

Farm Structures FACTSHEET



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STEEL BUILDINGS FOR AGRICULTURE

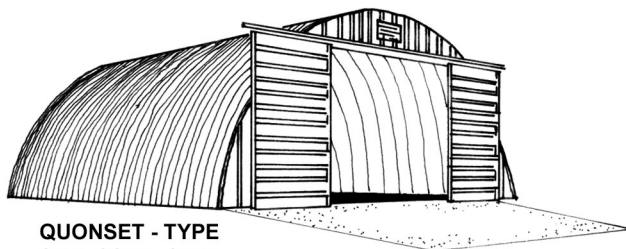
There are several different types of steel buildings being sold today for farm use. As with any type of farm building, the buyer should be fully aware of what they are getting from their dealer. Steel buildings, when properly selected and constructed, have good application on the farm. They are durable, have long life, are maintenance free and can be erected very quickly. This leaflet outlines some special considerations that should be carefully checked before signing the contract.

TYPES OF STEEL BUILDINGS

There are three basic construction types for steel buildings: Quonset-type stressed skin, straight-wall stressed skin and steel frame.

Quonset-Type Stressed Skin

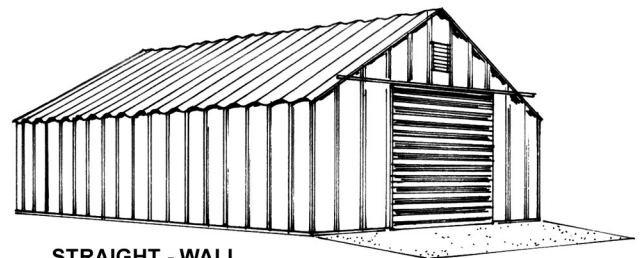
Curved, heavy gauge galvanized steel panels are bolted together to form a near semi-circular arch frame. There are no interior or exterior beams, columns or trusses to support the panels, all the strength is designed into the panels.



QUONSET - TYPE
STRESSED SKIN

Straight Wall Stressed Skin

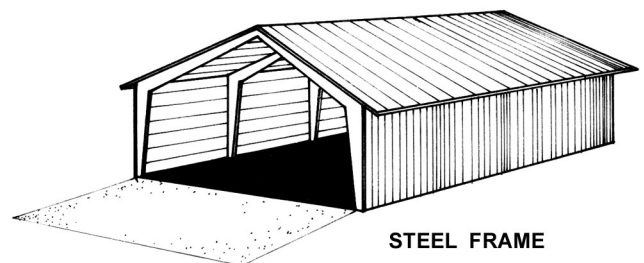
Similar panels as used in the Quonset-type building are used in a structure of more conventional shape with vertical walls. Roofs may be sloped, flat or gabled. No trusses or beams are required to support the roof for most sizes of these buildings.



STRAIGHT - WALL
STRESSED SKIN

Steel Frame

These buildings are available in a wide range of configurations and sizes up to 250 feet clear span width. A framework of steel members is erected and then light gauge steel cladding is attached to the roof and walls.



STEEL FRAME

CONSIDERATIONS WHEN BUYING A STEEL BUILDING

Selection

Steel buildings are sold all across the continent and there is a selection of design specification for a variety of snow and wind loadings. **The specifications of the building selected must be matched to the conditions encountered in the area where the building is to be erected.** Information on the required load carrying capacity can be obtained from the Building Inspection Department of Municipal and Regional Districts. **Never try to economize by selecting a building with lower design specifications than those required for the area.**

Steel buildings are often used for bulk storage of vegetables and grain. If they are used for bulk storage, be sure that the specifications for the building purchased demonstrate that they are suitable for that purpose. Generally, heavier gauge panels and a heavier footing are required for bulk storage buildings. Anticipate all possible uses for the building. Don't purchase a structure suitable only as a machine shed hoping it will serve as an emergency grain storage without first securing a certification that the building will withstand all anticipated loads.

In a survey conducted by the Provincial Ministry of Municipal Affairs, there were a number of failures reported of steel Quonset-type buildings. Some failed structures were improperly selected to suit local conditions for snow and wind loads or for the additional load imposed by the bulk storage of grain. Some buildings collapsed due to improper conditions. **It is critical to follow the manufacturer's instructions and specifications for the proper installation of the foundation and so that all panels and bolts are installed as required.**

Utilization

Steel buildings make good storages for machinery and supplies and also for bulk storage of vegetables and grain.

Steel buildings are flexible since they are expandable in length by adding extra panels or bays. Doors and windows can be cut into the end and

sidewalls, although putting openings in the sides of Quonset-type buildings is more costly than similar installations in straight wall buildings. Consult the dealer or manufacturers if additional openings are required because **specialty made frames are essential to maintain structural integrity.**

Insulation

Where insulation is required for machine shops, vegetable storages and intensive livestock housing, consider the practicality and costs to insulate steel buildings. Present energy costs show that high quality insulation with a value of R-20 (RSI 3.5) is recommended.

Exposed plastic insulation, including polyurethane and polystyrene materials, can cause catastrophic fires that flash through buildings in seconds. Poisonous gases are given off as a product of combustion increasing the hazard. Exposed plastic insulation, now prohibited from use under the *Fire Code of the National Building Code*, must be covered with a thermal barrier which can be an approved spray on material such as "Zonolite 3300", 1/2" gyproc or 1/2" plywood.

For Quonset-type buildings, the only practical insulation method is to spray on polyurethane foam to a thickness of about 3 1/2 inches to achieve a value of R-20 (RSI 3.5). A thermal barrier material is also required. Spray-on cellulose fibre thermal barriers do not withstand high humidity conditions that may occur in some building applications and is not recommended. Mechanical damage to the exposed sprayed on insulation may occur from birds, handling of stored products and from moving equipment should be expected.

For straight walled buildings, furring clips can be installed to attach strapping. A rigid plastic insulation can then be applied to the strapping. A thermal barrier is required so plywood or gyproc should be bonded to the insulation. This also protects the insulation from damage.

Ventilation

Ventilation of buildings is important especially in intensive livestock housing where large amounts of heat and moisture are produced. Ventilation system installation in steel buildings may not be as simple as it is in conventional frame buildings. The use of

continuous air inlets at the eaves or in the roof ridge may not be possible. Often the only suitable air distribution inlets are the perforated plastic duct and fan systems or roof mounted ventilators.

Corrosion

Corrosion problems with some steel buildings have been reported. It is possible that a white, chalky deposit may show up on galvanized steel panels. In time, the white deposits give way to pits of iron oxide rust which may lead to **pin holes in the panels**. The cause of this corrosion is probably due to ineffective galvanization and is compounded by high humidity conditions. Check the building contract for assurance against corrosion.

Costs

As with the purchase of any type of building, find out all the costs involved to finish the building on site before signing a contract. Check for the type of warrantee that may be available from the

manufacturer to protect your investment. When comparing costs for different types of buildings, consider cost for excavation, site preparation, concrete footings and slab work, erection costs, insulation, ventilation equipment, interior partitions, doors, windows and all other necessary equipment. **If the materials alone are bought as a building package, be fully aware of the total cost to put that building in place.**

Summary

Despite the drawbacks, steel Quonset buildings can be constructed properly and they do fill a need in the building industry for a variety of applications requiring a simple structure.

Irrespective of the type of building chosen, you should be sure that it is adequately designed to meet the predicted maximum snow and wind loading for your area. The old adage “better safe than sorry” certainly applies.

FOR FURTHER INFORMATION CONTACT

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