

An Introduction to Light Gauge Steel Framing: **For Architects**





What is Light Gauge Steel Framing?
Benefits for the Architect
FAQ's about Steel
Relevant Building Codes & Standards
Simple Process from Desi to Delivery

Welcome

Whether you're starting concepts on a single family or multi-family residential or commercial project, your choice of materials has a big impact on the final result. From the scope of the design & detailing, to on site installation and durability, the right material plays a big important for client satisfaction. It can also be the difference between your project exceeding expectations, meeting the required codes, and standing the test of time – or unfortunately, failing to do so.

Light gauge steel framing (also known as cold form steel framing) is rapidly gaining momentum as the material of choice for a growing number of architects and designers alike. Working with light gauge steel (LGS) framing for structural walls, floor joists and roof trusses offers a host of noncombustible benefits during both the design and construction phase. Maybe you've heard about LGS framing but haven't explored it further? Or perhaps you have some understanding of the benefits but are not sure whether it's worth making the change from traditional conventional alternatives? Either way, if you're an architect looking for new ways to drive innovation and efficiency with non-combustible materials, read on to discover how LGS framing can give your projects the edge.

What is Light Gauge Steel Framing?

LGS framing system consist of structural frames fabricated using cold formed steel sections. They can be used throughout a structure, including load-bearing exterior wall, interior non load bearing walls, floor joists, curtain wall and roof trusses. LGS framing is becoming more of a common material used on construction worksites.

At steelsoft, we use reputed steel and prior approved from codal provision as it has a far superior corrosion resistance than many other commonly used materials, is noncombustible and is suitable for use on residential and commercial projects of all relevant applications. Importantly, it is also flexible and can be fabricated and engineered as required to suit your exact design needs. This opens the door of increased design possibilities and smarter efficiencies across the entire project.



Steel is flexible and can be fabricated and engineered as required to suit your exact design needs.



Benefits for the Architect

Working with non-combustible LGS framing allows for design flexibility that is not possible with traditional conventional framing solutions. The high strength-to-weight ratio reduces the need for intermediate columns and load-bearing walls. This gives the ability to utilise long spans and allows you to incorporate services within the floor.

The bonus of greater open spaces is a feature of many of the most impressive modern buildings of today.

CFS steel framing can also help you tick many of the boxes when it comes to quality, longevity and compliance. It is straight and true, termite proof and provides enhanced corrosion resistance, which gives developers and homeowners complete confidence that it will perform and stand the test of time. It is also non-combustible (which can enable your design to meet the requirements of building in high bushfire risk areas) and is rigorously tested to ensure compliance with global



High strength to weight
ratio6Non-CombustibleLong Spans for greater
open spaces7Straight & TrueCorrosion Resistance8Superior Seismic &
Wind performanceIncorporation of
services9Light Steel is GreenSpeed of construction10Increased ductility &
toughness

Build with Steel on Site

On site, the benefits are clear too. Steel framing is pre-fabricated in our controlled factory environment, with precision and accuracy, then passed through our QA check and delivered to site ready to be installed. Many builders find our lightweight frames are faster and easier to handle and fit than traditional framing choices such as timber and or complex heavy structural steel.

The speed of installation and reduction in labour can result in substantial time and cost savings on larger projects.

In tight spaces or difficult sires, the streamlined installation process of the lightweight framing also makes a big difference. And because pre-fabricated framing is straight, accurate and true, the time spent on adjustments is minimal and material wastage significantly reduced.

FAQs About Steel Framing

If you're like most architects, you've likely got a few questions about the suitability of light gauge steel for your next project. Here are some of the more common questions we get asked.

What kind of cladding materials can be applied over light gauge steel walls ?

Light gauge steel walls can be cladded with any cladding material that are typically used for traditional building materials. Cladding such as gypsum board, cement board, magnesium board, calcium silicate board, sheet steel, vinyl siding, brick, brick veneer, stone veneer, stucco, EIFS, hardy planks, sandwich foam panels, corrugated sheet metal are just a few of the claddings that have been used for steel framed walls.

When choosing a cladding material, one must ensure that adequate thermal, sound, and fire (when required) insulations are provided. In addition to that, the cladding material shall provide adequate shear bracing or shall be combined with other shear bracing methods to satisfy structural requirements.



Can pre-fabricated steel frames be used in designs where thermal efficiency is required ?

Yes. Through insulation, lining and appropriate cladding, LGS framing can be installed to deliver varying levels of thermal efficiency.



How durable is light gauge steel framing?

Very. The distinctive aluminium/ zinc/ magnesium alloy coating on steel frames protects against corrosion. This gives the framing a long and almost maintenance-free lifespan.



Is light gauge steel framing strong enough for structural walls and multi-level buildings ?

Yes. Light gauge steel is strong by nature and our framing systems are well engineered to meet the relevant structural requirements of National building code and International codes.



Are there any standard cold-formed steel shapes??

There are no standard shapes for CFS like that of hot rolled steel. However, the most common shape is the 89 mm (3-1/2") C-stud. Other common shapes are the 150 mm (5-1/2") stud and the 250 mm (10") joist. In some countries there are trade associations that standardized the CFS shapes to simplify the use of CFS members by engineers, architects, and specifiers. For example, the Steel Stud Manufacturer's Association (SSMA) in the United States, the webs, lips, and flanges



What special precautions are taken to keep steel studs from buckling?

Steel studs are typically braced at mid-height. Tall steel studs are braced at 1.2 m (4') maximum intervals with lateral steel straps or channels, sheathing panels and interior gypsum panels, securely screwed to the studs, provide the major mechanism against buckling (weak axis bending).



How much steel is in a typical square meter of floor area in steel framed building?

This question cannot be easily answered without having additional information. The amount of steel depends on many factors such as complexity of the structure, number of rooms & stories, environmental conditions (Wind, Seismic snow etc), occupancy of the building (Residential commercial etc) and steel specification.

Once the required factors are known, the designer can look at the building and perform a quick check to estimate the weight of the steel per square meter or foot. Some companies have developed a rule of thumb based on their product (equipment, steel, and software). FrameCAD system for example, estimates that for a one-story residential building the weight of steel is approximately 18 kg/m² and for a two-story building the weight is approximately 25 kg/m². These weights are approximate and cannot be used for estimating or designing projects



How many stories can a cold form steel framed building up to ?

There are several 8-story buildings that have been constructed in the USA and Europe using cold-formed steel. The first 8-story building that was constructed in the USA was done in 1999 in Seattle, Washington (a high seismic area).

The entire building was economically constructed of cold-formed steel. Mid-rise buildings (5 or 6 levels) are also very popular and have been done for the past 20 years or so. It is to be noted that the limitation on the number of stories is not because cold-formed steel cannot be designed for higher levels but rather in most cases it is not economical to go over 8 stories at this time.

In India, we designed G+4 storey purely in cold form steel framing and more than 5 stories structures build using combination of cold rolled steel and hot rolled steel.



Where I can find more information about cold form steel structure?

There are many sources where you can find information about the design and construction of coldformed steel framing. A lot of that information can be found on the web site. You can also attend one of the training academies that are held by FrameCAD (www.framecad.com). In some countries there are cold-formed steel associations that you can join to get valuable information about the industry and the products. The following are some recommended resources that you can check out:

www.framecad.com www.bmptc.org www.steelframing.org www.**nashnz.org.nz** www.**nash.asn.au** www.sasfa.co.za www.cfsei.org



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Can I build LGS framing structure on existing RCC structure?

Yes, in fact LGS structure has an advantage over concrete structure due to light weight, but you have to find out few things. Since there are a lot of design components that need to be considered and evaluated. It is highly recommended that you hire a structural engineer who has the experience and knowledge about design of cold form steel framing.

- Find out whether existing structure is load bearing structure or RCC framed structure.
- Find out dimensionally the existing structural framing members.
- Check evaluation of existing structure capacity by several available methods
- You also need to check the adequacy of the foundations to support additional storey.
- Make proper connection of existing to new LGS framing structure.





Relevant Building Codes and Standards

Our pre-fabricated steel framing complies with all the relevant global building codes and special codes specifically for cold form steel structures.

Why our Clients like Steelsoft Artificial Intelligence

ntegrate & Coordinat

We are capable of creating documentation from our building models for projects so that owners & clients can view the structure along with architecture and MEP systems simultaneously before the facility is built.

Analyze & Connect

Engineering Analysis program exports assist in creation of the BIM models in order to diagnose current design challenges and prepare for future architecture or infrastructure work. Combining architectural models with information collected from fields surveys of existing conditions creates an improved understanding of structural issues and allows options and solutions to be explored



Evaluate

Construction Preparation

During the design process and before construction begins, BIM allows the design team, clients and contractors to address clashes and conflicts. Export from BIM software in the form of IFC transmissions allow designs to be viewed in Revit link integration. This process effectively helps save time and money throughout the length of the project. Simple Process from Design to Delivery

At steelsoft, we've been designing and building with LGS framing since inception. Working closely with developers, architects and builders for a long period of time, we understand the unique challenges and project requirements that are required to be overcome. Our smarter building solutions have resulted in time, cost and labour savings right across multi-level townhouses, top level structures, aged care, educational projects and other commercial developments. We understand how important the structure is to a building - with over 1000 successfully completed projects globally, we have the experience to solve engineered viable alternatives.

We strive for complete client satisfaction from the initial project handover to completion. We work closely with all stakeholders including the architect, builder, installer and contractors as required to achieve these outcomes.





Through our value engineering process and internal design knowledge, each project is analysed according to the global codes to reduce as much structural steel as possible. This results in smarter solutions, benefits, and savings for every build.

For years, we've challenged the traditional mindset of building by focusing on smarter engineered and more flexible systems for top level structures, aged care, educational projects and other commercial developments.



Each project is unique in design, scope and detail. Therefore, communication in estimating is critical to guarantee the right engineered design scope has been thoroughly detailed for a successful outcome.

Our quotation submissions are subjected to strict software analysis, detailing the design of the proposed project, engineering requirements and marked up plans.



We use the latest software to shop detail framing in-house to meet the relevant codes and project specifications which are 3D modelled, coordinated and signed off with the client.

Our combined framing systems are calculated and certified by our in-house registered structural engineers.



Framing is approved and checked prior to manufacturing before being prefabricated in our factory using state-ofthe-art machinery. Framing is integrated directly with the CAD software for precise and accurate results, every time.

LGS framing is then QA checked before delivery and transported to site, ready to be installed.



Throughout the process, we have dedicated on site support to coordinate with the client and the installation teams to ensure everything is being delivered on schedule and according to the design shop drawings.



Project Application





Roof Top Structures



Hotel & Resort



Quick Response Building



Solar Panel Mounting Structure



Townhome & Apartment



Office & Commercial



Modular & Stack Structure



Façade Structures

How Steelsoft Can Help

It's always a great decision to switch from the old tried and true methods to something new. But the truth is, in today's ever-changing market, finding new and innovative ways to push the boundaries and find cost and on-site time and labour efficiencies is key.

Since inception, we've assisted many architects, developers and builders to discover the possibilities of steel framing - we have the expertise and knowledge to achieve the best outcomes.

So, whether you're in the early stages of the design process, or already have the plans drawn up, we're happy to offer advice about how choosing light gauge steel framing can benefit your project.

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Our Design Presence Globally

