

What Will it Cost to Build an Inflatable Dome in 2019?

**A step-by-step cost overview for
dome project managers**



**THE
FARLEY
GROUP**



Introduction

When you need to cover a lot of ground fast, an air dome is if the most cost-effective ways to do it. Air domes, also called bubbles or air-supported structures, are ideal for creating clear-span, climate-controlled spaces of up to 120,000 square feet – all at a fraction of the cost of any brick-and-mortar building.

Compared to permanent structures, inflatable domes are very affordable to build. It would be a grave mistake, however, to believe that they are cheap.

Many people involved with planning a dome project mistakenly assume that the cost to build a dome begins and ends at the price of creating, delivering and installing dome itself. In reality, air domes require extensive planning, permitting and site preparation, which accounts for expenses to the effect of tens or hundreds of thousands of dollars.

Unfortunately, there are many dome manufacturers in the market today who will gladly nurture and even encourage this costly misconception to their own benefit.



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What it *Really* Costs to Build a Dome

As of June 2019, it can be estimated that the cost to build a dome ranges from \$25 to \$30 per square foot. This cost range is based on the dozens of air-supported domes manufactured and installed by The Farley Group throughout 2018 and the first two quarters of 2019.

At first, \$25-30 per square foot may seem like a steep price – perhaps even unreasonable in light of the cost estimates provided by certain other dome manufacturers. Some manufacturers have gone as far to suggest that they can build a dome for half that cost.

Since its inception in 1970, The Farley Group had a hand in over 900 air-supported structures built around the world. During this time, our crew has had the opportunity to speak with thousands of people who own and manage domes, and have listened to hundreds of stories about different dome building projects.

It's through these conversations that we uncovered the reason for the stark cost discrepancy between dome manufacturers.

We discovered that for years, certain dome manufacturers have been purposely leaving glaring omissions in their cost estimates in order to entice customers.

At this day and age, customers can easily understand most industries' true costs by researching the subject online. Inflatable dome builders, however, have succeeded at keeping this information a trade secret. This has been possible because the industry is relatively small, with only a handful of competing manufacturers.

In 2019, manufacturers continue to make information about dome-building scarce, even as the cost to build a dome increases every year.





What Your Air Dome Budget Must Account For


Simply put, there is *much* more to building a dome than putting it together and filling it with air.

The Farley Group's estimate of \$25-30 per square foot includes all aspects of the dome construction process from beginning to end, including the costs of permitting and planning, all the site work requirements, labour costs, and the air dome package itself.

However many manufacturers provide cost estimates that only include the initial price of the air dome package. Their estimate does not account for even a fraction of the work required to prepare the site before the dome can be installed. In many cases, the cost provided does not even include creation of the dome's concrete foundation.

Sadly, many customers are led to assume that this incomplete estimate represents the cost of the project in its entirety. The manufacturer, eager to close the sale, does not inform them otherwise. This results in a nightmare of a build that runs hundreds of thousands of dollars over its anticipated budget.





It simply is not possible to estimate the cost to build a dome based only on the dome's design specifications. The size of the dome is one factor, but even the price of the dome package alone can vary depending on:

- Intended use (temporary, seasonal or all-season dome)
- Dome surface (soccer turf, tennis court, etc.)
- Custom colour or branding
- Interior lighting system
- Air conditioning and/or heating requirement
- Insulation requirement and type
- Number of entrances and emergency exits

Additionally, there are multitudes of factors above and beyond the basic dome package that have a significant impact on the overall project costs, including:

- Local bylaws and development fees
- Geographical location
- Building site characteristics
- Climate
- Air pollution

At just \$25-\$30 per square foot, a dome project can easily run into the millions of dollars once all expenses are accounted for. Neglecting to prepare for these expenses can result in a bill of costs that is nowhere near what you budgeted for.

An aerial photograph of a city, likely New York City, featuring a large steel truss bridge spanning a river. In the foreground, a large white dome structure is under construction, with a yellow crane visible. The background shows a dense urban skyline with various high-rise buildings. A faint grid pattern is overlaid on the top left corner of the image.

How This Whitepaper Can Help You Today

As a conscientious manager, you know that the success of any construction project depends on a realistic cost projection. Understanding the many steps and costs involved with the dome-building process now is key.

This whitepaper provides a step-by-step overview of what it really takes to bring a dome conception to completion. We hope this knowledge will empower you protect yourself from misleading cost estimates and begin laying the groundwork for your dome with confidence.



1. Project Planning

You want to build a dome. You know where you want to put it. But before you can break ground, you need to do some paperwork. Finalizing the details of your plans with City Hall comes with costs in the form of building permits and development fees – not to mention counsel to help you navigate them.

Building Permit

Dome construction cannot begin without a permit. Getting the necessary permit(s) requires some knowledge of the local bylaws that determine how you can develop the land, as any rules pertaining to structures likely apply to your dome and its foundation. Be sure to note any restrictions on the height of your structure.

Development Fees

Most municipalities collect fees from developers to go towards infrastructure costs. Your dome may not be a permanent structure, but it may incur development fees nonetheless. Typically, these fees are payable on approval of your site plan and draft plan.

Legal Counsel

It's in this early stage that you should consider retaining legal counsel for the project. Not only does this help you get through the permitting phase (especially when it involves a zoning amendment or other proceedings), but it is vital in dealing with the various construction contractors involved throughout the rest of the project.



2. Site Preparation Costs

The ideal dome building site is a blank slate: flat, empty and perfectly level. However, most sites require some work before you can begin building. The location must be cleared, graded and equipped with the utility infrastructure required to service the dome and its visitors.

Clearing and Demolition

Any pre-existing structures in the way of the dome need to come down. Depending on local law, you may have to obtain additional permits and cover further development fees to accomplish this. The demolition itself also carries costs.

Trees, rocks and other natural elements must be removed from the land in order to grade it. Be aware that this could involve environmental regulations. Your costs increase considerably if the site is home to protected vegetation, is vulnerable to erosion, or raises other environmental concerns.

Be certain to inquire with your contractor whether the quote for clearing and demolition includes the cost of disposal. The debris must be removed before you can begin grading the site.

Utilities

Although the air dome package includes a back-up power generator, this equipment is only meant to engage when there is a blackout. The dome cannot run on a generator alone. If the site is not already connected to utilities, you have to coordinate with local water, waste and electrical authorities to have this infrastructure built prior to constructing the dome itself.

Grading

You cannot build your dome on a steep slope! The site must be graded to create a strong, level base for the dome's concrete grade beam. The grading must also ensure the proper flow of runoff water to prevent erosion and foundation damage.



3. Hiring Professionals

Even though domes go up faster and cost less than most structures, they still require careful planning, proper permitting and precise work. A project of this scope is not something you can get off the ground all by yourself. Part of your responsibility as the manager of a dome project is to recruit experienced professionals who can help you get the job done as efficiently as possible.

Who You'll Need to Hire

Your team of professionals includes planners, designers, engineers, environmental personnel, legal professionals, and financial consultants. A construction manager or general contractor is required to help coordinate these services and oversee the project. The cost of these various services must be included in your budget from the very beginning.

For most professionals, previous experience in dome construction is an asset but not a prerequisite. However, there is no substitute for an experienced contractor or construction manager who has performed well on other projects like yours.

Finding a General Contractor/Construction Manager

Contractors play a key role throughout the construction process. They lend their experience working under local bylaws and building codes to help you plan the project and obtain the necessary building permits. Contractors coordinate other local professionals you need for your project, including architects and engineers. Towards the end of construction, these professionals also work with your local building authority for the required inspections and final approvals.

When recruiting for this pivotal position, it's important to investigate the candidate's background. Consider:

- What similar projects have they worked on?
- Did they complete the work on time?
- Would the client recommend their work?
- Were there cost overruns or work interruptions on these jobs?

4. Building the Foundation

Once you've prepared your site and obtained the necessary permits, you can finally start building! But you cannot simply anchor the dome fabric to the ground. Air domes require a strong, permanent foundation called a grade beam.

What is a Grade Beam?

Unlike a typical foundation, which supports the weight of the structure above it, the grade beam is designed to resist the uplift load created through the dome's pressurized interior. The perimeter of the foundation must extend down into the ground to firmly root the dome in place. Essentially, it acts as a counterweight to keep the dome anchored to the ground.

Designing the Beam

The beam's blueprint must be designed, reviewed and stamped by a qualified structural engineer. Although all grade beams use the same basic shape, each is built to accommodate the pressure generated by each specific dome.

Building the Beam

Construction of the grade beam is not much different from that of an ordinary foundation. Typically, the beam is poured by a concrete finisher or mason, and the process is overseen by a construction manager. An aluminum profile is cast into the top of the beam as a channel to attach the fabric membrane.





5. Installing the Dome Package

The 'dome package' refers to all components of the air dome itself. It is essential to find out exactly what is included in the dome package before selecting a manufacturer.

The Farley Group's air dome package includes everything you need to get the structure up and running on the concrete grade beam, including:

- Building envelope
- Inflation equipment
- Heating and cooling equipment
- Insulation
- Revolving door and pedestrian airlock
- Vehicle airlock
- Emergency exit doors
- Interior lighting system

The cost of a Farley Group dome package also includes installation.

Building Envelope

The envelope refers to the dome's fabric 'walls'. It consists mainly of vinyl-coated polyester fabric. The thick outer layer is specially treated to resist cold temperatures, UV radiation, mildew and chemical air pollutants. The inner-facing membrane is lighter, but still over-engineered to create an airtight, sturdy structure.

For the weather-facing outer membrane, the topcoat typically consists of basic OVDF polyvinylidene fluoride coating. The Farley Group also offers an upgraded formula containing DuPont Tedlar film to improve the dome's weather-resistance.



Inflation Equipment

The air pressure inside a dome only needs to be slightly greater than that of the surrounding pressure (<0.0036 PSI). Once inflated, it can stay up indefinitely so long as its internal pressure remains constant. This is accomplished with a powerful air exchanger. If the inflation system ever senses a drop in pressure, it automatically compensates by blowing more air into the dome.

The system includes an emergency generator to keep the dome aloft during a power outage.

Heating and Cooling Equipment

Depending on its intended use, the dome's climate control system includes a heating and/or cooling system. Because they are incredibly airtight, air-supported domes are impressively energy efficient and retain cool and warm air well. Domes are also well-insulated, with a layer of air and insulation between the fabric membranes.

Insulation

The insulating system is sandwiched between the inner and outer fabric membranes. A dome may either use traditional fiberglass insulation or advanced reflective insulation consisting of bubble pack and heat-reflective foil. Most of The Farley Group's air domes use reflective insulation, as it effective insulation and boasts moisture protection, mold resistance, and a Class 1/ Class A fire rating.

Not all domes require the same amount of insulation, as dome engineers are mindful of the climate when custom designing the structure to ensure its thermal needs are met.



Pedestrian Airlock

Air-supported structures make use of a revolving door and pedestrian airlock to allow people to enter and exit the dome without air escaping. Every dome has at least one regular pedestrian entrance in addition to emergency exits. Be aware that larger domes (and those that are subdivided) may require additional revolving doors.

Vehicle Airlock

For vehicles and other things that can't fit through a revolving door, an air dome can include one or more larger entrances with an extended airlock. A vehicle airlock includes a vehicle-sized chamber with a large door on either side, one facing outside and another connecting to the dome.

Emergency Exits

Depending on the local building code, an air dome may require a minimum number of emergency exits. These doors are specially engineered to open smoothly under intense air pressure. You must ensure that these doors come with the appropriate signage and lighting.

Interior Lighting System

Most air domes today are built with LED lights to minimize the resulting energy costs.

Owing to the shape and white interior walls, air-supported structures do not require nearly as much lighting would be required in a similar brick-and-mortar facility. Still, it is crucial to ensure that your dome has enough light to properly illuminate the play area.



6. Additional Costs

At The Farley Group, the dome package has everything you need to get the dome up and running on its foundation, from the fabric membrane to its various mechanical systems. However, it's important to understand what the package doesn't encompass, including the surface inside the dome.

Surface Installation

Installing the turf, clay or other surfaces in the dome is a big job that requires the work of surface professionals. Athletes require a precisely-engineered surface to achieve peak performance. This element must be finalized before the dome is finished planning, since it affects the dimensions of the dome.

Connected Buildings

Many air domes are built with connections to smaller buildings made from traditional materials, like a reception area, washrooms or change rooms. Although these buildings can be incorporated into the dome's initial design, the package does not cover the cost of building them.

Parking Lot

Parking areas are often subject to local bylaws. You may have to seek approval for the lot separate from the dome itself. The cost of this approval should be considered along with other parking-related costs such as paving, painting, and exterior lighting installation.



How to Start Your Project with Confidence

This whitepaper serves as a step-by-step overview of what it truly costs to build an inflatable dome from start to finish in 2019. The appropriate budget for a dome project is in the area of \$25 to \$30 per square foot. However, every dome is a custom job, and the exact cost depends on the size of the space, the building site terrain, the climate, the purpose of the structure and numerous other factors outside of your control.

Before committing to a dome project, we encourage you to reach out to The Farley Group for more information on the considerations for a dome that meets your specific needs. You are welcome to call us toll-free at 1-888-445-3223 or contact us at info@thefarleygroup.com.

We also welcome your questions about any cost estimates you have already received to build an air-supported dome. Our team has serviced and repaired domes built by every major manufacturer and we're happy to lend our expertise.

Don't wait until the project is underway to clarify your potential costs. Far too many dome owners and managers have encountered significant delays and cost overruns due to inaccurate cost estimates. Your vigilance today will pay off in the future.

About The Farley Group

Since its inception in 1970, The Farley Group have been industry leaders with a hand in over 900 air-supported structures around the world.

We published this whitepaper to help anyone researching air-supported domes understand the true cost requirement to bring a dome project to completion.

In our experience, these costs are not well-understood by many of those involved with building a dome, which has allowed certain dome manufacturers to exploit unknowing clients to their advantage.

We hope this whitepaper will empower clients to avoid being misled. To find out more about what it will cost to build a dome in your area, feel free to call us at **1-888-445-3223** or contact us at **info@thefarleygroup.com**.



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