

# Understanding the Importance of Snowload Design



Most people take for granted the tremendous stress their houses, businesses, barns and storage facilities must endure throughout the winter months. These structures must support snow and ice, technically known as snow load, that falls during the winter. Sometimes, buildings collapse under the weight that can accumulate in a large storm.

The simple fact is, while all buildings are designed to carry some snow load, there's no guarantee that they will carry the same amount of snow load. And while most homes are required to be built well enough to survive winter's onslaught, snow load capacity requirements for non-dwelling businesses and agricultural buildings vary greatly. It's up to consumers to understand what they are buying.

## Understanding Snow Load

A load is defined as something borne, carried or supported by a building structure.

- "Dead" loads are the gravity loads caused by the weight of the structure itself.
- "Live" load is the load superimposed by the use and occupancy of the

building.

- "Collateral" loads include objects placed on or hanging from the roof of a building such as an air conditioning or ventilation system, or special lighting.
- "Environmental" loads include snow, wind and earthquakes.

Dead, live and collateral loads are known entities that can be accounted for in the building design process. But environmental loads, such as snow, are variable. You should make sure that whoever is building your structure understands load requirements and *will put in writing*, the loads required for your building.

Make sure you ask specifically about roof snow because it is easy to be confused when other types of "load" capacities are quoted. Snow load capacities depend on the building type, location, occupancy and primary use.

For non-commercial agricultural buildings, snow loads can range from 12 to 40 pounds per square foot, depending on the region. Snow loads are not set for all regions, so make sure your builder takes the local environment into account and establishes a suitable snow

load for your building.

Local building codes establish minimum standards for commercial building snow loads.

## Designing and Engineering Considerations

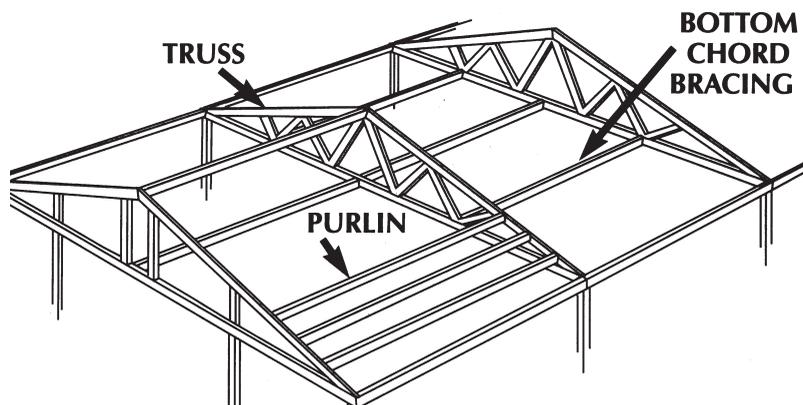
Proper design is key to establishing sound snow and wind load capacity for your building. For example, Lester engineers consider the building type and primary use, then calculate how much snow is expected to accumulate on the roof based on available average annual snowfall data. This helps identify potential problem areas so they can design solutions before the building is manufactured and constructed.

Where you build matters, too. Buildings near larger structures, such as other buildings, trees or silos are more likely to collect drift which increases snow loads. You should talk with your Lester builder about your building site so they can inform Lester engineers to make proper design adjustments, if necessary.

This goes for buildings with multiple roof lines, peaks, valleys and dormers too. All of these tend to create valleys and backslopes that can collect snow.

## Lester Buildings: Designed for Durability

A building is only as strong as its weakest link. That's why it is so important that individual components be designed to fit and work together. Lester-engineered framing systems are design-integrated to perform predictably in snow and other environmental "stress events". This design philosophy greatly enhances a Lester building's ability to withstand the loads for which it was designed. No weak links equal strong, predictable performance.



Some of the essential components of a typical (Uni-Frame) Lester engineered building.

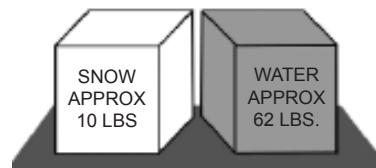
Some examples:

- Trusses are the backbone of a building. Lester engineers and fabricates trusses to exacting standards - your building's requirements. You can be sure that only quality trusses go into your building.
- Purlins are typically flush-set in heavy-duty metal pockets, eliminating purlin roll, creating a stronger overall connection.
- Lester incorporates bottom chord bracing that run the entire length of the building. Bracing is also set into heavy-duty metal pockets providing additional stability.
- While many Lester buildings have a 4:12 roof pitch (four inches of rise to every foot of run), the roof pitch can be varied to further reduce the chance of snow build-up. Lester Uni-Rib™ steel roof panels allow snow to slide off the roof more easily.
- The Lester Warranty. Our manufacturer's warranty stands apart with lifetime protection for snow and wind loads not exceeding design parameters.

## Snowload FAQ

### Q: How much does snow weigh?

A: A cubic foot of water weighs about 62 pounds. Generally speaking, one cubic foot of snow weighs approximately 10 pounds. This weight can vary greatly depending on moisture content of the snow, wind and other environmental factors.



### Q: What is the average snowfall for my area\*?

A: While average annual snowfall (in inches) can be obtained from the National Weather Service, here are some examples:

Albany, NY - 64"	Grand Rapids, MI - 73"
Portland, Maine - 70"	Harrisburg, PA - 34"
Bismark, ND - 41"	Indianapolis, IN - 24"
Buffalo, NY - 94"	Madison, WI - 44"
Concord, NH - 64"	Minneapolis, MN - 50"
Dayton, OH - 27"	Sioux Falls, SD - 41"
Des Moines, IA - 33"	Springfield, IL - 23"

\*Snowfall averages for major reporting locations can be found at:  
<http://wlf.ncdc.noaa.gov/oa/climate/online/ccd/snowfall.html>

### Q: What are the dangers of high levels of snow accumulation?

A: Excessive snow accumulation is one of the biggest threats to structures built in northern areas of the U.S. As an example, during the winter of 1996-97, heavier than average snowfalls throughout the Midwest caused more than 5,000 buildings to collapse. Many of them were agricultural buildings.

### Q: Why choose a Lester engineered system?

A: Lester incorporates expert engineering and quality components to develop a engineered building that performs predictably as one tight, integrated system.

### Q: How will Lester engineers know how to design my building?

A: Your independent Lester builder will work with you and company engineers to ensure that you get the right building to suit your needs. For agricultural buildings, that might mean establishing a snow load capacity (if one is not listed for your area) and making sure the building is designed for that load. For commercial buildings, that means working with local code officials and your Lester dealer to identify code-specified building loads.