

Steel Building Purchasing Guide



Introduction to the Steel Building Buying Process

What's inside:

- ❖ Trends
 - ❖ Types
 - ❖ Specs
 - ❖ Building Components
 - ❖ Questions to Ask a Dealer
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Purchasing a steel building is an investment for contractors, brokers, builders or individuals. Compared to other types of structures, steel buildings are versatile and economical. However, steel buildings can be a difficult purchase because of the many styles and variations.

While steel buildings were, until recently, mostly used in commercial and industrial areas, today, steel buildings offer economical and versatile solutions to storage and even work requirements. There are unlimited choices to create innovative designs to meet your aesthetic and practical requirements.

The following factors will play an important role in your selection process:

Cost

Steel components may not be low in price. However, building houses or buildings with steel significantly decreases overall construction costs. As steel is prefabricated, there is no wastage onsite. Erecting steel buildings requires fewer laborers. This results in decreased labor costs. There are no hidden costs and constructional delays. Both the construction process and maintenance are easy with steel.



Speed of construction

Another advantage of steel buildings is the speed at which you can complete the construction. Unlike traditional construction materials which require months to build, steel components are pre-engineered and pre-fabricated with pre-punched holes and anchor-bolts in place. Fixing

and erecting a steel building is quick and easy for an experienced contractor. Assembly drawings and step-by-step erection guides enable you to understand the process and complete it easily.

Durability

When compared with other building construction materials, steel has a larger heaviness ratio (to be explained more in Specs). Still, it weighs less than timber, making it easier to carry. Steel can withstand hurricanes, earthquakes, and strong winds, owing to its high ductility. Steel doesn't rotate, buckle, distort or divide. Thus, it is extremely durable and provides more value for your money.

Purchasing process

You will either purchase a steel building from a general contractor, broker, or directly from the building manufacturer.

✓ **General contractors**

Contacting a general contractor is the most streamlined and preferred way of purchasing steel buildings. Right from purchasing steel components to delivering and assembling them, a general contractor handles all operations involved in the construction of a steel building.

Generally, these contractors are associated with a broker or a steel manufacturer who provides quality steel products or pre-fabricated buildings. The entire cost would be billed to you by the general contractor.

✓ **Steel building brokers**

Steel building brokers act as intermediate persons between consumers, steel manufacturing companies, and general contractors. Based on the customer's choice and preferences, a broker collects best proposals from manufacturers and handles purchasing and delivery operations. In addition, the broker arranges a general contractor to handle foundation, assembly, and insulation works.

✓ **Manufacturers of steel buildings**

Several steel companies sell directly to customers. Purchasing steel components directly from the manufacturer eliminates intermediate costs. Moreover, you can request customized alterations and work with the designer to create innovative products.

When you purchase components directly from the manufacturer, you need to handle assembly and foundation tasks on your own. The company only ships prefabricated steel components to your location.

Construction timeline

Starting your building project in the winter or back ordering the material may delay your construction schedule. Otherwise, the building process of a steel building is seamless. The builder will provide a map in the form of excel sheets whereby you can monitor the project schedule. You know how long each procedure would take to get completed. Today,

construction monitoring software guides you in the project and lets you know about potential delays in the construction.

Trends

Steel buildings have gained in popularity among residential communities as well as industrial sectors as they are quick to install, easy to maintain, durable and cost-effective. As a purchaser and future user, you need to consider local climatic conditions, environmental impact, governing authority regulations, and overall costs that will influence your decision in choosing the most appropriate building.

Three important trends are worth considering:

Building Green

Today, residential and commercial buildings in the US alone account for 80 million plus and consume one-third of the energy. Industrial buildings pollute the environment with sulfur dioxide and nitrous emissions. In an effort to reduce this pollution, the world is now moving towards sustainable technology. The steel industry is not excluded.

The last decade has seen a great move towards erecting green buildings that are energy efficient, weatherproof, and reduce waste. Using solar roof panels, a double layer insulation system, insulated wall panels, and painted cool roofs, you can reduce heat emission and create a greener environment while saving trees. Most of the steel used in the construction industry can be recycled as well.



Weatherproofing

While purchasing steel components, consider your local climate. Though steel buildings withstand high winds and storms, the strength depends on the quality of the foundation and roofing. Ideally, with solid installation, steel buildings withstand high winds of 160-170 mph easily. If you live in areas that experience high snowfall, your roofing product should be of appropriate quality for the weight of the snow. To avoid vertical stress on the building from accumulated snow, pitch the roof high enough to reduce snowfall accumulation.

Another important area is waterproofing. If your area experiences high humidity, heat, and rainfall, your steel component needs a factory-standard protective coating that can augment the waterproofing ability of steel. Steel usually comes with a *Galvalume* coating. However, an

additional coating would be a good option. Discuss this issue with your manufacturer and explore different sealant options.

Insulation is another area of concern. Areas with high humidity and rainfall would need insulation with moisture resistance and vapor lock properties. If your area receives high winds, doors and windows need to be stronger.

Energy efficiency

Another important trend that can affect your final decision is building energy-efficient buildings. Within the last three decades, steel buildings have become the most energy-efficient ones in the construction segment.

In addition, steel buildings adhere to energy codes mentioned in [The American Recovery and Reinvestment Act](#) (IRRA). Buildings constructed with Cold-Formed Steel (CFS) are more energy-efficient. They adhere to the IRRA Act as well as to green building standards.

Normally, any construction material that is placed in any part of a building facilitates a pathway to heat transmission. Especially, in cold areas, this can be significant. This heat transmission is reduced by insulating with foam products. When CFS is used, thermal bridging through the steel is reduced or eliminated. Without adding excess amounts of foam, you can build energy efficient and cost-effective steel buildings.

While purchasing home appliances, you need to check for higher efficient heating appliances, cooling equipment, windows, and other aspects. It is important to work closely with the designer to get an energy efficient building without excessive insulation, framing, and costs.

Whatever design and model you choose for your steel building, it is important to consider these three aspects before finalizing your purchase.

Types

In your purchasing decision, you must explore the different types of buildings offered. There are three main types of steel buildings: Quonset Hut, Pole Barn, and Straight Walls. At the same time, the interior design is categorized into two types: Clear Span and Columns.

Quonset hut

A Quonset hut is a curve or arch shaped building that comes as a self-supporting structure. It doesn't contain any supporting beams or interior posts. It was first introduced in Rhode Island for the Quonset Point Military Base from which its name is derived. The architecture is such that the Quonset hut can withstand hurricanes, winds and earthquakes and is termed as the strongest structure in this segment. It is one of the most economical forms of steel buildings.

There are two types of Quonset hut structures:

- ✓ The first one is a semi-circular shaped structure.
- ✓ The other one has straight walls dug into the ground. The roof is semi-circular.

The Quonset hut is one of the cheapest and strongest structures. Installation, assembly, erecting and disassembling tasks are relatively easy. As the components come as nested spoons, containerization is simple. There is no need to use cranes or large equipment. Hence the Quonset hut is considered as the best choice in remote locations.

This model is best suited for open-end structures and for storing grains and other crops. However, insulation might become expensive. Installing side doors requires expertise as the curved design makes it somewhat difficult to incorporate them.

Pole barn

A pole barn is a building structure that typically has wooden poles buried into the ground and used as columns for the roof. While wooden pole barns are cheaper, they require more time and investment for maintenance, repairs, and for further expansion. Using steel for a pole barn structure has a greater advantage.

A steel pole barn structure uses a concrete foundation to which steel columns are anchored. Steel pole barns are durable, weather-resistant and mold-resistant. Steel frame barns are suitable for housing livestock and for storage purposes. They are cheaper and can be quickly built. However, they are susceptible to strong winds when compared with other types of steel buildings.

Straight wall

A straight wall or a rigid frame structure contains straight walls with a clear interior space. The roofing can be gable style, single slope, straight column, beam and column, or lean-to style. Straight wall structures economically offer clear space without any poles and columns.



Straight columns that have seventy feet of clear space are better suited for small retail stores, offices, and other commercial applications. Gable and single slope structures work well for airplane hangars and gymnasiums. Beam and column models suit warehouse and industrial purposes. Straight walls offer more innovation to architects to experiment with different styles. While the cost is 30% higher when compared with arch styles, straight wall designs are easy to build and offer more protection.

Clear span vs. columns

A clear span, in the architecture field, is a term used to describe the internal structure that does

not have any supporting pillars and provides wider space inside the structure. The structure contains straight walls but the roofing has different styles. You can use a single slope roof, one way slope roof, or a gable style roof that has a peak in the middle. As there is no internal support, usable space is greater.

This structure is mostly suited for warehouses and factories where forklift trucks and heavy machinery are operated. Aircraft hangars, gyms, and sports centers are other areas that can benefit from this structure. As there are no pillars inside, the exterior construction needs to be heavier when compared to column or beam structure. For this reason, the construction costs are higher. However, the usable open space outweighs this cost.

For structures that do not require large usable space, columns are a preferred choice. With columns supporting the structure, the overall construction costs are less when compared to with clear span structures. Assembling the components and erecting the structure is quick and easy. Column supported structures are suited for resident buildings, offices and retail stores. However, they are not suitable for aircraft hangars or gymnasiums; aircraft hangars need more interior space to host large aircraft. With structural obstructions, this is not possible.

Typical industry-wide preferences that you should be aware of:

Apart from price, people in different industries select types of steel buildings that reflect their needs and purposes.

- ✓ Agricultural (barns, equipment storage, equestrian stables) industry prefers pole barns.
- ✓ Residential (homes, garages, RV storage buildings, sheds, and workshops) sector prefers straight walls with columns.
- ✓ Retail (stores and shops) businesses prefer straight walls with columns.
- ✓ Commercial (distribution and warehousing) segment prefers arch type or straight walls with a clear span.

Specs

Before purchasing a steel building, you should spend some time analyzing your building requirements. This will help you more accurately choose the best building solutions. You need to weigh present and future requirements and carefully consider your budget and available options to make the most out of your purchase.

The following are the aspects you shouldn't ignore.

Size

The size of the building is the first thing to consider. The size of the steel building you require depends on the purpose of the building. Based on what you use the building for and the number of people using that building, you can determine the size you need.

For a business office, you need to consider the number of employees and processes to assess the size requirements. Provide these details to the dealer so that he can determine exact dimensions for the building.

Purchasing Tip:

A good rule of thumb is: Go an extra size for the building so that future requirements can be accommodated as well. Based on the type and style of the building, and its proposed use, you can calculate the roof height also.

For instance, aircraft hangars need clear span style with high roof structures. Church buildings with a high roof give a feeling of loftiness. Business offices can go with regular roofing. Depending on the amount of clear space required in the middle of the room, you can design the roof pitch.



Regular dimensions are calculated in increments of 10. Roof pitch ratio is the standard expression of the roof pitch. 1:12 is the standard ratio for the roof pitch. It means the roof rises 1 inch for every 12 inches of horizontal length.

Gabled buildings typically have a roof pitch ratio of 4:12. Higher-pitched roofs provide more cubic footage and space with little money. They are beneficial if you can utilize the space above the eaves. Low-pitched roofs allow you to cool or heat a room quickly. They are cost-effective as well. Determine where you would install framed openings.

Another important aspect is the orientation of the building. You need to consider predominant wind directions and sun rising angles when you plan the building orientation.

Cost

The price of the building depends on size, style, components and foundation.

- ✓ A small building of 30x40 dimensions costs \$10 per square foot.
- ✓ A large building of 80x100 dimensions costs \$7 per square foot.

This price is for the building shell. You can add 20% to this price for components like doors and windows. Additionally, you would need 8-10% for delivery and labor expenses.

In addition to the style and size of the building, you need to check the level of the ground:

- ✓ If it is low, you may need to raise the foundation of the building to the ground level.
- ✓ If it is hilly, you might need to flatten the ground to lay the foundation.

Prices for leveling the ground vary with your location and the size of the ground. Typically, 150mm of spoil is removed on a regular ground. If the top soil is good 50mm can be retained. The cost for leveling the ground is approximately \$25/m³.

Based on these prices, you can calculate the price for leveling the ground or raising it. It's important to consider this expense to your budget.

Another element is the natural drainage. Check out the drainage system in your area. You need to have access to other utilities like: water, gas, and electricity. Before planning your building, consider these aspects and determine the costs involved. There should always be room for expansion. When you plan the design, make sure that it is flexible to allow for future expansion. Considering all these aspects will give you a clearer picture of the overall costs required to complete the construction.

When it comes to steel buildings, cheaper is not always the right option. Even though you get the material at a cheaper price, missing parts and uneven holes make it difficult to assemble the material. This, ultimately, increases labor costs. Ensure that you are purchasing the material from a reputable manufacturer.

Lastly, steel prices fluctuate. The quotes given by the manufacturer should be valid for a certain period of time. Make sure this is stated in writing. During the construction season, prices often rise. It is wise to order the material beforehand so that you can lock the price. This avoids project delay as well.

Building Components

Before talking to a steel building dealer, as a purchaser, you must understand the technology and components involved in steel building construction. Being aware of these details allows you to work closely with the designer, choosing the right components and style. Your knowledge will also help you get a competitive price from the dealer.

An understanding of the components required for a steel building, installation procedure, and the technology required is vital. The following is a list of items involved in the construction of a steel building.

Kits

To construct your steel building, you need to purchase a steel kit. Prefab kits are powerfully engineered steel structures. Constructing these kits requires only regular man power and basic tools. Steel building kits are cut with laser-like precision into the desired frame. Your job is to merely affix them.



Steel building kits come in popular sizes and styles. Some of the popular ones are arch style and peaked roof.

However, you can customize these kits as well. Prices can range from \$5000 for a small garage to \$30,000 for a 40x60 shop structure. As the building size increases, the square foot price decreases price of the kit varies with square footage and accessories involved in the kit.

Structure	Size	Price
Car Garage for single vehicle	12X12	\$10,000
Car Garage for two vehicles	24X24	\$12,000
Garage for RV	40X20	\$14,000
Storage Building	30X24	\$13,500

Insulation

While steel buildings are durable, you need to augment them with proper insulation. Not only does it reduce energy consumption, it also enables you to control outside conduction of temperature. You can even get tax benefits in some areas.

The different types of insulation include:

- ✓ Loose-fill insulation: In this method, special equipment is used to blow loose fiber or fiber pellets into the building cavities. While this method is expensive, it effectively reduces air leakage and acts as an effective sound barrier.
- ✓ Batt and Blanket insulation: Batt and blanket insulation is the most inexpensive. It is used for walls, ceiling and floors. Batt insulation involves precut panels of mineral fiber or fiberglass of four to eight feet. Blanket insulation uses the same material in the form of rolls cut to specification.
- ✓ Spray Foam insulation: Spray foam insulation provides airtight insulation and is best suited to fill gaps of shaped structures. In this method, the liquid mixture containing a

polymer is sprayed on the walls, ceiling and floors. It expands and turns into solid cellular plastic. This method is more expensive than batt insulation.

- ✓ Right Board insulation: Right board insulation uses fiberglass, polyurethane, or polystyrene cut to desired thickness. This method perfectly suits flat roofs.

Steel building involves various components. Some of the common steel building accessories are listed here:

Windows

Windows are meant for proper ventilation and light. As they are self-framed and field-located, they can be placed anywhere in the building. You can choose from insulated or uninsulated models.

Doors

For steel buildings, doors come in a wide range of models. For framed openings, slide doors can be an economical choice. Alternately, you can purchase mechanized overhead doors. Self-framed walk-doors can be installed anywhere in the building. If you want more light inside the building, choose half-glass doors.

Ventilation

To maintain fresh air and optimum temperature inside the building, a proper ventilation device needs to be installed. There are different types of ventilation devices including: Wall Louver, Gravity Vent, Ridge Vent and Turbine Vent. For optimized ventilation, choose more than one ventilation device so that air moves between them.

Skylights

Skylights or roof lights augment the lighting inside the building. Normally, skylights are installed on either side of the roof peak. You can calculate the number of bays and purchase the required number of skylights.

End wall

As steel frames are pre-cut and prefabricated, they come with easily installed end walls. You can add certain features like heavy-duty curved angles, weather strip inserts or customize your own end wall panels.

Columns

Columns separate the space into segments. Depending on the style of your building, you need columns to break the large space into different rooms or sections. For clear span styles, you don't need columns but require powerful beams for the roof. For multi-span buildings, you need columns. They are installed as end walls as well.

Trim and Gutters

To maintain the aesthetic essence of the building, you need to install trim and gutters. They prevent the pooling of water and keep the sides of the building clean and beautiful. However,

you cannot use them with Quonset frames. Depending on the style of your building, you need to choose gutters, trim and downspouts to suit your building design.

Rafters

A rafter is a supporting beam for the roof. From the gutter to the apex, it follows the roof. When installing the roof, rafters are important components that support it. However, it depends on the style of the building you choose.

Questions to Ask a Dealer

While purchasing steel buildings, you need to determine the proper size, components and configuration to suit your requirements. A steel buildings dealer can help you in this regard. Choosing the right dealer for your building needs is not easy. You need to ensure that you are dealing with a competent professional who can provide quality service at reasonable prices. Here are certain aspects to consider before finalizing a steel building contract with your dealer:

Maintenance

Though steel buildings are durable, it is important to prepare a maintenance schedule to inspect the building regularly and make repairs, if required. A routine check needs to be done at least twice a year. If there is any repair, renovation or additional construction done, the building needs to be inspected immediately. The same is also true of buildings that have experienced extreme weather conditions. Make sure your dealer agrees to inspect your building twice a year.

Maintaining records with details of inspection and repairs done is important. Precipitation occurs when the building is exposed to extreme snow and/or rainfall. You need to redirect precipitation by adding gutters and downspouts.

Before hiring a dealer, check out the maintenance aspects and know whether the price is inclusive of maintenance charges. In addition, ask your dealer if they maintain records pertaining to the maintenance service. Your dealer should be able to manage everything for you in this regard.



Building codes and permits

When purchasing steel buildings, your dealer needs to ensure that the construction project adheres to your state's building regulations. Firstly, you need to find out if the place is reserved

for residential purposes or commercial purposes. Are there any fire safety regulations? Local authorities can provide this information.

To get a building permit, you need to submit a certified blueprint of the building. You need to provide details like the building height and size, location and function. In addition, you need to produce a letter of structural assurance and building schedules. The foundation details must be included. Make sure your dealer can handle all this for you. In addition, get insurance and warranty on the material and the building.

Climate considerations

While choosing a steel building, climatic conditions have to be considered. Check out what adjustments your dealer is going to make to the building project in view of changing climates. In areas where heavy rainfall is common, you need to add an extra layer of coating for weatherproofing. If the building may have to withstand hurricanes and earthquakes, you need to design the structure accordingly. Your dealer should inform you about these aspects.

Check out fire and safety regulations and ensure that they are followed. Softer lands need to be raised while hilly areas need to be leveled. While receiving bids for purchasing steel buildings, check out climatic conditions of your area. Then ask your dealer if he considered these aspects and if these expenses are included in the price.

Dealer specialties

Most importantly, your dealer needs to have expertise in dealing with steel building construction. Check out previous jobs this dealer has done. Does the dealer have the expertise to construct large buildings with required designs?

Check out the reputation of the dealer. Customer feedback can help you understand the work nature of the dealer. A professional dealer will tell you about expenses and provide a time-frame and schedule to be followed. A lower bid is not always the right choice. Compare the prices, experience, quality, and reputation before making an informed decision.

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