

Calmont Volvo Truck Centre - Butler Building

THE ADVANTAGES OF METAL BUILDING SYSTEMS

The advantages of metal building systems include “lower construction time and cost, flexibility of expansion, assured quality, energy efficient building envelope, architectural versatility and sustainability,” according to a 2020 article in the academic journal, Renewable and Sustainable Energy Reviews.[1]

Clark Builders has supplied and installed hundreds of metal building systems over the last 40 years. These buildings are located across North America, as well as internationally. This article explores the advantages of our pre-engineered metal building systems.



Shell Place MacDonald Island Park Expansion

Larger Clearspans with Less Weight

One of the main advantages for a metal building system is the ability for large clearspans. This makes them particularly well suited for applications such as hangars, warehouses, and sports and recreational facilities. A challenge with this type of structure is to maintain strength while also minimizing the amount of steel used. For example, for a 200-foot clearspan, the rafter beams on our metal buildings typically weigh around 40,000 lbs and are about 6 ft deep. If a conventional trussed tube system were used to achieve the same clearspan, the roof structure would likely be two or three times the weight. The beams would also be much deeper (10 ft or more).

As well as increasing costs for the material, using more steel makes the building more expensive to erect: It is heavier to transport, larger cranes are needed to move the components, and a deeper foundation is required to support the extra weight. Minimizing the weight of a metal building system reduces overall project costs.



Morinville Leisure Centre - Butler Building

Design-Build Shortens the Project Schedule

The design-build process significantly shortens the schedule, compared to the typical design-bid-build (DBB) process. The DBB process can be very lengthy: The building is designed and tendered to multiple contractors. Once the contract is awarded, the various trades produce shop drawings. The shop drawings must then be approved by the general contractor and the architect (and perhaps also by other consultants). In contrast, we collaborate with a manufacturer, such as Butler, from the beginning of a metal building project. During the design phase, we use the manufacturer's software, which creates shop drawings early in the process. With this software, we can design the structure to a medium level of complexity and review it with the client. Design changes can be made without bringing in consultant teams, which reduces time and expense. The client knows from the beginning that the design is realistically constructible. They can be confident that there will be no need for substantial design changes later — reducing the risk of extending the project timeline.

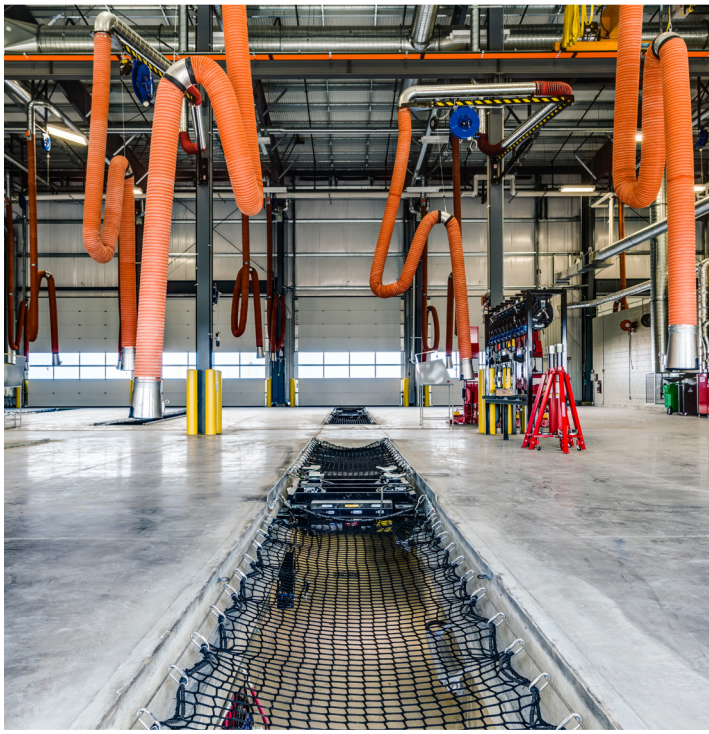
Rapid Site Assembly and Reduced Conflicts

With a metal building system from Clark Builders, little to no modification — such as field welding or cutting — is required on-site. Instead of different trades trying to fit their components together with another trade's components, we provide a complete system from a single manufacturer, such as Butler. To erect the building, only one crew is needed, and the components all fit together precisely to make a tight building envelope. Metal building systems are ideal for remote locations because they arrive in a complete package. Columns, rafters, roof systems, and wall systems are all included. There is no need to procure additional components or materials locally. In contrast with a conventional structure that involves many suppliers and trades, each of our metal building systems are manufactured and supplied by one company. There is also only one set of shop drawings required compared to a conventional structural steel design, where multiple sets of shop drawings are required from various disciplines including but not limited to structural steel, roof systems, steel stud wall framing and wall cladding systems. This means that conflicts between the drawings — and therefore conflicts in the construction of the building — are rare. If a problem does arise, it is easier and quicker to resolve when dealing with a single manufacturer and one trade.

Lower Costs and Cost Certainty

Prefabrication lends itself to the cost efficiencies of factory manufacturing, and a metal building system is a very economical package. Typically, only one trade is needed — rather than three or four — to assemble an entire building, which helps keep costs down. The shortened construction schedule also saves money. The less time a construction site is open, the lower the cost for builder's risk insurance and site security. It also means that a building is operational sooner, resulting in a quicker ROI for owners.

Metal buildings need little maintenance and have high energy performance, reducing life-cycle costs. For example, the expected life-cycle cost for a metal roof is 30 cents per square foot, compared with 57 cents for single-ply roofs.[2] Because pricing is built into the software that we use to create the shop drawings, clients can have cost certainty from the design stage.



City of Calgary, Fleet Services Maintenance Facility

Turnkey Supplier

Clark Builders is a complete turnkey general contractor for metal buildings. We can manage the entire design and construction process — including the foundation, structure, electrical, mechanical and all other trades. We can self-perform concrete, supply and install metal buildings, as well as supply and install various types of insulation and envelopes.

Because we self-perform a variety of scopes of work, Clark Builders can provide a complete in-house design-build service for metal buildings. This ensures high quality, safety, speed, lower costs, and cost certainty for our clients.

"Review of thermal and environmental performance of prefabricated buildings," Sisi Yu, Yanfeng Liu, Dengjia Wang, AbuBakr S. Bahaj, Yue Wu, and Jiaping Liu, Renewable and Sustainable Energy Reviews, October 2020.
"Low Slope Roofing Life Cycle Cost Analysis," Ducker Research Company, May 2005.

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