

## Introduction

Using metal as a building material is nothing new – iron beams first made modern skyscrapers possible. Buildings made entirely of metal have been cropping up across the country for 60 years since the Quonset hut was invented during World War II. However, until the end of the 20<sup>th</sup> century, most of these steel buildings were garages, airplane hangars, barns, and warehouses.

Today, modern building materials, insulation, and finishing options make steel buildings a better choice for many types of buildings such as churches, retail stores, manufacturing plants, sports arenas, and offices. Their primary advantages over traditional construction - that they are cheaper and faster to build - stem from the fact that much of the work is done at a factory that fabricates the component parts of the building.

Whether your business needs a 10' x 20' shed or a 150' x 300' manufacturing facility, a steel building might be the best choice. However as with any construction project, there are some complicated decisions to make and potential pitfalls to avoid. This **BuyerZone Steel Buildings Buyer's Guide** will explain the process and help you get the best steel building for your business.

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## Pricing guidelines

Actual costs for a steel building will vary enormously depending on the features you choose, the overall size of your building, and the design choices you make. Here are some very rough estimates – we'll go into more detail on page 7.

Type of Building	Estimated cost
Basic, rigid-frame building with little finishing	\$16 to \$20/sq ft
Standard building with more finishing	\$20 to \$30/sq ft
Custom buildings, complicated projects	\$40/sf and up

## Steel building process and benefits

The benefits of a steel building come from the construction material itself (steel) and how the structure is built. The combination of metal construction and pre-fabricated components provides three main advantages:

- **Cost.** Because the labor to put up your building is drastically reduced, you can save 30% or more over more traditional construction methods.
- **Speed.** A finished steel building can be operating in 60 to 90 days, instead of 6 months or more.
- **Durability.** Without requiring repainting or other maintenance, steel buildings are guaranteed to last 20 to 30 years, depending on the manufacturer.

Here is an outline of how a typical steel building project progresses:

1. **Design.** Before any work can proceed, you need to specify the size and shape of the building, the type of roof and interior walls you want, the number and placement of doors and windows, and any façade or other cosmetic enhancement.
2. **Engineering.** Once the basic design is complete and you've paid a deposit, an engineer needs to create the specifications and blueprints for the building. The blueprints will specify what materials should be used and what loads the building will need to be able to withstand to meet local building codes.
3. **Fabrication and delivery.** After the blueprints are signed off on, the real production begins. The beams, posts, girders, side and roof panels, and even the fasteners to hold the building together are all produced at a factory, then shipped to your construction site. The parts are pre-cut to the exact dimensions you need, pre-drilled, and ready to be bolted together. This step can take 3 to 6 weeks.
4. **Sitework.** While the components are being manufactured, the building site can be readied. Steel buildings require foundations, which are usually poured concrete.
5. **Construction.** Once the components arrive and the foundation is ready, the actual construction can take place.
6. **Finishing.** Adding insulation, interior walls, exterior finishes, doors and windows, steps, plumbing, and all the pieces that turn a metal box into a building you can appreciate.
7. **Walkthrough.** Like any construction project, your steel building needs to be approved by a building inspector once it is completed.

## Designing your steel building

There are two major sets of factors that will influence the design and construction of your steel building. One is practical: the actual use of the building. This requires work on your part to think through exactly how you'll use the building. For example, if you're building a warehouse, you may need roll-up doors high enough for your forklifts to drive through. Steel buildings always require foundations, which in most cases are flat concrete slabs.

The second is legal. Every state has different building codes that will apply to your project. These will include things like snow load and wind load: how much of either your building must be able to stand up to. If you're building a church or emergency vehicle garage, extra "importance factors" may apply that require push the code requirements even higher. Other legal requirements include local zoning laws, drainage requirements, and more.

Some aspects of your design involve both practical and legal considerations: for a retail facility, appropriate parking and handicapped access fall under both categories.

While steel building suppliers can often help you research these codes - most won't ship you a building that doesn't meet codes in your area - the ultimate responsibility for meeting them is yours. The bottom line on planning your building is that if you're not familiar with major construction projects, you'll need to rely on experts to assist your planning.

## Design choices

Steel buildings come in two main designs: arch style and rigid frame.

**Arch style** steel buildings (aka Quonset huts) became popular during World War II. They are built from a series of interlocking metal ribs that form the roof and sides of the building. Arch buildings are mostly used for storage buildings, garages, and sheds.

Small arch style buildings are popular among do-it-yourselfers as their construction methods are simple and they are less expensive per square foot.

They are not very adaptable or customizable, however. Their construction only



allows for doors and windows in the endwalls, not the sides, and the overhead clearance drops considerably as you get further away from the center of the building.

construct a rigid frame building than an arch style building.

The primary type of steel building used in commercial and industrial applications is the **rigid frame** style building. These are constructed with steel skeleton framing and flat steel panels for the roof and walls. They can include doors and windows in any wall, and can be expanded with relative ease. While they are still much easier to build than traditional buildings, more expertise and equipment is required to



An additional type of building often produced by the same manufacturers is the **pole barn**. Pole barns are simple buildings that use steel framing, but feature wood floors and/or walls. They are primarily used for agriculture. Note: most of the topics addressed in this Buyer's Guide apply more to arch style and rigid frame buildings.

## How big do you need it?

One of the advantages of steel buildings is the huge open spaces they can easily contain. However, try not to get carried away: the bigger the building, the more it will cost you. The first consideration about size, of course, is usage. Whether the building is going to contain shelving units, parking spaces, pews, or offices, you should carefully plot out a desired floor plan to determine the height and width you need.

A large majority of steel buildings are single story, but they can be built with two or three floors if your application calls for it.

You also need to decide if you can live with interior columns or not. "Clearspan" buildings - those without any interior columns - can be up to around 150' wide. However the wider they get, the more weight the frame has to support and the more expensive the building becomes.

In "modular" commercial steel buildings, width is nearly unlimited - over 1000' is possible - but you'll have a series of metal columns inside. (**Note:** the term "modular buildings" also refers to an entirely different type of construction in which smaller, more finished buildings are completely produced in a factory then shipped to their destination.)

## Sizing your building

### Height

There are two aspects to your metal building's height: overall height, measured on the outside, and interior clearance. The overall height may be regulated by zoning laws, but the clearance height will usually have more of an impact on your design decisions.

At the low end, 10' clearance is plenty for many applications. Heights of up to 30' can accommodate extensive warehouse shelving systems, heavy construction vehicles and tractor-trailers, or even airplanes – but of course you'll pay more for additional clearance.

### Roof

Rigid frame metal buildings can come with several types of roofs. "Single slope" construction starts with one side wall higher than the other, and the roof simply slants from the high wall to the lower. "Peaked" or "gable" roofs have a more traditional peak, with the roof running down to both sides.



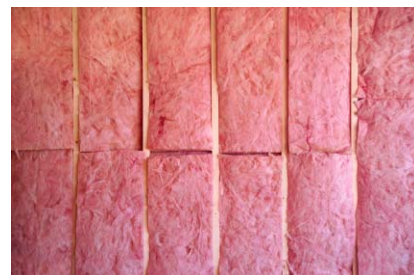
You may be able to choose the pitch of your roof, as well. Pitch is usually expressed as a ratio: 1:12 is the flattest type of roof, rising 1" for every 12" of width. 4:12 is usually the steepest pitch available for steel buildings. Increased pitch gives you more interior clearance, helps improve the building's ability to shed rain and snow, and can result in a better looking building – but also increases costs.

Arch style buildings have no distinction between roof and walls - their curved sides act as both at the same time. Some arch style steel buildings come to more of a point at the top, while others are uniformly curved, but generally they have fewer options than rigid frame buildings.

### Extras

Unless your metal building is going to be an unoccupied storage building, you will need insulation. The same rating system used in residential construction is used for commercial steel buildings: R-7 is equivalent to 2" of insulation, and R-19 is 6".

An important note about insulation: if you're going to be heating and cooling the building year round, you'll save money by buying R-19 insulation. Even though it is more expensive initially, the savings in your energy bill will easily make up for the cost in just a year or two. You may also want a vapor barrier for the roof and walls, which can prevent condensation.



Other important extras include "walk doors" for pedestrians, various types of vehicle doors, windows and skylights to let natural light in, and gutters and downspouts to manage runoff. Be sure to inquire about the insulation value of the doors and windows: look for double-pane glass and insulated doors.

The final set of add-ons for your building are cosmetic. At a minimum, you'll be able to choose the exterior color of

your building. If appearance is important, you can choose more expensive finishing options such as complete façades of wood, brick, or stucco. These options are less common, but very important to some buyers. Interior walls or partitions to make offices are built by your construction contractors, not the metal building manufacturer.

### How to buy steel buildings

There are three major ways to purchase steel buildings:

- **General contractors (GCs)** are the people who will actually put up your building. Typically a GC will get a general idea of the type of building you need, talk to a broker or several manufacturers, then present the options to you. In some cases, a GC may have a preferred manufacturer that they will always turn to.
- **Brokers** work with multiple factories. Like GCs, they will consult with you to determine your needs, then provide a proposal based on the manufacturer who can best meet your needs. However, their involvement ends once the pieces are shipped. You'll need to set up the building yourself or hire a GC.
- The **manufacturers** who actually create the component pieces do sell directly to customers in many cases. They will create and ship the building based on existing specifications you choose from, or can work with you to design a more customized building. Once again, you must handle the building construction.

Because of their experience, GCs are a better way to go if you're not familiar with planning and managing construction projects, especially if you have a GC who you work with on a regular basis and who understands your business.

Brokers have more expertise with steel buildings and can have leverage with multiple manufacturers - their relationships can help you save money. They can often help you find the best deal, and can put you in touch with qualified contractors in your area if you do not have one.

If you have more experience with building projects and know exactly what you want, you may be able to save money by going directly to a manufacturer. Cutting out the middleman also eliminates potential finger-pointing at later stages if anything goes wrong. Going direct can also be a good idea if your project is very small-scale - smaller arch-style buildings that you'll erect yourself, for example.

### Comparing suppliers

The selection of a steel building supplier is important: there are unfortunately some less-than-reputable players in the market who will try aggressive sales techniques, insert deceptive language into contracts, and knowingly quote you a price on a building that doesn't meet the building codes for your area.

#### Watch for sales tricks

High-pressure sales pitches are a problem for this industry. In the course of talking to brokers and manufacturers, you may hear tired old sales clichés like "This is the last one on the lot" or "MegaCorp just cancelled a huge order, I can sell you their components cheap if you sign today", and other pitches designed to get you to ACT NOW!

Most of the time, these "opportunities" are simply untrue - a major steel building manufacturer recently got into legal trouble for misleading sales practices like these. Do not fall for them: real good deals will be there tomorrow, too.



## Building to code

Reputable manufacturers and brokers do not want to sell you substandard buildings, so they often maintain databases of current building codes nationwide. However they won't usually depend on that information.

The best way to proceed is to have the manufacturer or broker list the codes your building has been specified to meet in your contract, then verify those figures with your local officials *before* you sign the contract. A supplier who wants you to sign a contract before you verify the specs independently isn't someone you should do business with.

## Questions to ask

- How long have you been in business?
- Do you provide engineer-certified blueprints?
- What kind of guarantees do you offer?
- How long will it take you to create and deliver my building? (This one is useful if someone pushes a "closeout special" on you – if it is already on their lot, they should be able to deliver it in a couple of days.)
- How do you ensure that my building meets the building codes in my area?
- Do you have a specialty? (Some companies focus on larger buildings, over 50,000 square feet; others may focus on hangars and garages as opposed to retail and other commercial buildings.)

It's worth checking with the Better Business Bureau in the supplier's area to find out if any complaints have been lodged against them. You should also read the contract they provide very carefully – more on that in **Steel Building Pricing**.

You should also ask the dealer for customer references, preferably of customers using their buildings in the same way you intend. Even better, if the dealer can provide local references, you'll be able to see the buildings for yourself. When checking references, you can ask questions like these:

- How long have you been a customer of theirs? How many steel buildings have you purchased?
- Would you buy from this dealer again?
- Are their deliveries complete and on time?
- Did you get the right building for your application?
- What could the dealer improve about their operation?

## Pricing steel buildings

Estimating prices for steel buildings can be complicated, because there are a large amount of variables that go into each project. Local building codes have a big impact on price: a building in Denver has to be capable of handling a huge snow load, so it requires significantly stronger components than a building in New Mexico. And extras like insulation and interior panels can make a big difference.

That said, a typical price for basic rigid-frame metal buildings is between **\$16 and \$20 per square foot**. This includes materials, delivery, the foundation, and construction. A more finished building may be closer to **\$20 to \$30 per square foot**, and extensively customized buildings with brick facades, unusual shapes, or complicated construction can reach **\$40 per square foot or more**.

Materials alone can cost \$5 to \$15 per square foot. This varies according to size: small buildings cost more per square foot. Materials for a 250' x 120' church building might cost \$240,000, or \$8/sq ft, while a 20' x 20' garage might cost \$6,000, or \$15/sq ft.

Foundation costs are fairly standard, usually \$4 to \$8 per square foot for poured concrete. Remember that GCs may include this cost in their proposals, but brokers and manufacturers of metal buildings definitely will not.

Labor costs will vary widely depending on the size of the project but can range from \$3 to \$10/sq ft. These costs will be charged by the hour, so increased complexity will drive them up considerably.

Insulation will add thousands of dollars to the cost of a larger building – but as mentioned previously, is a very good investment. It will improve the resale value and soundproofing of your building, in addition to saving energy costs – so it isn't an area to skimp on.

### Contract tips

You'll be asked to sign a contract that details the design loads and specifications for the building. As with any major business purchase, you should inspect the contract very carefully before signing it. Here are a few things to look for:

- **Substitution clauses.** Manufacturers may try to give themselves the right to use different materials if those specified are not available. The idea is sound, but is often used to substitute cheaper materials for those you wanted. Make sure any changes are “equal or greater value” or have to be approved by you.
- **Specifics.** The more specifics in the contract, the better. The contract should not just list a “10 x 10 overhead door” – prices range from \$250 to \$1200 on such doors. The contract should list brand names and model numbers, insulation values, locks, coatings or paints, and more. This is another way unscrupulous dealers may try to stick you with lower-quality materials, so make sure every component is detailed in the contract.
- **Responsibilities.** Since brokers, GCs, and manufacturers play different roles in the process, make the contract details exactly who is responsible for each phase of the project: design, engineer's specification, fabrication, delivery, construction, and inspection.

### Buying tips

- **Do not pinch pennies.** If you're spending tens of thousands of dollars, a difference of \$500 here or there is not significant. The building is going to last 30 years or more, so make sure you get the building you want.
- **Look closely at good deals.** When two dealers present bids for similar steel buildings that are thousands of dollars apart, you should investigate the details thoroughly. Chances are that one is not including everything you need.
- **Verify the building codes.** We can not stress this enough: **make sure** you get in touch with your local building officials once you have specifications from your supplier, but *before* you sign the contract. Changes to meet code will always drive your costs up, so to avoid late surcharges, you need to verify that the contract includes all the right specifications.
- **Get it in writing.** Some manufacturers may ask for a verbal go-ahead to “get the factory working” or to “lock in this price.” This is never a good idea. Getting the details in writing will ensure that you know exactly what you're buying.