

TPIC Technical Bulletin #2

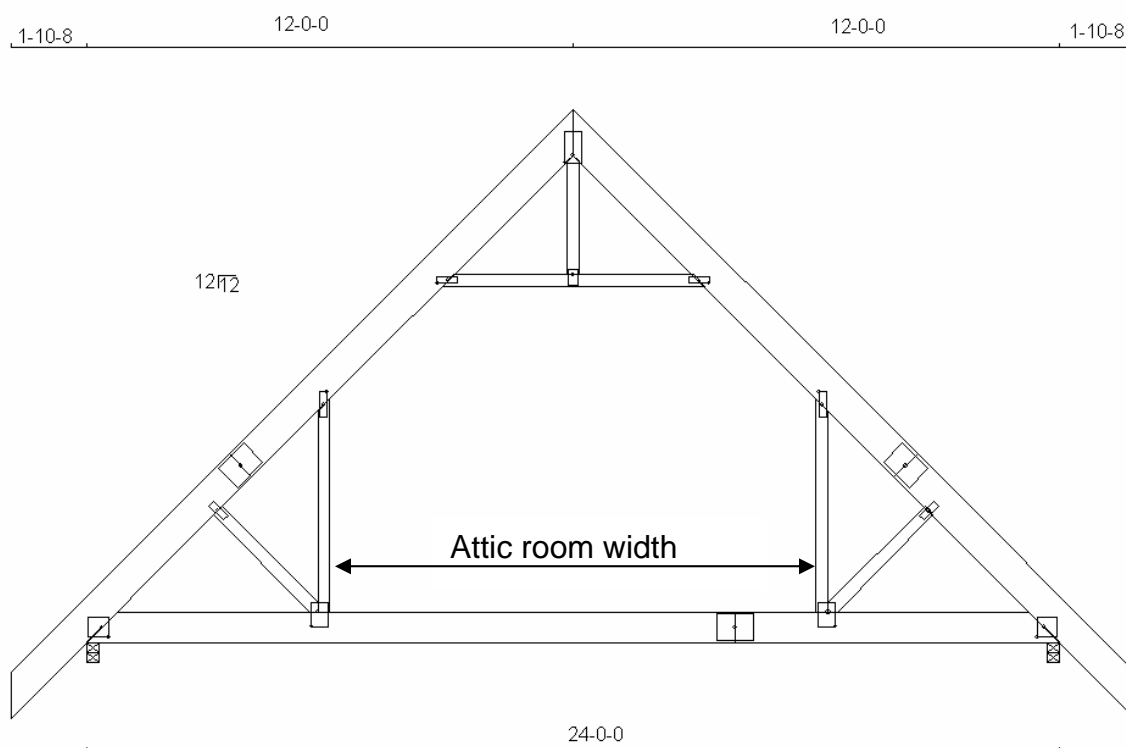
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Load Considerations when designing Attic Frames

This bulletin details the required load cases for design of Metal Plate Connected Attic Frames.

Attic frame has unique features, different from triangulated truss, that require special attention in the design process. Attic frames are not fully triangulated, hence the term “frame” and have large areas within the profile used for living areas and/or storage spaces. Some have used the term “Bonus Room” in describing the open area within an attic frame.

A typical Attic Frame is shown in the figure below:



Typically, attic frames are used in Part 9 Buildings, but by their very nature, they are statically indeterminate structures that require special loading considerations. Since Part 9 deals with only the very basic load requirements, it is recognized that the load requirements of Part 4 of the National Building Code of Canada, latest edition, shall be used to determine the appropriate load cases when designing an attic frame.

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Specified snow load, live load and dead load, for attic frames, shall be determined based on the requirements of Part 4 of the National Building Code of Canada irrespective of building occupancy category.

Minimum specified bottom chord live load of 10 psf (0.5 kPa) need not be applied when live load in the floor area is equal to or greater than 30 psf (1.4 kPa) since the applied floor load will meet the minimum live load requirement.

In lieu of vibration analysis that is normally performed on floor framing assemblies, the attic room width shall not exceed 22 times the depth of attic floor member.

Special consideration shall be given to include additional load cases when there is an internal bearing inside the room area. The attic frame is required to be designed for the most critical load case that it may encounter during its service life.

The following load cases shall be considered in the design of attic frames irrespective of occupancy category of the building.

- 1) $1.25D+1.5SU+1.0L$
- 2) $1.25D+1.5SL+1.0L$
- 3) $1.25D+1.5SR+1.0L$
- 4) $1.25D+1.5SU+0.4WR$
- 5) $1.25D+1.5SU+0.4WL$
- 6) $1.25D+1.5SL+0.4WR$
- 7) $1.25D+1.5SR+0.4WL$
- 8) $1.25D+1.5L+0.5SU$
- 9) $1.25D+1.5L+0.5SL$
- 10) $1.25D+1.5L+0.5SR$
- 11) $1.25D+1.5L+0.4WL$
- 12) $1.25D+1.5L+0.4WR$
- 13) $0.90D+1.4WL$
- 14) $0.90D+1.4WR$
- 15) $0.90D+1.4WPL$
- 16) $0.90D+1.4WPR$
- 17) $1.40D$

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Where:

- **D – Dead Load**
- **L – Live load due to use and occupancy**
- **S – Snow load without specific reference to uniform or unbalanced load**
- **SU – Uniform snow load (includes rain)**
- **SL – Unbalanced snow load on left side of truss (includes rain)**
- **SR – Unbalanced snow load on right side of truss (includes rain)**
- **W – Wind load without specific reference to directionality**
- **WL – Wind blowing from left**
- **WR – Wind blowing from right**
- **WPL – Wind generally blowing parallel to ridge but from left**
- **WPR – Wind generally blowing parallel to ridge but from right**