

The Future of Construction.

The case for building with Cold Formed Steel.





*In the new world it is not the big fish
which eats the small fish. It's the fast fish
which eats the slow fish.*

Klaus Schwab,
Founder and Executive Chairman, World Economic Forum.



Introduction.

We live in a world that is in constant motion. Technological innovation is reshaping old business models and approaches, and this is true even for brick-and-mortar industries like construction.

Over the next decade, the global construction industry is expected to grow, especially in emerging economies of Asia, Latin America, the Middle East, Africa, and India. To take full advantage of this market growth, construction companies must find a way to turn architectural inspiration into commercial reality faster and more cost-effectively than ever before, and success will come to those who are able to differentiate themselves in a crowded market.

In this eBook we'll examine forces driving a change in attitudes towards traditional construction methods, and look at how emerging technologies such as Cold Form Steel (CFS), also known as Light Gauge Steel (LGS), are reshaping the buildings of the future.

We explore the advantages of steel structures over traditional construction methods, and share the different building applications that can be achieved using CFS and how, as a project owner, developer or builder, building with CFS and in particular, the Millennium Green international System, will drive ROI and value for your business.

The Millennium Green international Design and Build methodology is all about the rapid construction of quality buildings. We're the fast fish. Which one are you?

Cold Formed Steel or CFS is also known as Light Gauge Steel or LGS. CFS buildings are designed using specialist computer aided design and engineering software and manufactured by rolling or pressing steel into semi-finished or finished goods at an ambient temperature.



CHAPTER 1

What is driving the shift towards alternative methods of construction?

CHAPTER 2

6 reasons why CFS is a superior construction method for the future.

CHAPTER 3

What to look for in a CFS Partner.

The background image shows a construction site with a white spirit level resting on a concrete surface. A rebar is visible in the background, and the entire scene is overlaid with a semi-transparent green filter.

CHAPTER 1

What is driving the shift towards alternative methods of construction?

As the world around us evolves, so must our building systems and processes. There are many factors driving a change in attitude towards how communities are built. Social, political, economical and environmental forces, as well as technology and the growing scarcity and expense of skilled labour-forces – are all factors contributing towards a shift away from traditional methods of construction, in almost every market.



CFS is revolutionizing construction.

Newer construction methods using Cold Formed Steel (CFS) also known as Light Gauge Steel (LGS), are revolutionizing the way buildings are created.

Offering improved quality, speed of construction, design flexibility and environmental performance, these modern methods are financially attractive alternatives to slower, resource-heavy traditional methods of construction, such as timber, concrete and hot-rolled steel.

Millennium Green international is a global player in steel construction with relationships across industry leaders, governments and businesses around the world. We are witnessing a number of key trends that are reshaping the future of construction.

In this section we examine each trend in terms of its influence on construction methods.



TREND 1

Rapid urbanization is driving change

The world is undergoing the largest wave of urban growth in history. More than half of the world's population now lives in towns and cities, and by 2030 this number is forecast to swell to about 5 billion¹. It is estimated that over the coming decades, a new city of 1.5

million people will have to be built every week or 96 000 houses per day to meet growing demand in the world, and that by 2030, 70% of the world's population will live in large cities².



Sources:

1: <http://www.unfpa.org/urbanization#sthash.dC7YB3YK.dpuf>

2: <http://www.environmentalleader.com/2014/04/24/sustainability-trends-drive-change-in-the-housing-industry/#ixzz4DIWgPdfc>

3: <http://www.smartcitiesindia.com/aboutus.aspx>

Urbanization is at a historical peak, driving construction demand.

Meeting the global challenges of growing populations and increased construction demand are key issues facing urban planners, developers and builders today. Slow, resource-heavy traditional methods of construction in many countries simply cannot keep

up with the pace, requirements and demands associated with rapid urban development. At the same time, governments and regulators – not to mention consumers – are demanding quality, safe and attractive buildings.

Traditional construction methods are too slow to meet demand.

An increase in urban redevelopment, both in the refurbishment and expansion of existing structures, is also a consequence of growing cities. Traditional construction methods are often impractical and uneconomical for this redevelopment. Alternative

methods of construction using steel framed structures with innovative industrialized process help answer all these challenges, allowing for buildings to be constructed faster, higher, lighter-weight, stronger and more accurately with less waste.

CFS provides faster construction with less waste.

In India, a country that is expected to add about 500 million people to its already dense urban population (377 million in 2011) by 2050, Cold Formed Steel is a popular choice of building material for the rapid construction of proposed 'Smart Cities' which will transform the lives and living conditions of citizens through better urban planning, smarter and greener buildings, and cleaner energy.

India is expected to emerge as the world's 3rd largest construction market by 2020, adding 11.5 million homes every year – a target impossible to achieve using only traditional building methods.



TREND 2

Demand for sustainable green buildings

Related to the trend of rapid urbanization, is increasing demand from governments and communities for the better use of resources and energy. People are demanding warmer, safer,

quieter buildings that can be constructed with less material waste, and that have a longer life-span.

CFS has environmental benefits traditional methods can't match.

In short – everyone wants ‘better buildings’ that are low maintenance and cost efficient to use. Around the globe, sustainable building standards are being developed and applied with a ferocity never seen before — the BRE Environmental Assessment Method (BREEAM) in the UK, LEED in North

America, Green Star in Australia, HQE in France and in particular, the Building and Construction Authority (BCA) of Singapore — who have set critical goals and initiatives for greener buildings, the construction industry and our environment.

In Singapore's densely built-up urban environment, with limited land space and few natural resources, green buildings are vital to sustainability. A 'Green Building Masterplan', brings together financial incentives, legislation, industry training programmes and a public outreach campaign, concentrated on driving the green building agenda in the industry, and making green building the norm for new projects.

Singapore has mandated a government funded projects to get 15% of the building projects developed offsite. Cold Formed Steel sub-components and pods are an ideal methodology to address this type of construction due to their outstanding strength to weight ration and transportability.

So by 2030, the BCA aims to have 80% of its buildings certified green — that is, energy and water efficient, with a high quality and healthy indoor environment, integrated with green spaces and constructed from eco-friendly materials.

Resource hungry and waste 'unfriendly' traditional building methods play no part in this new plan. To meet Singapore's green initiatives, alternative building materials and methods, such as CFS, are being implemented to meet the plan's ambitious environmental benchmarks.



https://www.bca.gov.sg/greenmark/others/sg_green_buildings_tropics.pdf
https://www.bca.gov.sg/newsroom/others/SUDW_Media_Release_260716.pdf



TREND 3

Housing availability and affordability

As the world's population grows, housing, especially in urban areas, is becoming highly competitive and less affordable. Increasing demand coupled with limited supply of quality housing is forcing prices up. And, the demand for housing is resulting in intensification of available space requiring an innovative approach to construction. Contributing to this trend is a swell of demand

for new, quality housing from all demographic groups. For example, baby boomers are moving out of traditional family homes seeking smaller, easier to maintain houses. In the US, millennials are being priced out of an insanely expensive housing market¹ which is seeing the creation of more compact, livable communities in less-dense areas outside of larger urban centres.

Housing affordability is a supply and demand issue.

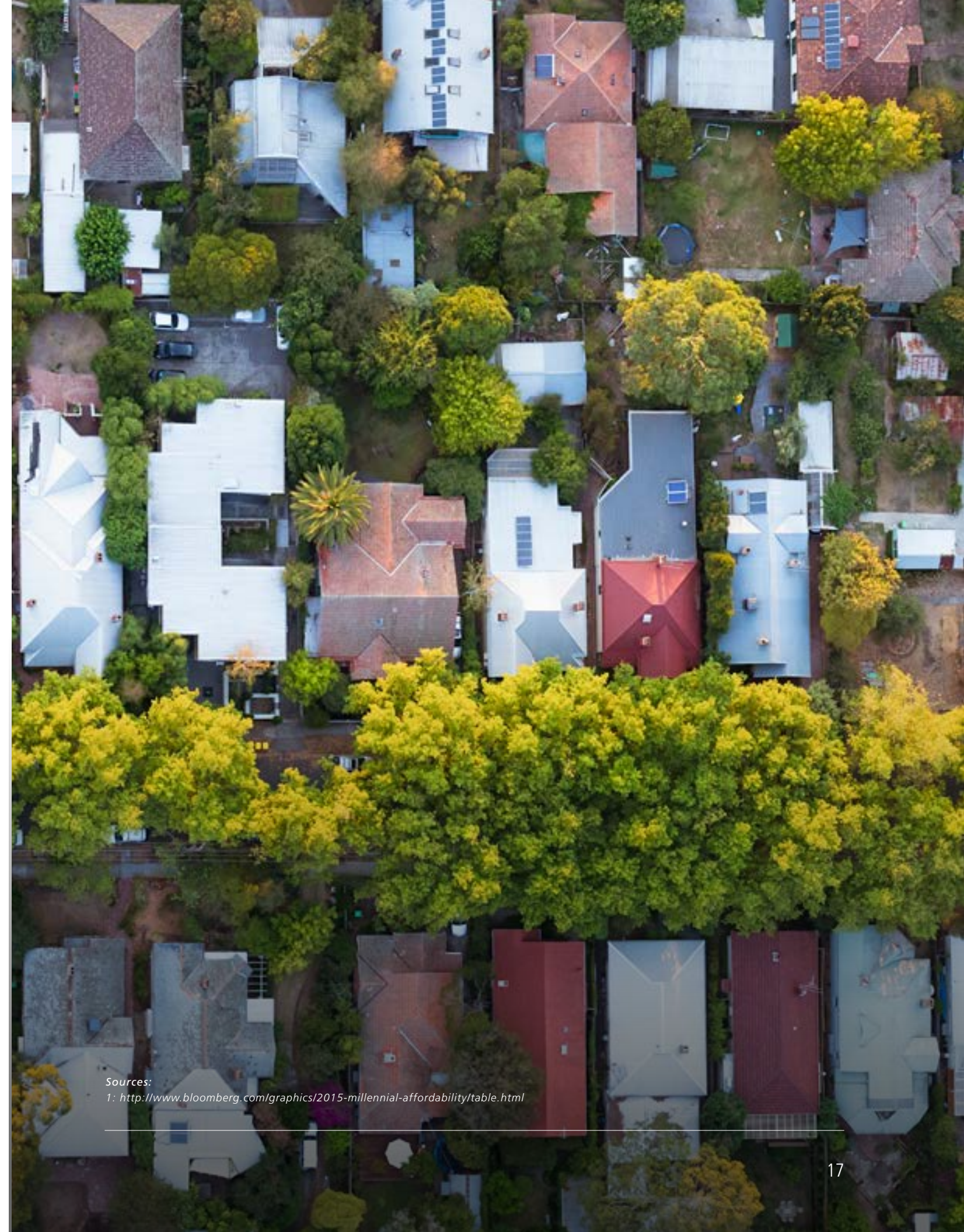
Traditional construction methods cannot deliver the speed, flexibility of design and quality of buildings needed to solve this issue. Solving this issue requires a new approach to construction that solutions like CFS can provide – as an example, for the same total building footprint you can gain more internal space per square meter.

CFS construction methods help to solve issues around global housing availability and affordability through faster build

times, reduced labour costs and less waste, drastically lowering the overall cost of construction.

The trend of using 3D and BIM Design collaboration plus high precision industrial manufacturing processes results in both high quality accurate building structures as well as the ability to bring in sub-assemblies (doors, windows, bathrooms, kitchens) which can be designed in the frame to fit precisely.

CFS construction; faster build times provide capacity for more supply.



Sources:

1: <http://www.bloomberg.com/graphics/2015-millennial-affordability/table.html>



TREND 4

Environmental events are impacting building design & material selection

Natural disasters (such as earthquakes) and climatic warning events (such as floods and cyclones) are forcing many governments and communities to rethink their policies on building methods and standards, introducing new and more modern regulations that have construction businesses, engineers and developers looking for alternative methods of construction and materials¹. Due to its very high strength to weight

ratio steel framed structures behave better than traditional materials in an earthquake. CFS is strong and at the same time lightweight, so frames flex without breaking during an earthquake and absorb lateral movement without compromising the structural integrity of the building. Testing shows steel framing withstands earthquakes up to Force 9.

CFS construction is more earthquake resistant than other methods.

CFS building systems also provide a faster, more efficient solution to building temperature control. With an increase in extreme temperature fluctuations being experienced around the globe, traditional building methods, which rely on the natural, gradual heating and cooling properties of thermal mass, simply do not perform adequately. A more efficient approach is

building systems like CFS that make use of 'cavity assembly' methods using a combination of optimized materials to achieve better, more adaptable temperature control. Well designed steel framed structures can achieve up to 300% energy savings compared to traditional methods.

Sources:

1: <http://webcache.googleusercontent.com/search?q=cache:0TqcuHx-HpYJ:www.hnzc.co.nz/assets/Uploads/Future-Scenarios-for-Social-and-Affordable-Housing.pdf+&cd=1&hl=en&ct=clnk&gl=nz&client=safari>



High wind resistance is another advantage of CFS over traditional building materials. The US Navy has found that by using CFS they could construct buildings which could withstand close to 200 mph

winds, making it an ideal material for their humanitarian efforts which is often done in areas that experience extreme weather conditions such as cyclones.

CFS sub-assemblies provide high thermal, fire and acoustic values.



TREND 5

Political and economic influences

In all developing economies there is a very strong desire for people to improve their well being. This has seen a fast expanding 'middle class' in most economies with a surge in demand for quality housing, schools, health centres as well as community infrastructures. Also people are living longer creating

unprecedented demand to cater for more elderly people. Traditional building methods do not satisfy the speed of construction needed to meet demand. This problem is further compounded by a shortage of skilled tradespeople or "artisans" required for traditional methods.

CFS allows building intensification which is uneconomic with other construction methods.

This is where solutions such as steel framed construction are providing the innovation required to help satisfy demand in developing countries. This is achieved by providing a rapidly scalable precision process such as a CFS construction method which can be up to 300% faster than traditional methods. Through this industrialized process, structures can be made using lower skilled labour to put together precision manufactured components. Also, a lot of wet trades and waste are eliminated. Coupled with rapid urbanization, as

described earlier in this section, there is an intensification of construction in urban areas. Traditional building methods do not satisfy the speed of construction needed to meet demand or maximise the use of limited available building footprints. This is where solutions such as CFS construction are gaining ground and providing the innovation required to help satisfy demand in developing countries.

CFS construction requires less skilled labour on site which means less cost.

Political influences on construction methods are not only limited to developing countries. In the United States, and New York City in particular, non-traditional construction methods are proving popular with developers and builders looking to sidestep the union stronghold of on-site labour. Modern methods such as CFS, where a significant portion of the construction

expertise moves upstream to the design phase and a significant value of construction can be prefabricated offsite, means more unskilled and/or non-union labour can be employed, significantly reducing the overall cost of a project. Non-union construction is proving to be 20 to 25 percent cheaper than union labour¹.

1: http://therealdeal.com/issues_articles/are-unions-losing-their-grip-in-nyc/



Better building in a crowded city.

In the 1970s, union members had a monopoly on New York City's skyline. At the time, card-carrying union workers made up a stunning 90% of the city's construction workforce.¹ Today, New York, like many of the world's cities, is facing major housing and spatial issues. More than 20,000 affordable housing units were built during the city's 2015 fiscal year, the highest single-year gain in 25 years.

That quantity of apartments could house 50,000 New Yorkers, according to the mayor's office, which aims to create 200,000 homes for financially struggling city residents over the next 10 years.²

Modular construction, utilising CFS as a building material, is being used to create micro apartments, which are small by typical apartment standards – between 82 and 160 meters – they are designed to optimize space and maximise the sense of openness.

But crucially, these micro apartments can be prefabricated at off-site indoor facilities and transported to be erected on-site.

CFS and modular construction as a method of rapid construction is

praised by the recently retired city's mayor, Michael Bloomberg, as it is "faster, less expensive and allows for high levels of quality control and significantly reduces waste and truck traffic. It's also safer for workers as construction is done inside in controlled environments."³

This trend is threatening the stronghold that unions have traditionally held on construction labour.

In the past, the appeal of union labour has boiled down to standardisation: When developers use union labour they believe they're getting well-organized, quality work, trusting it brings training, experience, and safety to a job.

Latest statistics estimate the non-union market share at 40% and some say it may be as high as 50%.

With New York City's continuing construction boom, sources are saying that non-union contractors have gained a firm footing, particularly in residential construction projects of 20-to-25-story's.

Keep up to date with the trends in global construction.



Sources:

1: http://therealdeal.com/issues_articles/are-unions-losing-their-grip-in-nyc/

2: <http://www.constructiondive.com/news/nyc-mayor-boasts-addition-of-20000-affordable-housing-units/402314/>

3: http://www.modular.org/HtmlPage.aspx?name=NYC_MC_Housing_Needs_MA

6 Reasons why CFS is a superior construction method for the future

The future of construction lies in sustainable materials that are delivered using fast, modern methods such as a proven CFS solution available in the market.

Advanced CFS construction methods such as the Millennium Green international System can result in faster build times, lower overall costs, more versatile and scalable design solutions, and better building performance.

Combined with the innate characteristics of steel such as non-combustibility, termite and mould resistance and dimensional stability, CFS is a practical solution to many of the challenges outlined in the previous section.

In this section, we outline six key reasons why CFS construction methods like the Millennium Green international System are best placed to meet the demands of our future buildings.



REASON 1

Speed of construction

CFS construction is faster than traditional methods to manufacture and construct buildings.

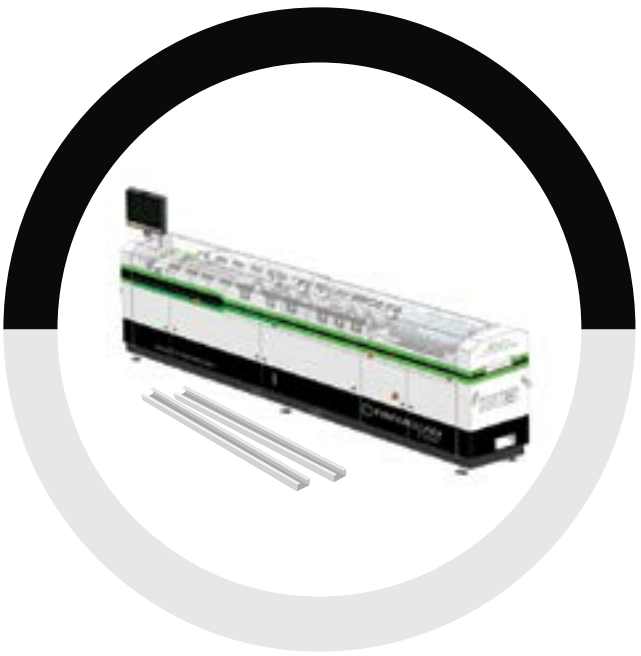


Design and specification phase:

CFS construction is a design-led process, meaning that the need for skill to construct the building is more in the design stage and less so on-site.

Systems such as the Millennium Green international System utilize world leading sophisticated design and engineering software that is incredibly accurate, reducing the need for engineer involvement during the detail design, speeding up compliance, reducing engineering cost and minimizing room for error on-site.

Millennium Green international delivers faster construction and less engineering design costs.



Manufacturing phase:

CFS frames and components are produced and fabricated from structural quality steel coils and are shaped at ambient temperatures by roll-forming machines.

They can be produced in large quantities and at high speed with consistent quality and precision.

The wide range of advanced tooling functions provided by systems like the Millennium Green international System allow high productivity and versatile output to produce roof trusses, wall frames, and floor joists — all to exact measurements, saving time and costly wastage in the construction stage. Detailed design speeds up compliance, reduces engineering cost and minimizes room for error on-site.

Millennium Green international manufacturing equipment is highly accurate, versatile with high output.



Construction (erection) phase:

CFS fabricators supply frames pre-assembled, strong and straight, and clearly identifiable. No on-site, welding or cutting is normally required. This means that the erection process is fast and simple – requiring less labour time on-site and heavy lifting equipment.

Steel frames do not absorb moisture so there is no delay waiting for frames to dry. This means minimised weather delays for rain, snow, or excessive heat for example.

CFS construction can offer a much more predictable construction schedule and less on-site cost than traditional construction methods. For example, as the material is lightweight, no heavy lifting equipment is needed on-site, frames, trusses and joists can typically be carried into place by on-site labour.

Frames are made to precise dimensions meaning pre-made windows, doors and bathrooms will fit perfectly and quickly reducing engineering cost and minimizing room for error on-site.

**Millennium Green international system
requires no welding or riveting in
assembly.**



Shorter construction times reduce the hard costs of a project. Buildings using CFS are able to go up much faster than traditional heavy materials like concrete and masonry. The schedule of a mid-rise project can be reduced by 3 months or more.

How the CFS design-led process works



REASON 2

Reduced need for highly skilled labor

The rise in popularity of CFS construction can be attributed in part to its ease of construction. Lightweight designs, 'pre-fabricated' frames, uniform quality, and quick and simple erection on-site using basic tools – all these factors reduce the need for highly skilled labor.





***Millennium Green international buildings
can be assembled using common tools
and local labor.***

Using less skilled labor for shorter periods of time on-site has obvious bottom-line benefits.

But importantly CFS enables construction in challenging locations or in areas where access to skilled labor is limited – creating jobs and opening up more opportunities for developers and builders.

And for this reason, CFS provides an attractive business proposition for trades looking to diversify their businesses.

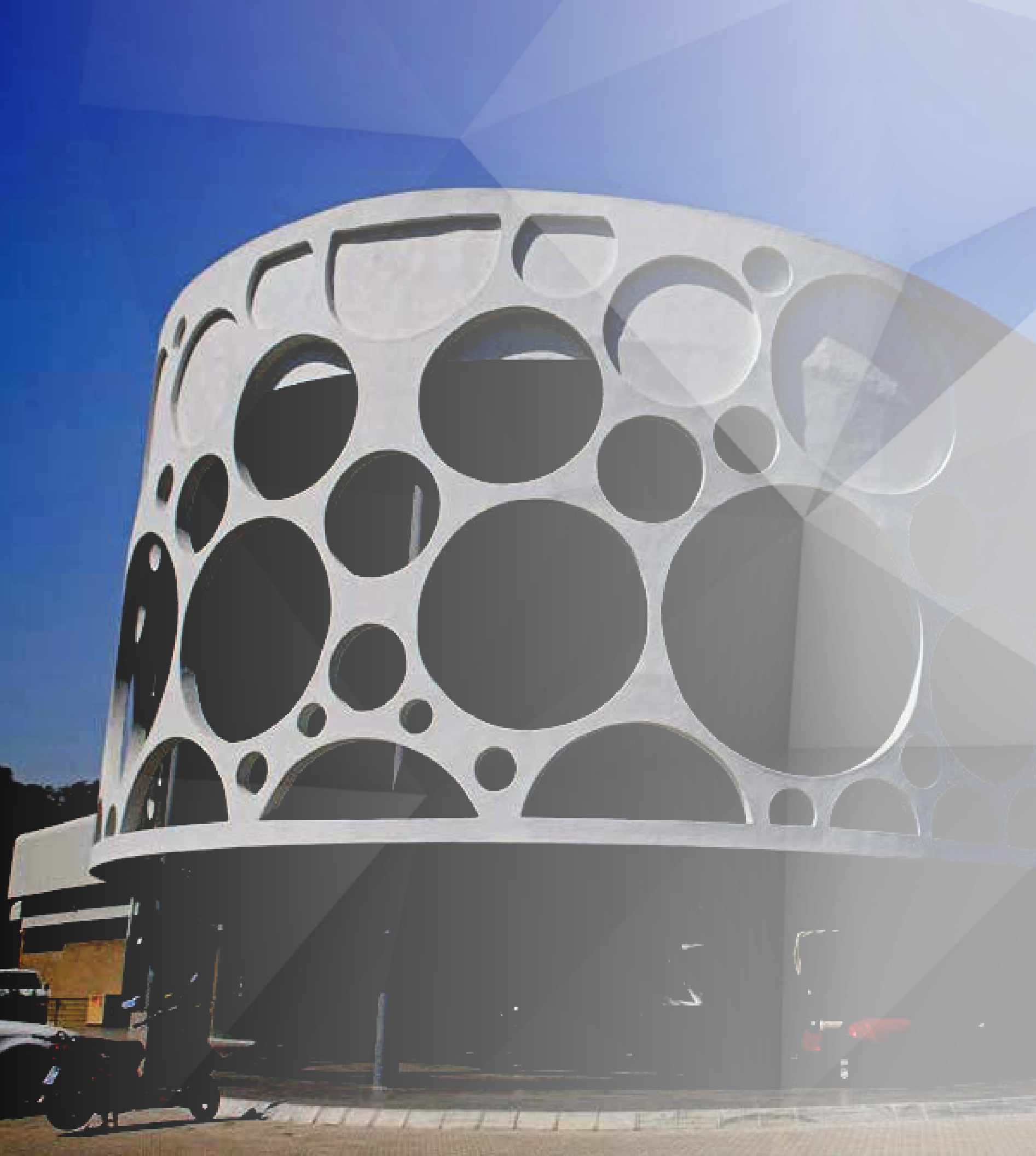
Experienced trades people find it very easy to transition to CFS framing, and with assistance and training, traditional trades who understand the fundamentals of building construction can adapt to CFS very quickly.

Assembly drawings and information can easily be shared with tradespeople on the job site via a smart phone or tablet.

The Millennium Green international System is a design led process that shifts the skill of the construction process upstream, with emphasis on the design phase.

Extremely accurate design software enables the automation of engineering calculations and status reports, speeding up the specification process, changing the quality of output and reducing the need for skilled labor on-site.

All this adds up to a faster, better quality construction process.



REASON 3

Versatility of design

The strength and ductility of CFS makes it an ideal building material for all building types — from modular and pre-fabricated units, to multi-story hotels, hospitals, schools as well as stand-alone multi-story housing.

CFS is suited to many types of building designs and applications including architecturally challenging ones.

CFS offers larger span lengths due to less weight of structure, and increased space utilization, making it possible to produce some architectural designs not possible with traditional methods, including the creation of innovative building shapes and non-conventional roof lines.

With one of the highest strength-to-weight ratios of all construction materials, CFS delivers excellent spanning capability and makes CFS perfect for creating wide, open spaces.

*Many building designs and applications
can be constructed with CFS.*

Steel framing allows for narrower walls than typically achieved with traditional materials, offering more internal space for the same total footprint, which is highly advantageous for addressing urban density demands.

And because CFS is also lightweight and easy to transport, it is also an ideal design solution for sloping or difficult sites which might otherwise require significant foundation works or on site logistics.



REASON 4

Faster return of investment

Return on investment (ROI) is obviously a critical aspect of the financial analysis of any property development opportunity. When a property can be acquired and developed in a short period of time the return on investment is realized faster and the response to satisfy immediate market demand is greater.



Designing and building with CFS can lower both construction delays and long term building ownership costs contributing to both immediate and long term ROI of building ownership in the following ways:

- CFS construction is cost competitive compared to traditional methods and, depending on the building design, can be cheaper when evaluating the overall build and ownership cost due to its advantages in speed of construction, accuracy and reduced labour costs.
- With CFS construction, logistics can be simplified; Using compact steel coils compared to the bulk and weight of transporting traditional materials, especially in dense urban environments or to remote locations.

Cost competitiveness, less waste, and faster build times means better ROI.

- There is also less waste — with traditional methods, material wastage can be up to 20%, meaning that for every 5 buildings constructed, one is wasted. With CFS, waste is virtually non-existent. A Millennium Green international System produces less than 1% material wastage.
- Structural grade steel is consistent - it doesn't have a weak direction or grain and is not reliant on water-cement ratios for strength. Therefore, high consistency means common building delays that erode developer profits are dramatically reduced.

- CFS is strong while also being light, so it can be assembled easily without the need for heavy lifting equipment and no specific tools except a screw gun — saving on time, labor and cost.
- Discounts on builder's risk insurance for steel framed structures can also result in significant cost savings.

CFS whole-of-life building-benefits provide greater owner returns.

- Long-term building maintenance costs are reduced as steel is stable, resistant to rot, mold, termite and insect infestation.
- CFS construction is also highly scalable, which means it is an ideal solution for mass production and repeatable designs. This scalability provides a much needed answer to areas in which there is a huge shortage in affordable, quality housing and community buildings, specifically in developing countries.



REASON 5

**CFS construction
creates less
waste & is
environmentally,
a better building
choice.**

Material waste in construction is a significant issue from both an ROI and an environmental perspective.

With CFS structures, waste is minimal due to accurate design and manufacture, reducing the environmental impact from waste going to landfill.

In the case of the Millennium Green international System, waste is less than 1% from frame and truss manufacture and fabrication.

And steel is 100% recyclable, reducing the overall environmental impact of any waste created.

CFS produces less waste, uses less scarce resource in construction, and delivers better energy efficiency than traditional methods.

Steel framing scrap is a valuable commodity – in fact the overall recycling rate of the steel industry is 66%, the highest of any industry in the world.

CFS is a ‘dry’ system, which means there is no need to use limited water resources for mixing cement or other materials.

This is a major consideration for those constructing in areas where access to water is an issue and where skilled ‘wet’ tradesmen are rare.

Further, sub-assemblies combining insulation, internal and external materials provide high acoustic and thermal values contributing to delivering warm buildings, resulting in much more energy efficient buildings.

With traditional methods, it is common for builders to factor in up to 20% material wastage in the total cost of a project. Adding this up over consecutive projects, wastage can be equivalent to as much as one building out of every five buildings constructed.



REASON 6

Lends itself to off-site construction

World-wide there is an increasing trend towards off-site and modular construction as landowners, developers, engineers and architects look for sound ways to improve the commercial viability of projects.

Traditional building methods are typically susceptible to adverse weather or site limitations. But with off-site modular construction, the majority of the construction process can occur in a controlled environment that is not subject to environmental or weather conditions ensuring greater efficiency and quality as a part of an industrialized process.



CFS is an ideal solution for modular off-site construction for the following reasons:

- Construction in areas with high wind speeds and/or seismic activity, salt-spray zones and other difficult environmental locations make traditional methods of construction difficult, uneconomic or unsustainable. The innate characteristics of CFS and construction methods such as the Millennium Green international System mean offsite construction is ideally suited to these locations opening up more development opportunities.
- Projects on confined sites with restricted access are increasingly turning to modular solutions to ease site construction constraints and tight time frames. For example, time dedicated to 'wet' trades including cement and plaster can be reduced.
- Constructing in a regional or remote location often means increased labour charges, material supply elongation and sometimes quality issues. However, CFS prefabrication significantly reduces this cost and risk as modular solutions are transported directly to site and require minimal labour for on-site erection.
- The quality of construction is much higher when modular prefabrication is carried out in a controlled factory environment, compared to on-site methods.
- Time consuming building areas such as facades, bathrooms and kitchens can be completely produced off-site bringing project timelines forward, reducing both congestion and wastage onsite.

The unique selling point of prefabrication and modular building construction is predicted to grow at a compounding average growth rate of 6.50% between 2015 and 2020 totalling USD209 billion by the end of the decade.

Explore the benefits of the Millennium Green international System and learn more about the advantages of CFS for your next project





Why CFS Millennium Green international buildings are better



Better quality buildings

Buildings constructed in CFS are stronger, straighter and more stable than traditional materials:

- Steel framing is straight, stable and delivers dimensional accuracy, enabling consistently straight walls, square corners and an overall superior finish. This exactness helps follow-on trades fit internal linings, doors, kitchens and other cupboards.
- The stability of steel means no contraction or expansion with moisture changes, so frames won't bend, warp, twist or shrink. Building owners will enjoy straight walls, square corners and smooth-flush surfaces for the entire life of the building.
- Cladding and linings properly installed will not budge, crack, pop or break as they might with timber frame construction as the timber moves.
- As steel is an inorganic material, it is not affected by pests such as termites, ants and wood boring beetles, which are notoriously problematic for timber framed structures.



Healthier, more sustainable buildings.

CFS buildings are healthier, more energy efficient and enable more sustainable living for the life of the building:

- CFS sub-assemblies can be constructed with high R-value materials, which relate to higher levels of thermal insulation. When constructed using best practices, CFS-framed houses have the ability to stay warmer in cold environments and cooler in high temperature locations.
- Steel does not contain additional preservative chemicals and won't give off gases or emit volatile organic compounds.
- Steel doesn't support mold growth or rot – listed as one of the top 10 home pollutants connected to heart and lung disease and shortened life expectancy.





The ideal material to build with in seismic zones.

CFS's high strength to weight ratio and non-combustibility means that it behaves better than traditional materials in earthquakes and fires making it the ideal material for seismic zones.

- Steel absorbs energy. Unlike concrete and masonry, ductile steel is able to be bent without breaking. It's ability to absorb earthquake energy and dissipate its force makes it perfect for construction in earthquake areas.
- During an earthquake, heavier structures are usually effected more by the shaking than lighter structures. Steel is much lighter and more resilient than traditional construction materials.
- Steel is consistently strong and reliable. Unlike other materials it doesn't have a direction where it is weaker nor is it dependent on water-cement ratios to give it strength.
- Framacad CFS sections are very securely connected, using screws. Steel framing has a predictably consistent load path. Unlike other materials steel doesn't contain corrosive chemicals or moisture that can damage connectors or fasteners.
- Steel is a non-combustible, fire resistant material that will not feed a fire. On average, wood structural members or framing rank third as the first-ignited material in home fires according to the (U.S) National Fire Protection Association.¹

CHAPTER 3

What to look for in a CFS partner

Whether you're considering CFS Systems for a specific project or considering establishing a CFS manufacturing or construction business, getting support from the right partner is key. There are many machine manufacturers who will sell you roll-forming machines, but to get all the benefits of CFS construction highlighted in this guide, choosing a partner who provides an end-to-end CFS System with advanced technology is key. Read on to find out what differentiates a good CFS partner from a machine seller.

Look for a partner who leads by design

Look for a partner who applies an integrated, design-led building model, merging the design, engineering, manufacturing and construction process into one efficient, effective and innovative system.

Efficient value engineering is a key success factor required to be profitable in the cold formed steel construction industry.

Using the intelligence integrated into the Millennium Green international System with real time engineering is a critical success factor that most machinery makers fail to provide.

Many CFS providers can deliver steel frames to site, but few can rival the

to design capability, engineering data and performance that the Millennium Green international System can offer. The Millennium Green international System is a design led process that shifts the skill of the construction process upstream, with emphasis on the design and engineering.

Extremely accurate design software enables the automation of engineering calculations and status reports for most building codes, speeding up the specification process, and improving both quality and economics of output.

All this adds up to a faster, better quality construction process and lower cost engineering inputs.

The Millennium Green international System is the only industry cold form steel system that combines both engineering and design software in one easy to use package.

Millennium Green international Software is developed to ensure fast and efficient design that can output fully-engineered designs

save costs in compliance and rework. Most other CFS software packages have very limited or no engineering capability and will require detailed analysis from an engineer. But with Millennium, designers can either import the design file into Millennium Structure or draft the design

in the software and complete the engineering calculations in the software. Millennium Green international Software has the major CFS building codes integrated to the software for most markets worldwide.

So no matter where you live in the world, you can have certainty that the design can be

done in accordance to code and with leading CFS calculation techniques. Millennium Green international is committed to ongoing localization with design software in 8 languages and more being added.



Look for a technology that enables rapid production of a wide variety of components and buildings

The wide range of advanced manufacturing functions provided by systems like the Millennium Green international System allow industry leading high productivity and versatile output to produce wall frames, roof trusses and floor joists – all to exact measurements, saving time and costly wastage in production and erection.

Millennium Green international provides industry leading combination of speed and precision. With the Millennium Green international System, production lines pre-cut, form, punch, number and label frames and parts “like an erector set” which means no welding, cutting or riveting is needed on-site, making it very easy to assemble with common tools and unskilled labor.

A typical automated rolling machine, such as a Millennium Green international machine, running at optimized conditions can produce frames at 2,296LinFt/hour with a topline speed in excess of 9,020LinFt/hour.



Look for a partner who can provide a complete business solution - not just a roll forming machine.

There are plenty of companies who can sell you a steel roll forming machine, but designing, engineering and building with CFS in most instances, requires a complete change to the way you approach construction projects.

You need an integrated end-to-end process from design through to manufacturing.

Traditional methods and traditional thinking no longer apply. To truly scale a CFS business you need a partner who is invested in your success through the provision of business tools that provide real time information about the performance of your roll forming system, allowing better and faster business decisions to enable business scalability.

Invest in an integrated end to end process from design to manufacturing.

Millennium Green international offers customers a unique business intelligence and support system through their MyMillennium Green international customer portal. MyMillennium Green international gives online access to real time production information from your factory, 24/7 technical

support, design and engineering tools and marketing resources to ensure you minimise downtime, increase visibility of productivity, and have accurate productivity monitoring and reporting.

Learn more about the Millennium Green international Advantage



Summary

The speed of change in the world demands a new approach to construction.

Population growth and changing environmental, political and social attitudes towards construction methods are causing many landowners, developers and builders to move away from traditional building methods and look towards modern methods of construction such as CFS to meet these new demands.

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Traditional methods of construction simply cannot compare with the numerous benefits of CFS as a construction material — speed of construction, value for money, versatility of design, ease of specification and reduced need for highly skilled labor are notable advantages. CFS material also has the ability to lend itself to off-site and modular construction, ideal for areas where traditional construction methods are impractical or too costly.

But to realise the full benefits of CFS construction, it's important to select a CFS partner who can provide both design and engineering capability, a wide range of tooling functions and 24/7 business intelligence support to provide a scalable, end-to-end CFS solution that enables faster decision making and quality of construction.

We hope this guide has helped you understand the benefits of CFS construction.

If you're considering constructing your next project in CFS or are interested in establishing a CFS business, we'd be happy to offer you a consultation with one of our CFS experts.



Please note that the information provided in this guide is of a general nature and should not be construed, or relied on as suitable for your specific situation.

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