a Building Permit Application and submit it with certain other documents.

These may include a copy of your deed, free of any deed restrictions that might prohibit building; a copy of your plot survey, showing the exact location of your site; a copy of your plan drawings and materials list.

We suggest you submit copies rather than originals and label each piece of paper with your name, contact information, and the block and lot numbers of your property.

Builders are notified once plans are approved. Then permits are signed, dated and issued, and fees are collected.

Important Note: The need for and the acquiring of a building permit varies greatly. In some places none is required. In other places the building permit is very expensive and a real lesson in bu-

reaucracy. Check, check, and double check for your area. Also, check for sanitation permits if individual systems are to be used.

Generally, permits are effective as long as construction progress continues during a specified time frame, such as every 100 days. Delays of six months or more could invalidate a permit.

A building department usually has some printed literature for the builder that tells if and how building permits should be displayed at the job site; how to arrange for inspections at the completion of various construction phases; whom to contact if you run into a problem or delay.

Certificate of Occupancy

In some cities, this is needed. This document verifies that your property meets the requirements of local codes, ordinances, regulations and required inspections. In essence, the Certificate of Occupancy is legal permission to begin residency.

Title Search

This is a complicated search that involves looking through stacks of documents for anything that might encumber the title to a property. That *anything* could be an old lawsuit, will, mortgage, or estate judgment.

Because it's a cumbersome job requiring certain expertise, it's best to go to an established title company through whom you can also get Title Insurance.

Title Insurance

It provides you with an important safeguard. Should there be any claim against your ownership, the Title Company must defend your right to ownership and cover the legal expense of the suit.

Deed

Property owners receive a deed to their property once the title has cleared. This deed should be recorded at the appropriate court.

Mechanic Liens and Lien Releases

These can create all kinds of trouble if not handled properly. An attorney may be consulted to help with contracts and payments. Certainly, someone familiar with Mechanic Lien laws should be involved, such as a banker, title company, or experienced builder.

How Monolithic Can Help

We want to educate and help folks interested in owning or building a Monolithic Dome.

At the Monolithic Dome Institute, we've established a number of helpful resources, including Websites, Workshops, and Training Material.

www.monolithic.com

Our website contains hundreds of pages of texts and photos relating to Monolithic Domes. It has illustrated, how-to information on specific projects; lively, informative, generously illustrated articles about completed Monolithic Dome homes, schools, churches, commercial and industrial facilities; think pieces; and news of new dome projects worldwide.

"Sweet Dome Alabama" in New Hope — This tri-dome was constructed using just one Airform that has three interconnected sections.

A Listing of Professionals

To help our clients find the professionals they need to turn their Monolithic Dome dream into a reality, we maintain a listing service on our website.

It includes Monolithic Dome builders, architects and designers, foam applicators and suppliers, engineers, lending companies, appraisers, and insurance companies.

PLEASE NOTE: Inclusion in our listing service is not equivalent to a recommendation. Monolithic strongly advises that clients check references and inspect completed projects before signing a contract.

Links and a Bulletin Board

Additional features of this website include links to other dome-related websites and a bulletin board system. The bulletin board allows anyone to post a question for everyone to see. It's a fast, convenient way to share information.

Everyone who uses the bulletin board system is required to register. This free and simple procedure helps ensure an honest, open discussion and reduces abuse. Once registered, you can post replies to posted questions, join in a discussion, or start a new topic.

An Online Catalog

It features and describes products used by Monolithic Dome builders and others working with plaster, grout and spray-in-place concrete masonry. Concrete pumps,

mixers, nozzles, respirators, promotional merchandise, books, videos and more are available and can be ordered online.

Workshops

Four times a year—twice in the spring and twice in the fall—we hold five-day Workshops, at our headquarters in Italy, Texas.

Led by our professionals, the Workshops cover every facet of Monolithic Dome construction. Each day includes both classroom instruction and hands-on experience. All Workshop participants work together in the actual construction of a new Monolithic Dome.

To register for an upcoming Workshop, call or email for current dates and registration information or visit our website for more details.

Training Pak

It consists of approximately seven hours of DVD, plus informational books and manuals. Generally, people with mechanical aptitude, construction know-how and the desire can build a Monolithic Dome after studying these materials.

The DVDs are hosted by David and Randy South (two of the three original patent holders for the Monolithic Dome). They contain the knowledge and experience of more than 30 years of building thin-shell concrete domes.

"Le Chateau de Lumiere" in Lehi, AZ — Architectural design of this home derives from a 17th century farm house. The driveway, in colored, textured concrete, creates a beautiful entry.

chapter eleven

The *Orion*—A Monolithic Dome with Vertical Walls

An astronomer will define Orion as, "a constellation on the equator east of Taurus." But at Monolithic, *Orion* is defined somewhat differently.

Orion is the name we've chosen for a series of Monolithic Dome homes we are building and teaching others to build.

It is a new dome design that features a Monolithic Dome built on a concrete wall.

The construction process for an Orion consists of three major parts: foundation, wall, and Monolithic Dome. Of these three, the construction of the wall is the newest development.

This new wall-building technique is based on one we developed to build spray-in-place concrete fences.

Monolithic Constructors, Inc. recently completed its first, two-story Orion with 2,200 square feet of living space. Its foundation has a diameter of 46 feet, and its

shape resembles a circle—one that has seventeen sides.

This Orion's eight-foot-high wall consists of 17 panels, each measuring 8' x 8', joined around the exterior of the foundation.

The Monolithic Dome atop the wall measures 48' x 12'—providing an overall height of 20 feet.

Here's how the construction process worked: With the foundation poured and cured, construction of the wall began by using 8' x 8' plywood form-panels. Each of the panels had a 12-inch wooden form attached along the length of its top edge.

When sprayed and cured, the wood was removed and the concrete ledge formed the eaves of the house. Window and door openings

"Orion" in Italy, TX — Its straight, outer walls do not compromise this Monolithic Dome's strength, disaster-resistance or energy-efficiency.

With 2400 sq ft, the Orion that includes this cozy master suite is spacious and comfortable. Its outer wall was built with seventeen 8' x 8' plywood panels, topped with a 12" ledge, attached to the foundation and sprayed with 2" of concrete. After an Airform, 48' x 12', was secured at the top of the wall and inflated, the building process proceeded as it would for any Monolithic Dome.

were measured, cut to size and nailed in place onto the form-panels.

Six plywood form-panels were braced against the adjoining sides of the foundation and, on their interior, sprayed with two inches of concrete.

Once that concrete cured, the crew removed the plywood panels. For this dome, this process was repeated three times. Spraying the plywood forms one section at a time allows the builder to save money on form costs.

After finishing the wall, the crew secured the Airform to the concrete eaves running along the top of the wall and inflated it.

The Airform and wall were then sprayed with three inches of foam and an additional 2½ inches of reinforced concrete, following standard Monolithic Dome construction procedures.

Although shown here as a kitchen built into a curved wall, these custom designed cabinets and Hyplon countertops would look great in an Orion.

Advantages of an Orion Design

- Easier to mount doors and windows
- A more conventional look
- More straight-wall area, preferred by many home owners for hanging pictures, placing built-ins
- Greater public acceptability in traditional, conventional areas
- Variety of exterior finishes: brick, stucco, paint
- Strength and durability approximating that of the Monolithic Dome
- Low, ongoing maintenance and energy consumption
- Versatility of size and shape: Wall can consist of virtually any reasonable number of panels. These can be arranged in a variety of shapes. The Airform can be relatively low for a single-floor Orion or tall enough to accommodate third floors.

Ankeny, IA — Mabel and Jack Boyt, the owners of this Orion designed a great room with a dining and a living area.

Disadvantages of an Orion Design

At this point, we see only two disadvantages to the Orion. We expect the cost of the Orion's shell to be approximately ten percent higher than costs for a conventional Monolithic Dome.

However, we anticipate some savings on the finish-out of the Orion, since its doors and windows will just *pop* in place, much like those in traditional houses.

The second disadvantage involves the Orion's wall construction. Since it takes place outdoors, inclement weather could result in construction delays.

Decorating the Orion — With straight walls, placement of large furniture pieces is easy.

Conclusion

The Orion Series Dome is a great variation of the Monolithic Dome. Some like it, some don't.

In any case, it provides more options for those wanting to build and enjoy the benefits of the Monolithic Dome and have vertical walls.

"The Inn Place," Brenham, TX — A successful complex of affordable rentals. Each dome includes a kitchen, bathroom with large linen closet, central ceramic-tiled living/sleeping area and a storage cabinet.

chapter twelve

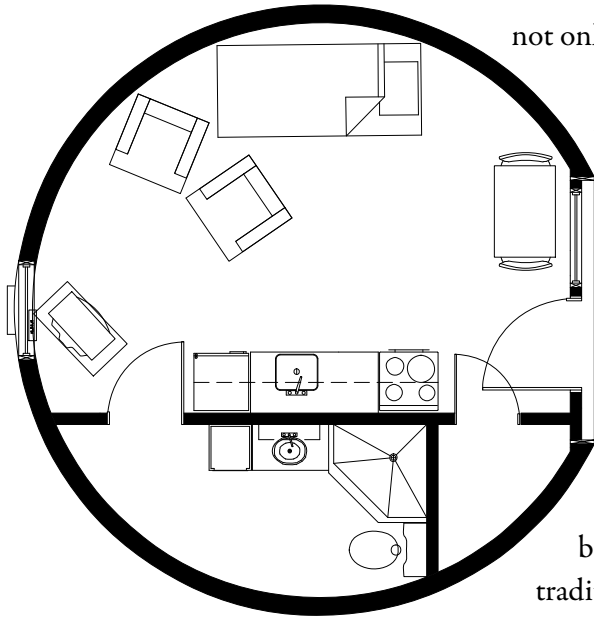
Dome Rentals: A Much Needed, Profitable Project

Efficient bathroom uses every inch of space.

For a long time now I've been thoroughly convinced that *If you build them, they will rent.* The *them* I'm talking about are affordable, safe, clean rental units, designed for one or two occupants.

In 2000 when I first began thinking about Monolithic doing rentals, I did some research. I found that traditional houses and traditional apartment complexes were not available to a huge portion of our population. At that time, two-thirds of America's renters were households of just one or two persons. Of those, 40% made less than $8 per hour. They lived on the edge and needed help that could not be provided by traditional housing.

That was before our current recession. Now the need is more dire. More Americans have had their salaries cut or have been forced to accept positions that pay minimum wages. Our middle-income class grows smaller while our low-income class grows larger. Unfortunately, that's the current picture that makes affordable rentals,



Io-20 Floor Plan — It's an efficient use of space: kitchen with stove, refrigerator, sink, cabinets; living/sleeping area with bed, table, chairs; bathroom with shower, toilet.

not only more necessary, but a better profit-making venture.

But what happens when we get over this recession? I believe that as an ongoing investment, clean, safe, affordable rentals are both recession-proof and boom-proof. In other words, even when our economy picks up, there will be a need for such rentals.

Traditional housing and rentals simply do not fill that need. They're mostly built for families rather than one or two persons, and they come with traditional power bills, fire hazards and maintenance problems.

Low-income workers, single working moms, university students and fixed-income senior citizens will always be a significant part of American society. But for them the traditionals are simply unaffordable or unsafe and unsanitary.

We wanted to design units that could be constructed affordably, maintained affordably and rented affordably and still be profitable.

We reviewed a United Nations' publication with guidelines for family housing in developing nations that called for a habitation of just 28 square meters (314 square feet) of living space.

Obviously that's a small space, but if properly designed it works well. Monolithic

decided that one or two people could get along well in 314 square feet—even 200 square feet if you wanted a more affordable unit.

Now we had to decide what construction guidelines to use, so we could get the necessary building permits and meet codes. Guidelines for traditional housing or apartments would not work for such small size units. But guidelines for ***residence inns*** would.

We now have 125 rental units and another 14 under construction. Usually, we have a long waiting list of potential renters.

Io-24 — Built with an integrated, 3' stemwall, this dome is 24' x 9'. It makes a practical, simply designed, affordable rental unit for one or two persons.

Several government programs, such as subsidized rent and Section 8 vouchers, make rentals affordable for some people, but Monolithic decided to forgo government participation.

We found that Petite Units can be affordably constructed,

and with Monolithic technology their maintenance and utilities can be kept to a minimum. The long and useful lifespan of Monolithic structures minimizes their depreciation, so amortization also helps keep them affordable. Then too, they are the safest buildings on the planet, and their small size and toughness minimizes tenant damage.

Project I: Studio Street

"Despite the low rents, Studio Street consistently shows a profit!"

In February 2001, Monolithic Holdings, Inc., a then newly formed subsidiary, opened its first rental facility: Studio Street. Its 17 units include furnished Monolithic Domes with diameters of 16, 20 and 25 feet that provide living space for not more than two adults and a child, and even smaller Monoquads designed for just one person.

Rental fees at Studio Street are truly affordable. They range from $80 per week for the smallest Monoquad to $135 per week for the largest dome. That fee is less a $5 to $10 discount for on-time payments and includes water, sewer, electricity, trash pick-up and yard maintenance.

Despite the low rents, Studio Street consistently shows a profit!

Anne Sutherland, our property manager, said, "We quickly had a waiting list for Studio Street. Vacancies are rare. Units don't remain unoccupied for any significant length of time."

A small but functional kitchen: sink, stove, refrigerator, cabinets.

Each rental unit includes a twin bed and table with two chairs.

Project II: Secret Garden-Italy

Experience with Studio Street spurred the establishment of Secret Garden-Italy, an equally successful, gated complex of four, 20-foot diameter units in the center of the small, rural town of Italy, Texas.

Project III: Secret Garden-Morgan Meadows

Our largest project, Secret Garden-Morgan Meadows, is a complex of 68 Monolithic Domes. Each is an Io-20 that provides 314 square feet of furnished living space. The overall design of the complex calls for groups of cottages in a garden-like setting.

Project IV: Rentals in Dawson

Plans for this complex in Dawson, Texas include more than 80 units. Eighteen have been completed and rented.

How the Rentals Work

Monolithic's rentals are classified as residence inns. For the first 30 days of occupancy, they operate under motel, hotel or inn rules rather than apartment rules.

This classification has some important advantages: Renters at a residence inn can pay their rent weekly. Unlike apartments, there is a smaller demand for deposit and security fees, making it far more affordable and easier for the renter.

Monolithic Holdings, Inc. asks for three weeks up front; that includes two weeks rent and one week deposit; that deposit is returnable when they move as long as there aren't any damages.

If renter occupies the unit for less than 30 days, hotel rules apply. Should a problem arise, a renter can be asked to leave. In Texas, after 30 days a normal apartment eviction applies. This rule varies from state to state.

Most units include a bathroom with shower, basin and toilet; a kitchen with stove, refrigerator, table and chairs; a furnished sleeping area; heating and air conditioning.

According to Anne Sutherland, renters at Studio Street and Secret Garden-Italy are asked to pay their rents on a weekly basis. She said, "If they pay on time or in advance,

The Inn Place

As a participant in a Monolithic Workshop, Kevin McGuckin, owner of "The Inn Place," studied the Monolithic construction process and our rental facilities What he saw and learned convinced him to build "The Inn Place."

which most do, they get a discount. The Friday before is the deadline and we have a drop box, so they can actually pay late Sunday night because I wait till Monday morning to pick up the payments. They can pay by check, cash or credit card."

Anne maintains a waiting list and simply calls the name at the top of the list when a vacancy becomes available. If that person is no longer interested, she calls the next one. She said, "It usually doesn't take very many calls."

Screening is limited to asking about the number and ages of people wanting to live in a specific unit. "We don't want overcrowding," Anne said. "We know that a 20-footer cannot accommodate four adults or even two adults and two children. It's just too much."

With the completion of Phase III, "The Inn Place" will include 48 rental units.

But Anne does not do financial screening or ask for references. She does, however, ask for a 48-hour notice if renters decide to leave. Screening does include a criminal background check.

With Studio Street, Anne said that they learned the need for very specific rules. Currently, Monolithic's ***Rules and***

"The Inn Place" maintains a Waiting List of prospective renters.

Rental Agreement contains 28 rules, that Anne reads, one-by-one, to each prospective renter.

"There's no two ways about it," she said. "They know what the rules are. Their signature acknowledges an understanding of those rules and they get a copy."

Monolithic has also designed its own ***Residence Inn Contract,*** a document that gathers vital data, such as the renter's drivers license number and emergency contact information.

"So far," Anne said, "our biggest problem has been smoke odor." Monolithic's rules allow smoking in units designated as *smoking cottages*. But the smoke does leave an odor that necessitates using a cleaning-deodorizing solution called Odor Killer to wipe down the cabinets and walls.

The Newest Rentable—The Monolithic Cabin

The Monolithic Cabin is a modified Monolithic Dome—like a tunnel with rounded ends. These domes all have a diameter (width) of 12 feet, but their total length and interior space depends on the model.

Model 15 is 15 feet long and has a living area of 155 square feet. Model 19 is 19 feet long, with 203 square feet. Model 24 is 24 feet long and 266 square feet. All models are a nominal 10 feet high, from bottom of crossbeams to top of roof.

The Monolithic Cabin is one of the most versatile, small domes we have ever designed. It's really an all-purpose unit!

We manufacture these cabins here, at our headquarters in Italy, Texas and load one or two of them on a truck for transport to the client's site. They weigh about 9 to 14 tons, are definitely shippable and require only a small amount of land.

Monolithic Cabins can be designed as single living units or combined with others. They make great rentals.

They can also be designed as granny flats, disaster shelters, workshops, offices or studios, game rooms, vacation domes, exercise rooms, temporary housing for work crews or home builders, guest house—the list goes on and on!

Financing options are available for the Model 15 through Monolithic.

Avalon, TX — This Monolithic Dome school gymnasium/ community center is 124' x 37'. It seats 720 and was completed $50,000 below budget and 2 months ahead of schedule.

Emmett, ID — Three floors of classrooms surround a 5-story atrium. A 25' diameter artificial skylight creates a daylight atmosphere during all weather conditions.

chapter thirteen

Versatility and Uses

In addition to homes, Monolithic Domes have been designed and built to serve a variety of other purposes. In fact, we could say that homes are just one category of Monolithic Domes. Others include schools, gymnasiums, churches, bulk storage facilities, as well as industrial, medical, recreational and business complexes.

Not only do we plan more of such construction, but we also anticipate the building of the Crenosphere—our newest offspring in the Monolithic Dome family.

The Crenosphere, both similar to yet significantly different from its siblings, makes an ideal arena or stadium for indoor sports and entertainment. Its diameter ranges from 300 to 1,000 feet, and its height spans 75 to 500 feet.

Crenospheres can accommodate thousands of spectators and a virtually limitless number of activities. Yet, Crenospheres are affordable and practical.

As Monolithic Domes grow in popularity, so do the reasons for building them. For example, many dream home builders and most churches, schools, and commer-

"Gladiator Coliseum," Italy, TX — Dome has 148' diameter, two stories, seating for 1500, gym with walking track, auditorium, classrooms, concession stands, ticket booths, locker rooms and bathrooms, concrete parking areas. Its 2002 construction cost:$85/sq ft.

cial enterprises want a Monolithic Dome for similar reasons. They want its long-term economic advantages, its strength and longevity, as well as its grace and beauty.

There are other reasons as well. The Monolithic Dome can be easily designed to accommodate the needs of the elderly or the physically challenged. For facilities that require security, such as prisons, the Monolithic Dome can be made extremely secure and efficient.

Many architects agree that Monolithic Domes with their open interiors make

1. Legacy Church, Albuquerque, NM — 192' diameter with 3,000 seats. **2.** CALAMCO Cold Storage, Stockton, CA — Product stacking along a circular aisle on the inside perimeter and a center aisle speeds loading and retrieving. **3.** Classroom, ISD 495, Grand Meadow, MN — This school received plan approval and a grant from its state legislature for twice the money it requested to build five domes.

ideal mega-churches, mega-concert halls, and mega-sports arenas for hockey, soccer, football, bowling—even golf and tennis.

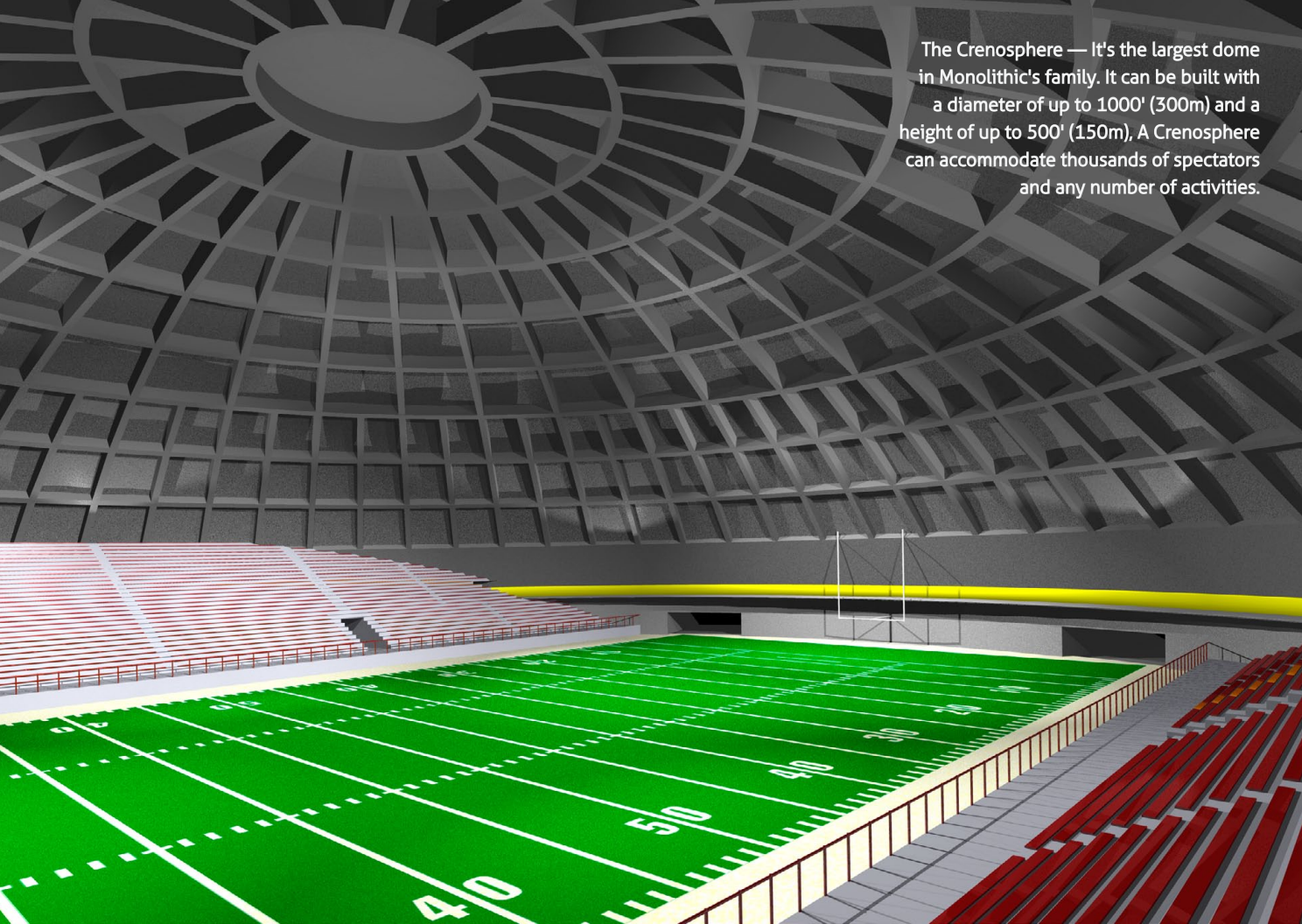
They can also be designed as a sky shell: a unique building that gives you a smooth, uninterrupted interior surface, in which you can create your own environment and reality.

Other examples of such uniqueness include the Monolithic Dome's ability to be built underwater or underground—and, in the future, in outer space.

While outer space is a possibility, I think the dome's real future—progress we may very well witness—will happen on this planet. Recently, I'm seeing portrayals of entire societies in domes: people in dome homes, schools, churches, offices, factories, shopping malls, recreational facilities.

That, I think, is not a fanciful but a realistic portrayal. It will happen as more and more people learn about the advantages of a Monolithic thin-shell, concrete dome. Once they learn, they will seek.

Bishop Nevins Academy, Sarasota, FL — Each of the four domes is a two-story roundabout with a stemwall. This was Florida's first Monolithic Dome school.



The Crenosphere — It's the largest dome in Monolithic's family. It can be built with a diameter of up to 1000' (300m) and a height of up to 500' (150m), A Crenosphere can accommodate thousands of spectators and any number of activities.

"Xanadu," Sedona, AZ — As you walk into this 5865 sq ft home, you feel as if you are in another world! Ten connecting domes each have their own size, shape and feel. High ceilings and skylights throughout foster a sense of space and well being.

chapter fourteen

Frequently Asked Questions

What are the different shapes of a Monolithic Dome?

There are three basic shapes for a Monolithic Dome: Sphere, Oblate Ellipsoid, Prolate Ellipsoid.

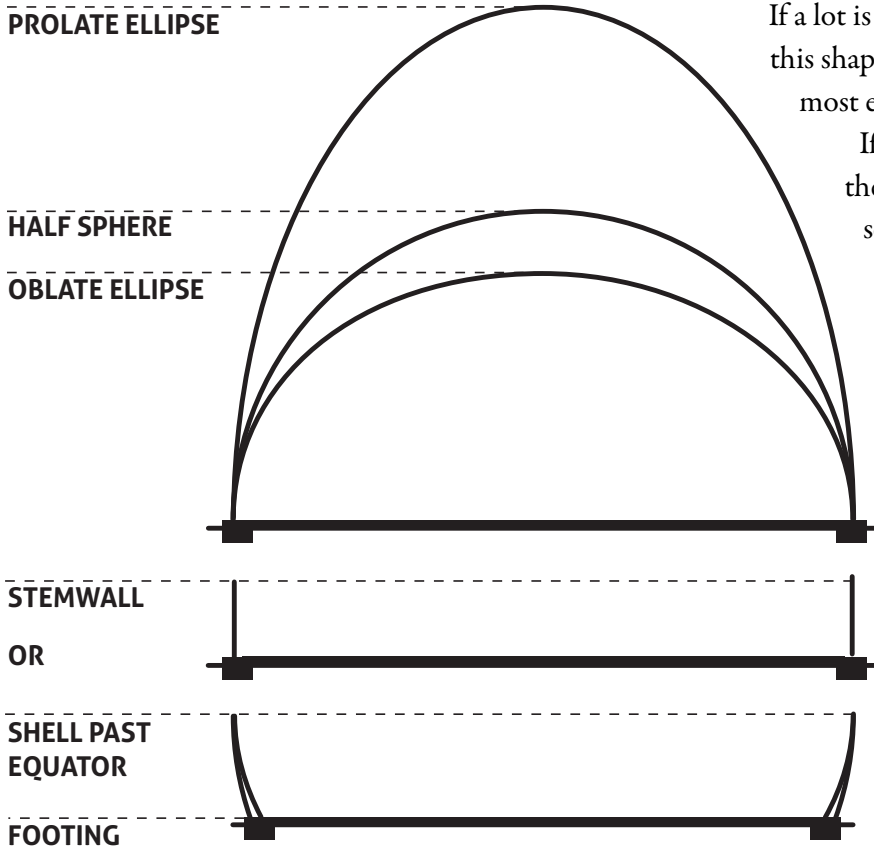
The sphere is simply a ball. It is truly round in all dimensions—like a basketball.

The oblate and prolate ellipsoids are round-like structures, but they are not the shape of a ball.

A sphere-shaped dome may be any part of a whole sphere. A hemisphere, or half sphere has straighter walls at the base and plenty of height.

Cut off the top fourth of a sphere and the dome is shallow and flat. Cut off the bottom fourth and the dome becomes nearly a ball that bulges from the bottom and can be quite tall.

A watermelon is a good example of a prolate ellipsoid. If we cut it in half, lengthwise, and place it on the ground, we call that a prolate ellipsoid in plan view.



If a lot is too narrow, we can sometimes use this shape. It is not often used as it is not the most efficient.

If we cut the watermelon in two at the equator, we can construct a tall semi-cone looking structure that may be great for effect.

The oblate ellipsoid looks more like half of a basketball that has been stepped on. It has some great features. It has straight-up walls at the base. It just curves flatter across the top. This saves on both height and surface area—hence money.

With the process of Air-forming, there are limits to how much we can ellipsize the domes.

What is a stemwall?

The stemwall is the vertical portion we form into some domes to make them taller. It is useful when creating multiple stories without increasing the base diameter.

Stemwalls are great for small lots and where a view is only obtainable from greater heights.

For a stemwall to be part of an Airform, it must be circular and topped with a half dome like a hemisphere or half an ellipsoid. It is exceptionally difficult to use stemwalls with multiple domes.

Why are there no elevation measurements for these plans?

Monolithic Domes can vary in height over an infinite range. We chose not to show the floor plans with elevation measurements as they will vary by need and application.

The height and cost of a dome are also affected by its shape.

How does a dome's shape affect its cost?

The floor area of a hemisphere is exactly half the surface area. The cost of a dome is in the surface area.

For example, consider an Oberon half sphere with a floor area of 804 square feet: it has a diameter of 32 feet, a height of 16 feet, and a surface area of 1608 square feet or twice that of the floor area.

"Curlew Keep," Republic, WA — The shape of this 2800 sq ft dome is a Torus but closely resembles the Hyperion.

But we usually build the Oberon as a half oblate ellipse, 32 foot diameter by 12 foot height. Its floor area remains the same, but its surface area is reduced to about 1380 square feet.

This surface area reduction of about 15 percent reduces the structure's cost by about the same amount.

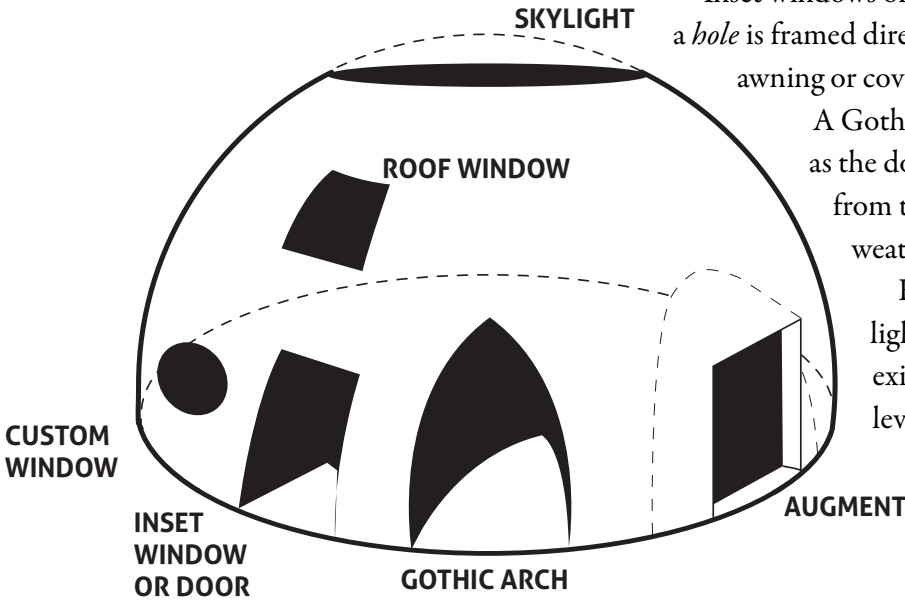
If we built the Oberon as a single-floor house, the extra height of the half sphere would hardly be noticed.

But if we want the Oberon to have a second floor, we need the height of the half sphere and a short stemwall. Or we could use the half oblate ellipsoid and a taller stemwall. We use the oblate ellipsoid often in the construction of houses as it is very efficient.

What kind of openings can be made in a Monolithic Dome?

Augments are special bulges added to the Airform to allow a window or door to stand vertically. They allow the window and door frames to be set on the dome's outside perimeter.

Less interior space is lost using augments, and they are stronger because they are part of the dome shell itself.



Inset windows or doors are easy to form because a *hole* is framed directly into the structure. Later an awning or covering can be built.

A Gothic arch can be built at the same time as the dome or later. It usually protrudes from the Monolithic Dome, providing weather protection at the doorway.

Roof windows are similar to skylights and can be used as a means to exit the building from another floor level.

Skylights can be nearly as large as the dome. The size of the opening does not seriously

hurt the strength of the Monolithic Dome. But large skylights cost big bucks, they can be hail damaged, and they let a lot of heat in and out. Nevertheless, they can be wonderful.

Consider skylights 18" in diameter to let in sunlight. (Note: Monolithic Domes do not leak until a hole is cut in them. So, don't put in too many skylights and make sure they are properly installed.)

Other openings of all kinds and shapes can be built into the dome. Your imagination and budget are your only limitations.

In 2006 in Shokan, NY, work began on this home with two intersecting sections: 40' x 23' and 30' x 18'.

Dome overlooking Lake Michigan has third-floor rooms with windows that provide a spectacular view.

Can I put a large opening in the dome?

Yes, in general and for monetary reasons, such openings should not be more than 20 feet wide.

A simple post allows larger openings. A large opening is great for a vista of windows or the addition of a sunroom. In any case, the width of the opening should not be larger than 40 percent of the Monolithic Dome's perimeter.

How are multiple domes connected?

Many plans utilize multiple domes. These are overlapping domes, that form an arch at the intersection. Care must be taken in the design to insure that the arch is big enough to pass through or to install doors.

The Airform is fabricated as one piece, so the completed dome is a single structure.

A *Simple Intersect* is a direct transformation from one dome to another.

A *Saddle Intersect* uses a transition "saddle" between the two domes. A Saddle Intersect is more expensive but has its own nice lines and is useful in connecting larger domes to smaller ones.

What is a President's Choice plan?

These are plans of popular dome-homes, that are complete and ready for immediate delivery.

How do I order plans?

With the exception of a President's Choice plan, all house designs are custom drawn at the Monolithic Dome Institute.

It takes four to eight weeks to complete a full set of drawings, including a customer's changes to preliminary plans we have in our catalog.

May we use these plans with our own architect or designer?

Yes. These plans are a starting point for your imagination. You are welcome to incorporate these designs and ideas in creating your own home.

Please feel free to make noncommercial, incidental copies as needed. We only ask that these designs are not copied for commercial use.

What is an *Engineering Stamp*?

In some localities an Engineering Stamp on the dome structural plan is required for a building permit.

The Monolithic Dome Institute has a list of qualified engineers. Stamped drawings incur an additional cost. Some jurisdictions also require structural engineering for second-floor framing—adding another cost. Our engineers can provide this as well.