Benefits of using Cold Formed Steel roof trusses

FRAMECAD®
The way the world constructs

Cold Formed Steel is an incredibly versatile material used worldwide

In the United States (US) and Great Britain CFS has been used in building construction since the 1850s. In the US Cold Formed Steel is becoming the material of choice for the structural components of mid-rise and multi-family buildings, for family and student accommodation, aged care facilities and hotels.

CFS is being used in many other countries worldwide, below are some examples:

- **In China** CFS trusses are used extensively for low-rise dwellings and apartments up to six levels because it's fast and economical. CFS has also been used successfully in buildings over 10 levels high.

- **In South East Asia** CFS trusses have been used extensively for many years on low rise and multi-family buildings as this has proven to be the most economical and resilient construction method.

- **In Africa**, particularly in fast growing urban areas, the building and construction industry is using CFS widely for low rise and multi-family buildings. The fast fabrication and ease of construction, even for unskilled labour, allows the South Africans, for example, to build more quickly and cost-effectively to address the nation's housing shortage. At the same time there is a shortage of good quality, affordable timber throughout Africa. Many suppliers provide a low-quality product, a practice that incurs considerable risk. Roof trusses built with low quality timber are inconsistent, structurally weak, and of potential danger to the end-user. CFS has proven to be a reliable and cost-effective substitute that is experiencing exponential growth in the Sub Saharan Africa Market.

- **In the Middle East** CFS is used for apartments, modular building, houses and commercial buildings. Because it is easy to assemble, CFS is becoming a material of choice in parts of the world where skilled labour is hard to find and timber is in short supply.

- **In Australia** CFS takes around 15 percent of market share. As termites and other pests don't eat steel, Australians find CFS is an ideal and robust alternative to timber framing.

- **In New Zealand** CFS is catching on both in commercial and residential sectors. House shapes are now far from the simple rectangle and roofs have a lot of valleys, ridges and hips, which can be quite complex to figure out. However the engineering software that designs CFS framing makes the most elaborate architectural designs easy to achieve.

FRAMECAD operates in all these markets. The company is a market leader, providing the industry with their comprehensive package of CFS engineering, detailing software and equipment, all of which enables customers to construct in the most effective and efficient way using CFS.

Click here to read our case studies

"Excellent alternative to wood"

Cold Formed Steel trusses have the same capabilities as wood trusses. But there are additional advantages. They are lighter and in every way more a than timber. Most CFS roof trusses are pre-engineered and prefabricated with the help of computer software. This design flexibility makes Cold Formed Steel trusses ideal for almost any building type, including residential, commercial, institutional, educational and industrial structures.

Why using Cold Formed Steel for roof trusses

- Advanced software can create roof trusses for any architectural roof design and roof load. This means that more complex designs can be achieved.
- Flexibility of choice. The wide range of sizes, thicknesses and strength of CFS offers engineers flexibility in selecting the appropriate material for the design requirements.
- Superlative material properties. Compared to wood CFS is lighter, recyclable, more durable and not affected by moisture, mould, rot, or pests, and it doesn't need to be treated with chemicals.
- No issues with drying time or waste. The production process is so consistent that there is delivery certainty. The engineers and manufacturers know exactly how long it will take to make the components. There are no variables and there is installation support on site as well.
- CFS structural design works well through design collaboration with the owner. On a big project it is useful to design a steel frame early on, involving the architect, client and engineer.
- The excellent strength-to-weight ratio of CFS produces strong, light structures – an added advantage in quake prone areas.
- Automated design and manufacturing processes are quick and precise to less than a millimeter. They are highly cost-effective, involving less billable engineering time, faster manufacturing time and reducing rework to almost zero.
- Non-combustible. CFS does not catch fire, which is of particular concern when a building is under construction.

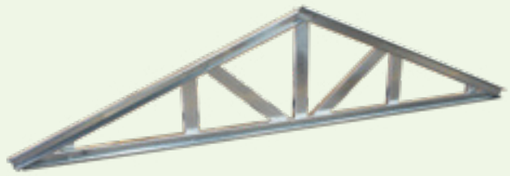
FRAMECAD software is sophisticated. Any type of architectural drawing can be imported and different options generated, tested and peer reviewed. It allows accurate pricing early on and certainty about build time and cost.

Back-to-back vs Inline trusses

CFS trusses can be designed and manufactured in many different ways. The most popular ways to design and manufacture trusses are either with an inline truss or a back-to-back truss. Both systems are able to be designed and manufactured using the FRAMECAD solution. Below are some comparative features of both systems.

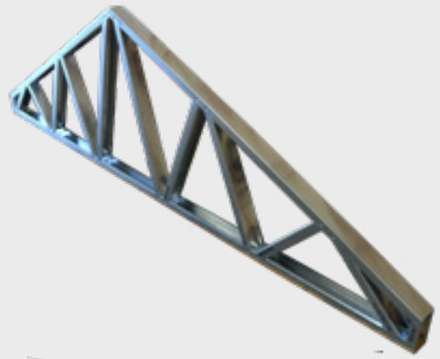
BACK-TO-BACK TRUSSES

- Faster to produce than inline as fewer tooling options required
- Less material required
- Can be engineered for larger spans
- Cutting edges require more safety precautions
- Need to be braced during erection



INLINE TRUSSES

- Easy to manufacture and transport
- Easy to install onsite
- Safer to use
- Doesn't require bracing during erection and sits well on top of walls



The most popular roof trusses

There are many different roof shapes that need to have trusses designed for them. Below are some of the most popular roof shapes all of which can be engineered, designed and manufactured using the FRAMECAD solution.

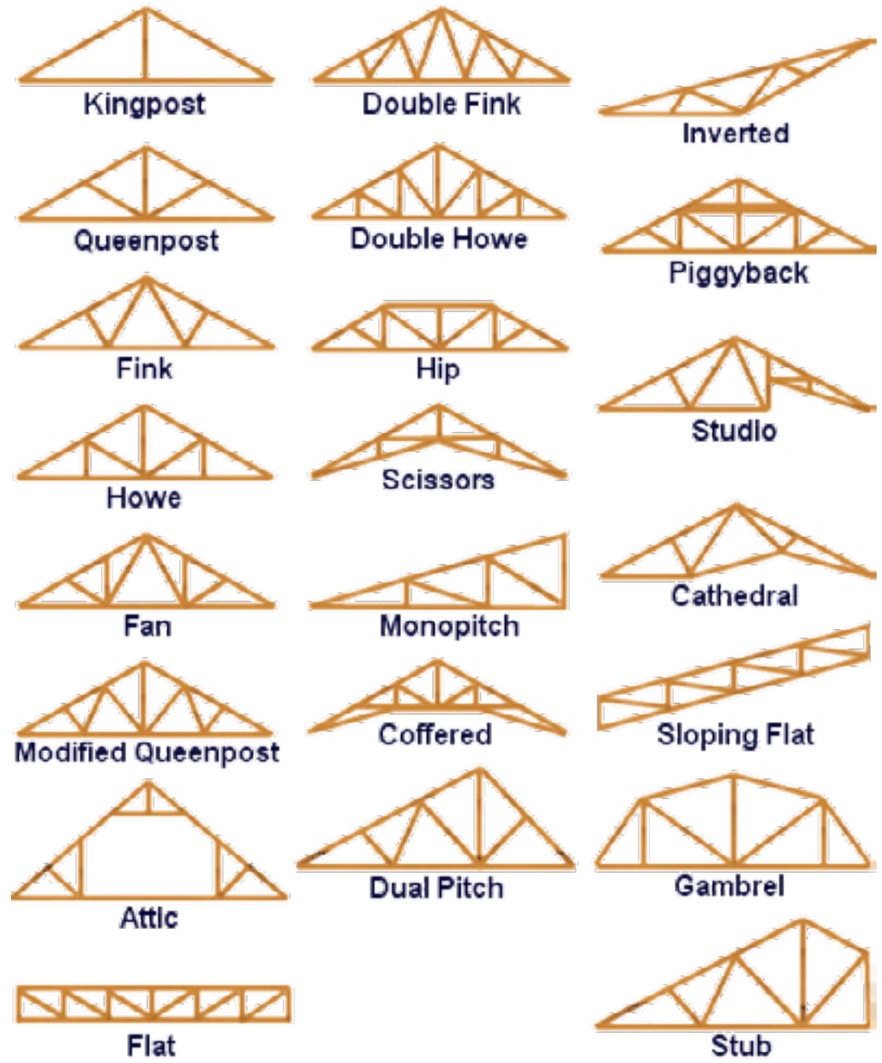
- The *hip* roof has slopes on all four sides. The sides are all equal length and meet to form a ridge at the top. Common hip roof types are: simple hip, cross hipped and half hipped. Typical trusses used for hip roofs are: the *common*, standard truss and the *fink truss,* shaped as an equilateral triangle. The Fink truss is economical in terms of steel weight for short-span high-pitched roofs as the members are subdivided into shorter elements. There are many ways of arranging the chords and webbing.

- Also known as pitched or peaked roof, the simple, triangular gable roofs framed with various types of *gable truss* are some of the most popular in the US.

- The *gambrel* or barn roof, also called a Dutch roof provides extra living space for an attic or loft and is easy to frame out. The gambrel uses just two roof beams, along with gusset joints. It is a cost-effective option since the construction is quite simple with fewer materials needed.

- The *attic truss* also allows for more space, leaving most of the area beneath the roof open and framed. A common attic truss in residential construction is the Double Cantilever style.

- Flat, *monopitched* roofs with a small angle for water run-off have *parallel- chord* or horizontal trusses.



- V-shaped *butterfly roofs,* with *butterfly trusses,* are popular for modern, Eco-friendly home designs. The mid-section valley allows for easy water collection and the angled roof sections can incorporate PV solar panels, water collection systems and natural lighting.

- Depending on the roof, the materials used and the ceiling shapes, other trusses commonly fabricated in CFS are: *the fan truss,* the *double fink,* the *double-howe truss* and *scissors truss.*

Summary

CFS trusses are used all over the world to meet the construction needs of local markets, enabling construction companies to engineer, design and manufacture trusses and other structural components to meet their local needs.

The FRAMECAD system offers the perfect solution for your roof trusses construction needs. FRAMECAD technology enables to delivery your project faster and more efficiently which simply cannot compare with traditional methods.

Talk to your local FRAMECAD expert to understand how FRAMECAD can help you meet your construction needs.

TALK TO US →