

# Metal Builder

RURAL BUILDER SPECIAL PROJECTS

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WINTER 2025



**CASE STUDY**  
**QUICK BUILD**  
**& ON BUDGET**

## SELLING METAL AS THE SOLUTION

**UNDERSTANDING  
AIR LEAKAGE  
TESTING**

**GUIDANCE FOR  
INSULATING  
STEEL BUILDINGS**



# The New Face of Framing Efficiency

For centuries, wood was the backbone of American construction — from Native American longhouses to colonial timber homes. Wood was familiar, plentiful, and easy to use. Steel, once reserved for industrial buildings and city skyscrapers, simply didn't fit the residential mold. But times, and tools, change.

As you may already know, metal framing is stepping into the spotlight as builders and homeowners alike recognize its practical advantages. As Tom Reed of Howick Ltd. points out, a pre-fabricated metal frame for a 2,500-square-foot home can go up in just a day or two — a huge time saver for both builder and client. Metal's strength and precision bring additional benefits: no twisting, cracking, or termite damage, and far less risk of losses from fire or flood.

Builders and contractors are finding that these efficiencies translate into fewer warranty issues and happier customers. And while cost remains a common question, the price gap between wood and steel continues to narrow — especially when labor savings and reduced maintenance are factored in.

Of course, education remains key. As Sean Jones of Elite Build Company notes, transparency builds trust. When contractors present metal framing as a practical, proven option (focusing on the benefits) rather than a hard sell, customers listen.



Photo courtesy of Howick Ltd. Learn more beginning on page 8.

Metal may have once been seen as industrial or impersonal, but with today's design flexibility and clear performance advantages, it's reshaping what "home" can look like — and how efficiently it can be built.

— Karen Knapstein

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On the cover: Shed framed in metal. Courtesy of Howick Ltd.



Worn storage facility unit on left. Renew-Rite refreshed unit on right.

## TRAC-RITE LAUNCHES TURNKEY “RENEW-RITE” SELF-STORAGE RENOVATION

Trac-Rite has announced the launch of Renew-Rite, a new product and service line created in partnership with Accent Building Restoration, Inc. (ABR). This collaboration brings self-storage owners and operators a turnkey solution to repair, modernize, and revitalize aging and damaged facilities — combining Trac-Rite’s industry-leading roll-up doors, hallway systems, and metal fabrication capabilities with ABR’s expert renovation services in all 50 states.

Renew-Rite is designed to help owners refresh their facilities with best-in-class, 100% American-made roll-up doors and metal building components — including jambs, headers, and other commonly replaced components — while also enhancing unit size, layout efficiency, and overall curb appeal. The program offers more than just doors; it’s a full-service solution to revitalize your self-storage property.

“This partnership with ABR brings together two companies that share a dedication to quality and service,” said Kellen Anderson, Director of Sales for Trac-Rite. “Renew-Rite gives facility owners a streamlined way to replace outdated or damaged doors, improve security, and maximize their rentable space, and increase rental income — all backed by our reliable, 100% American-made products

and ABR’s trusted installation team.”

Built with strength, longevity, and style in mind, Trac-Rite doors are manufactured from durable American steel and backed by an industry-leading warranty. As a 100% employee-owned company, Trac-Rite is proud to work alongside ABR to deliver long-lasting solutions that protect and elevate self-storage owners’ investments.

“Having a trusted, proven door manufacturer like Trac-Rite as our partner means we can confidently deliver exceptional results to our clients,” said Jon Fawcett, President at ABR. “Together, we’re offering a full-service solution that doesn’t just improve appearance, it adds long-term value and operational efficiency to every property.”

[www.tracrite.com](http://www.tracrite.com)

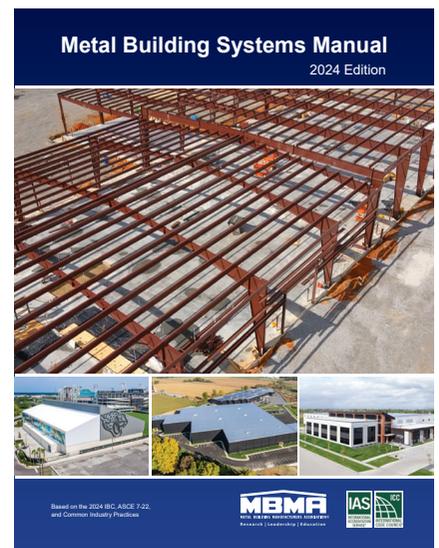
## 2024 METAL BUILDING SYSTEMS MANUAL

The Metal Building Manufacturers Association (MBMA) announces the release of the 2024 edition of the MBMA Metal Building Systems Manual. First published in 1959, this internationally recognized reference manual is a primary resource for the metal building industry and is being published in partnership with the International Accreditation Service (IAS) and International Code Council (ICC).

“For more than 65 years, the Metal Building Systems Manual has been the

go-to resource in the metal building industry,” noted Lee Shoemaker, Ph.D., PE, MBMA director of research and engineering. “This edition brings it up to date with the latest codes and provides even more examples and drawings to reference. With these revisions, it continues to be a must-have asset for those in our industry.”

The 2024 edition of the MBMA Metal Building Systems Manual brings the publication into conformance with the 2024 Edition of the International Building Code and ASCE 7-22 Metal Building Systems Manual. It also spells out common industry practices relating to the design, manufacture, sale, and erection of metal building systems (including contract, order documents and engineer of record).



A number of other important updates have been made to the manual, including but not limited to:

All the example problems for wind and snow have been expanded and enhanced to highlight the changes in ASCE 7-22, including tornado load examples.

New appendices have been included for the following:

- Large Doors
- Bulk Grain Loads
- Steel Thickness – Inch vs. Gauge
- Hail

[MBMAManual.com](http://MBMAManual.com)

## METAL PANELS INC. EXPANDS OPERATIONS WITH MOVE TO LARGER TULSA FACILITY

Metal Panels Inc. (MPI), a manufacturer of metal panels, trim, decking, and accessories, has announced its relocation to a newly constructed, 181,000 square foot manufacturing facility in Tulsa. This move represents a milestone in the company's growth strategy, significantly expanding its production capabilities while reinforcing its commitment to customer service and innovation.

Located just 1.5 miles north of its former site, the new facility brings all manufacturing operations under one roof, optimizing workflow, boosting efficiency, and improving inventory management. The expanded footprint allows MPI to streamline workflows, introduce new product lines, and enhance service delivery across its regional and national customer base.

"After years of planning, we're excited to offer the next generation of metal panel manufacturing to our new and loyal customers," said Mitchell Hentkowski, President of MPI. "This move is more than just an expansion — it's an investment in our customers. The additional space and well-designed layout will allow us to optimize production, reduce lead times, and deliver innovative new solutions for contractors and builders."

The advanced facility features two-lane customer pickup bays, roll formers capable of producing 23 profiles, automated bending brakes for custom trim, and three profile deck lines and a purlin line. These enhancements will support higher production volumes, consistent product quality, and faster turnaround times.

MPI's carefully planned, phased relocation ensured minimal service interruption for customers throughout the transition. The company now looks forward to leveraging its upgraded operations to better serve clients across the metal building, post-frame, storage, and residential construction sectors.

## SASHA DEMYAN ELECTED TO METAL CONSTRUCTION HALL OF FAME

The Metal Building Contractors and Erectors Association (MBCEA) has announced that Sasha Demyan, MBCEA Executive Director, has been elected to the Metal Construction Hall of Fame.

"Sasha's unwavering commitment to our members and her straight-up get-it-done passion, along with the steadfast coordination of many association presidents, made her an all-in, unanimous inductee for the Hall of Fame," said Robert Tiffin, MBCEA President. "Congratulations Sasha — the gold, nay diamond, standard for our industry."



**Sasha Demyan, newly elected member of the Metal Construction Hall of Fame.**

The Metal Construction Hall of Fame honors people in the industry who have made significant contributions to the metal building industry and improved people's lives. Demyan took over the MBCEA in 2012 and immediately set about revitalizing the organization. Since then, the organization has grown more than 250% to over 700 members today. At the same time there has been a substantial increase in participation at the annual conference, which has become a must-attend event for anyone in the metal construction industry.

Demyan was instrumental in co-locating the conference with the Metal Building Manufacturers Association (MBMA) Spring Meeting, bringing together contractors, erectors and manufacturers to better understand each other's needs and concerns and help grow the industry. She has also prioritized the

development and delivery of meaningful programs focused on safety, training, and quality such as promoting the International Accreditation Service (IAS) AC478 Accreditation for Metal Building Assemblers Inspection initiative.

"It is an honor to be enshrined with the many people who helped me along the way," says Demyan. "So many of the inductees have served as mentors to me throughout my career. To be listed alongside them is truly gratifying and a testament to the confidence they have in me and our efforts to make the MBCEA the premier association for contractors and erectors."

## MBMA ANNOUNCES 2024 SAFETY AWARD WINNERS

Each year the Metal Building Manufacturers Association (MBMA) honors member companies that demonstrate exceptional performance in maintaining workplace safety. These awards are given to Building Systems members as well as Associate members for their performance during the previous calendar year. Safety awards for the 2024 year were presented during the 2025 MBMA Spring Meeting held May 7-9 in Charlotte, North Carolina.

"The MBMA Safety Award program was initiated in 2011," noted Tony Bouquot, MBMA general manager. "Since then, we have presented more than 400 awards to both Building Systems members as well as Associate members. We are proud to honor those members who have exceptional safety records as we strive to make the industry a safe place for everyone."

In 2024, Building Systems members had 45 plant facilities that participated in MBMA's OSHA Injury Statistics Program. "Effective safety initiatives have many benefits," added Bouquot, "including boosting employee morale, improving operations, and mitigating insurance risks and exposure to OSHA audits.

MBMA's awards program consists of three categories. The 2024 Superior Safety



**Tony Bouquot, right, MBMA general manager, and Tim Logue, Safety Committee chair, present the 2024 MBMA Safety Awards at the 2025 Spring Meeting held in Charlotte, North Carolina.**

Award was presented to five plants that achieved zero recordable cases for the entire calendar year, which is a significant accomplishment. The 12 facilities that received the 2024 Safety Performance Award achieved an incident rate equal to 50% or less than the OSHA industry average. The 2024 Associate Member Superior Safety Award went to 54 facilities that achieved zero recordable cases for the year, also a major achievement.

The following is a comprehensive list of 2024 MBMA safety award winners:

**2024 Superior Safety Award:** In recognition of Building Systems member manufacturing facilities with zero recordable incidents.

- Cornerstone Building Brands (Atwater, CA)
- Nucor Buildings Group (La Crosse, VA; Lathrop, CA)
- Package Steel Systems (Sutton, MA)
- Dean Steel Buildings (Thomasville, GA)

**2024 Safety Performance Award:** In recognition of Building Systems member manufacturing facilities having achieved an incident rate equal to 50% or less than the industry average as reported by OSHA.

- Behlen Building Systems (Columbus, NE)
- Cornerstone Building Brands (Elizabethton, TN; Houston, TX; Lexington, TN)
- Kirby Building Systems, Inc. (Portland, TN)

- Nucor Buildings Group, a Nucor Company (Brigham City, UT; Swansea, SC; Terrell, TX; Waterloo, IN)
- Red Dot Buildings (Athens, TX)
- Schulte Building Systems, Inc. (Hockley, TX)
- Whirlwind Steel Buildings (Houston, TX)

**2024 Associate Member Safety Award:**

In recognition of Associate member facilities with zero recordable incidents.

- Bay Insulation Systems (Aurora, CO; Baton Rouge, LA; Brooklyn Heights, OH; Coppell, TX; East Granby, CT; Eastlake, OH; Easton, PA; Fridley, MN; Garner, NC; Green Bay, WI; High Point, NC; Houston, TX; Indianapolis, IN; Kansas City, MO; Norcross, GA; Orlando, FL; Pensacola, FL; Phoenix, AZ; Roanoke, VA (2 locations); San Marcos, TX (2 locations); St. Louis, MO; Sumner, WA)
- Global Building Products/Infinity UV (Elkhart, IN (2 locations))
- Metl-Span/Centria, A Nucor Company (Brigham City, UT; Frankfort, KY; Laurens, SC; North Las Vegas, NV; Waterloo, IN;)
- S-5! Attachment Solutions (Iowa Park, TX)
- Sherwin Williams Company (Pittsburgh, PA; Garland, TX)
- Silvercote A Service Partners Company (Ashland, VA; Byram, MS; Denver, CO; Duluth, GA; Greenville, SC; Houston, TX; Itasca, IL; Little Rock, AR; Marshfield, WI; Mooresville, NC; Portland, OR; Pottstown, PA; Salt Lake City, UT; Scotia, NY; Sioux Falls, SD (2 locations); Stockton, CA; Wright City, MO).

**CENTRAL STATES WELCOMES NEW MANUFACTURING UNIT PRESIDENT**

Central States Inc., a supplier of metal building components, roofing, and building packages, has announced Doug Watts has joined the 100% employee-owned business as Central States Manufacturing President. Watts comes to his new post with more than two decades of manufacturing and leadership

experience and will oversee operations, sales, logistics, and customer service for Central States Manufacturing.

With more than 25 years of experience in the building materials and glazing systems industries, Watts brings a wealth of leadership and operational expertise to his new role as President of Central States. Most recently, he completed a 22-year tenure at Oldcastle Building Envelope. There, he held several key leadership roles, including President of Architectural Glazing Systems, where he oversaw full P&L responsibility for business units across the U.S. and Canada. Over a three-year period, he helped grow the company's revenues by 50%.



**Doug Watts, new Manufacturing Unit President at Central States.**

His proven track record of driving growth, operational excellence, and customer-focused innovation positions him well to lead Central States into its next chapter.

"I'm honored to step into the role of President at Central States Manufacturing," Watts said. "This company's culture of integrity, innovation, and employee-ownership is truly special. I'm excited to serve alongside our incredible team of employee-owners as we continue building on our legacy of excellence. I also want to thank Tim Ruger for his outstanding leadership over the last decade. Tim's contributions have positioned us for continued success, and I look forward to building on that foundation." **MB**

# Air Leakage Testing

## Why and How It's Done

Building contractors are always looking for new and improved ways to ensure the longevity of the build and increase customer satisfaction. Air leakage testing is becoming more and more popular and is even required in some states. Metal buildings in particular can offer greater difficulty due to the difference in materials used.

Air leakage testing for metal buildings was first introduced by the International Energy Conservation Code in 2012 (*NIA's Metal Building Laminator Committee*). Since then, there have been several addenda with the most recent one being added in 2024. Overall, 35 states have adopted an edition of the IECC since 2012 (*National Association of Home Builders*). The goal is for all 50 states, as well as the District of Columbia and Puerto Rico, to adopt an edition to help increase energy efficiency, lower energy bills, extend HVAC lifespan and increase comfort and indoor air quality.

This process of air leakage testing involves three major components: incorporating a blower door, visual inspection and infrared pictures (*NIA's Metal Building Laminator Committee*). This should be done during or at the end of construction; before the building is inhabited. The testing company will come in to determine the square footage and whether or not the building can be tested as one entire unit or if it will need to be done in sections. After this, it will be decided how many fans and how much pressure will be used during testing.

An inspection of the building is also done to ensure there are no obvious areas where air leakage will occur. This usually includes HVAC runs, plumbing and drain pipes. Some sort of temporary seal will need to be placed over these openings, this needs to be a sealant that can stand up to the pressure changes that will occur



**A blower door test works by mounting a special fan in an exterior doorway to check how airtight a building is. All exterior doors and windows are closed, and interior doors are left open so air can move freely. The fan either pulls air out or pushes it in to create pressure, which helps pinpoint where air is leaking through cracks or gaps in the structure.** INGO BARTUSSEK-STOCK. ADOBE.COM

during the testing process. For example, painter's tape will not be sufficient. If everything checks out well, all interior doors will be propped open, and all exterior windows and doors will be closed and locked (*BC Housing*).

One or multiple exterior doors — depending on building size — will be selected to be used for fan placement. The door will be sealed with a special plastic sealant that has an opening for the fan. A small tube will also be run from inside the building to the outside where it will connect with a manometer to read pressure changes (*BC Housing*). Once everything is fully sealed, a certain amount of pressure will be released into the building using the fan(s), and pressure changes will be recorded.

Beyond that, thermal imaging is also used to check for any 'hot spots' during and after testing. Smoke testing can also be done which involves using a smoke machine inside the building while someone on the outside watches for any signs of leakage.

Once testing is completed, it will need to be determined if the building passed. In the 2012 edition of the IECC standards, there are three compliance options. The first is that material must have an air permeability of no greater than 0.004 cfm/sq. ft., the second is the assemblies of materials and components should not exceed 0.04 cfm/sq. ft., and the third option is the whole building air leakage test should not exceed 0.4 cfm/sq. ft.

If the air leakage testing does not

exceed these levels, the building passes the code and can be inhabited. If the building does not pass, it will need to be reassessed after appropriate corrections are made.

There are several potential problem areas in metal buildings. The first of these is dissimilar material surfaces which includes wall bases, windows and doors. Secondly, intersections or changes in air barrier configuration can pose a threat. Examples of these include wall to wall and wall corners. Lastly, penetrations such as HVAC, electrical, plumbing and canopy framing members can increase the chances of leakage (*Z-Tech Consulting LLC*). Once the areas of concern are located, some type of new sealant will need to be placed to ensure the building can pass the repeat testing. (*Z-Tech Consulting LLC*)

The Metal Building Manufacturer's Association (MBMA) website, [mbma.com](http://mbma.com), offers a multitude of educational and technical resources. One resource in particular, titled *Best Practices to Comply with Whole-Building Air Leakage Testing Requirements for Metal Building Systems*, goes into great detail on what a contractor can do to prevent easily avoidable issues with air leakage in metal buildings. This encompasses tips for all of the problem areas stated above as well as quality

control and quality assurance.

With all of that being said, there are plenty of reasons that a contractor would want to go through air leakage testing even if it is not required in their state. After all, air leakage does not only affect whether or not a building will pass code, it also will affect the pocket book of the building owner, cause issues with

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## Air leakage testing for metal buildings was first introduced by the International Energy Conservation Code in 2012.

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internal temperature and impact air quality (*Blue Green Engineering*). With unwanted air flow to the outside of the building, usually from poorly sealed windows or doors, heating and cooling appliances will have to work harder to maintain the desired temperatures and avoid unwanted temperature differences. This will shorten the lifespan of the equipment and cause the owner to spend more money on replacements. Cracks

or air leakage areas not only let air out of the building but also let allergens and dust back in, which can increase health issues and cause additional damage to the internal equipment (*Blue Green Engineering*).

It should also be noted that since 2012, roughly 67% of states have adopted some form of the International Energy Conservation Code, indicating at some point your state may be added to that list. If contractors are already meeting some version of the code, even if it is not yet required, they will be prepared for it when the time comes. Not only will this be beneficial to the contractor, but will also improve client satisfaction.

Overall, the International Code Council has projected that between the years of 2010 and 2040, with the adoption of the IECC residential and commercial buildings will save roughly \$126 billion in energy costs, 841 MMT of avoided carbon dioxide emissions, and 82 quads of primary energy (*International Council Code*). According to the ICC, these amounts equate to the emissions of 177 million passenger vehicles, 245 coal power plants or 89 million homes. Although this testing adds another step to construction, it will help save a large sum of money in the long run. **MB**

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# Selling Steel

## Metal Building Benefits and Sales Tips

Wood has been the paradigm in building in the United States for centuries. Many Native Americans made homes using wood. Then the Pilgrims of Plymouth found it to be a remarkably plentiful resource and built their homes of timber. Through the years, wood became the most common building material.

In the 1800s, innovators developed steel for industrial buildings. Some industrial and business buildings were built from steel; especially after Chicago's Great Fire, the resource was considered a great alternative to wood although it was very expensive.

People building homes found the massive supply of lumber much more cost effective. For those who had money and wanted a different look for their homes, brick and stone filled the bill because the aesthetic steel brought was too alien from the usual residential fashion.

The Industrial Revolution brought processing improvements that made steel more affordable, yet it remained the staple of industrial construction. The traditional building methods and visuals were very ingrained in the culture, and wood was considered easier and faster to work with at the time.

Innovation and styles do change things, though. Today builders are finding metal



to be an easier material to work with and people have begun incorporating industrial design into the residential aesthetic. Further, metal buildings no longer have to have an industrial feel; there are many style options.

### **BUILDER – AND CUSTOMER – BENEFITS**

Tom Reed is the Regional Manager at Howick Ltd., and he sees many benefits to metal framing.

"A pre-fabricated metal frame is easier to assemble than a wood frame. The metal framing for a 2,500 square foot house can

be completed in 1-2 days," Reed said, "so metal framing can mean a quicker build benefitting the customer and creating efficiencies for the contractor, too."

Steel frames are resilient, durable, and fire deterrent. The fire resistance of metal framing may save the customer money on their insurance. Depending on the climate in which the customer is building, fire resistance can be very important. In other climates, customers may be glad to hear that if the neighborhood is flooded, the metal frame will stand firm. The wall sheeting may need to be replaced, but the house will remain intact and mold cannot form on steel.





Another advantage that metal can claim is it is impervious to damage caused by termites and other pests. Sean Jones of Elite Build Company of Oklahoma, said that in some areas of the country, this is a huge advantage.

Other benefits? “Contractors see lower costs in warranty issues because there is no nail back-out, twisting or cracking of wood,” Reed said.

Any benefit for the customer benefits the contractor as well because it makes it easier to sell and can lead to a satisfied customer.

## TYPICAL CUSTOMER OBJECTIONS

Questions about price are often the concerns that builders have because they want to be competitive. The prospective client will want to know which is more expensive, wood or steel, so that is what the contractor wants to know as well.

The lumber and steel markets can be quite volatile, so the answer to that question varies depending on when it’s asked. Reed said that while metal may start out at the higher price, that doesn’t necessarily mean that it will be the costlier choice in the end.

“If you are using panels and pre-fabricated parts,” Reed said, “a building requires less labor. Pre-engineered components can come stamped with part numbers and drawings, so they can be quickly and easily constructed.”

If less labor is required, the contractor saves money and time that can be used elsewhere. Further, parts tend to be more

precise and in the end, there are likely to be fewer problems and warranty claims. Therefore, the building costs the contractor less and the savings should be reflected in the estimate they provide to the customer.

Even small buildings that might seem like they may not need metal framing can benefit. A wood shed’s framing that could take two hours can now be done in 20 minutes Reed said.

Another objection people use is that steel is less energy efficient because it conducts heat. For example, if steel framing butts up against metal cladding in a cold climate, you can see where the ice has melted on the outside of the house indicating the conduction going on. This can lead to condensation inside walls or attic spaces. However if cladding is installed properly with thermal breaks, there will be no problem.



## PRESENTATION

Sometimes making the sale comes down to the way the information is presented. The goal is to provide an education without being condescending. One way to go about this is to present information like you are giving them an insider’s tip. For example: “One thing that people often don’t know about metal buildings is that they may be eligible for a discount on their homeowner’s insurance due to the fire resistance of metal.”

Another way to approach education is to make the customer feel that you are embarking on a journey of discovery with them. You might say something like: “Well, I hear you saying that price is of great concern to you. Let’s compare metal framing and wood framing and see how it comes out.”

It may come out that the wood is the cheaper material, but then you explain the savings on labor, and you reinforce it with the possible savings on insurance.

Whatever approach you take, make sure that you are not exaggerating the benefits; lack of sincerity can be felt as well as verified by a closer look at the facts.

Jones said, “Be brutally honest and transparent. Be prepared to prove what you are saying.”

Proof can be established through references to information from reliable sources or testimonials, even taking them to talk to previous customers. If you are working on the commercial side, CEOs will compare notes, so having the approval to list one or two as references can help. **MB**



# Portal Framed in 12 Hours

## Smoking Joe's Honey Shed Built By Central Steel Framing

There's a rule of thumb in construction that says you can only ever have two of these three factors: a fast build, good value, and a high-quality end result.

Smoking Joe's Honey and Central Steel Framing recently worked together to break that rule. They ticked all three boxes, to create a complex, custom structure, on time and on budget.

Central Steel Framing (CSF), Howick's sister company, is based in Taupō, New Zealand. Between them, the CSF team has 60 years of experience in manufacturing and construction, so they know what makes their market tick. They use Howick machines and framing automation technology to speed up construction, reduce costs, minimise waste and create stronger, smarter built solutions.

The Howick team created X-CALIBR™,

### Project Details:

Project Size: 650sqm / 6995sqft

Year: 2025

Location: Kuratau, Taupō, New Zealand

a new roll-formed structural steel technology that can replace heavy steel construction methods, to enable faster and more cost-effective framing of large portal buildings. They used this smart system, which is currently only available in New Zealand, to deliver a fully-customised solution for Smoking Joe's Honey.

### SMOKING JOE'S HONEY COLD STORAGE SHED

Smoking Joe's Honey is a fast-growing rural business based in Kuratau, near Taupō, New Zealand. They needed a

custom, cold honey storage shed able to support a fully integrated cool store, shelving, and internal/external liners.

It was a complex project, and the client needed it done fast, with minimal site disruption. Luckily for them, that's what the CSF team does best.

### KEY INSTALLATION METRICS

- Roll-formed structural steel systems
- 650sqm (6997sqft) footprint – 18m (59ft) wide x 36m (118ft) long
- 18m (59ft) clear span
- Portal frames, rafters, columns, purlins and girts installed in just one day (approx. 12 hours)

### TECHNOLOGY AND WORKFLOW

The CSF team worked closely with Smoking Joe's to customise every inch of

the shed to meet their needs. From design to delivery, each step of the process was laser focused on speed, simplicity and strength.

Everything was prefabricated offsite, including cleats and drill holes. As a result, assembly onsite was fast, clean and accurate — there was no cutting, swarf, or grinding dust. And since the process was so quick, significant savings were made in onsite assembly costs.

This was despite the fact that the CSF team was working onsite with a construction crew that had never used the system. The X-CALIBR™ system features easy, clip-together assembly and pre-aligned connections, so the construction team found it easy to follow, fast to erect, and extremely precise.

Warren Farr, General Manager of Central Steel Framing, explains that this is all by design: “Everything that we’ve done is to minimise time onsite.”

## THE RESULTS: FAST ASSEMBLY AND A SMARTER BUILD

Thanks to the system’s ease of assembly, Smoking Joe’s shed ticked all three boxes — it was built on time, on budget and to an extremely high standard.

Wallace Steel, owner of Smoking Joe’s, was buzzing when the build finished:

“X-CALIBR™ was willing to customise it to our needs, which was going to save us



quite a lot in assembly costs. I’m amazed at how fast it went up actually.”

The end result was a durable, high-performance structure that was tailored to the needs of a fast-growing rural business (and completed within a tight timeframe, with less waste).

## YOU BUILT THAT ALREADY?

When the build was nearly finished Warren says there was very visible evidence of how good the system really is:

“Next door there was a similar shed that was started on Jan 20th and on March 12th it wasn’t even close to being ready for cladding. Ours started on Feb.

20th and by March 12th the building was nearing completion, including installation of a large cool store.”

“My favourite bit about visiting the site was hearing the builders say none of their shed building mates could believe that they didn’t have to cut or drill anything, and that it was done so fast.”

## BENEFITS DELIVERED

- Very strong, lightweight construction with strength matching that of hot-rolled steel construction but without the downsides
- Custom build delivered, without a custom price
- A high level of precision in all structures thanks to Howick technology.
- Simplicity of assembly thanks to CSF’s smart design and X-CALIBR™ technology
- Zero waste onsite
- Extremely fast build times, and minimal disruption to site
- Minimal labour required for assembly delivered significant cost savings. **MB**

*X-CALIBR™ is a New Zealand-made roll-formed structural steel framing system developed by Howick. It offers a smarter, faster alternative to traditional steel portal framing.*

*Every project is custom-designed and manufactured offsite using Howick roll-forming machinery, reducing material waste and maximising build efficiency.*





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# Preventing Heat Conduction

## Best Practices for Insulating Light-Gauge Steel Structures

Light-gauge steel framing has become a common choice in residential, commercial, and agricultural construction. Its advantages are clear: it's straight, dimensionally stable, lightweight, noncombustible, and resistant to rot, termites, and many of the problems associated with wood framing. But steel has one significant drawback when it comes to building performance—it's an excellent conductor of heat.

Because steel conducts heat far more efficiently than wood, it creates what is called thermal bridging. In simple terms, anywhere a steel member passes through the building envelope, it can carry heat

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**Proper detailing of air barriers, vapor retarders, and drainage planes is essential.**

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in or out, bypassing the insulation you installed between studs, joists, or rafters. The result is lower effective R-values, higher energy costs, and in some climates, a greater risk of condensation problems.

“When we build with steel the first thing people notice is how straight and clean the

framing is,” says Nolan Woody, Operating Partner at Curbed Construction. “The second thing they notice, usually after the first utility bill, is how fast heat transfers if insulation isn't handled right. Thermal bridging can cut the performance of a wall in half. If we don't plan for continuous insulation up front, the owner ends up paying the difference every month.”

### **WHY THERMAL BRIDGING MATTERS**

Most batt insulation, such as fiberglass or mineral wool, is designed and tested assuming it fills the space between framing members. In a steel wall with studs spaced

16 or 24 inches on center, however, those studs can reduce the effective R-value of the wall assembly by as much as 50% compared to its rated performance.

For example, an R-19 fiberglass batt installed between wood studs might perform close to its rated value. The same batt

installed in a steel stud wall may only deliver an effective R-9 or R-10 because the steel members bypass the insulation.

### THE ROLE OF CONTINUOUS INSULATION

The most effective way to deal with

thermal bridging is to add continuous insulation (CI)—a layer of insulation installed on the exterior side of the framing, running uninterrupted across studs, joists, and other members.

Common materials used for CI include:

- Rigid foam boards (polyiso, XPS, EPS)

## Code Reference: Insulation Requirements for Steel-Framed Assemblies

Source: 2021 International Energy Conservation Code (IECC) and ASHRAE Standard 90.1-2022

### Steel-Framed Wall Assemblies (Commercial Buildings)

Climate Zone	Minimum Required Insulation	Typical Assembly Example
3–4	R-13 cavity + R-5 continuous	R-13 batt between studs + 1" polyiso board exterior
5–6	R-13 cavity + R-7.5 continuous	R-13 batt + 1.5" polyiso
7–8	R-13 cavity + R-10 continuous	R-13 batt + 2" polyiso or mineral wool board

#### Code Reference:

- IECC Table C402.1.3, *Opaque Thermal Envelope Requirements by Assembly*
- ASHRAE 90.1 Table 5.5-1 through 5.5-8, *Building Envelope Requirements by Climate Zone*

### Steel-Framed Roof Assemblies

Climate Zone	Minimum Required Insulation	Example
3–4	R-25 continuous above deck	Two layers of 1.5" polyiso staggered over metal deck
5–6	R-30 continuous above deck	Two layers of 2" polyiso
7–8	R-35 continuous above deck	4" total polyiso or mineral wool board system

#### Code Reference:

- IECC Table C402.1.3 (Roof Assemblies, Metal Building Roofs)
- ASHRAE 90.1 Section 5.5.3.1.1

### Steel-Framed Floors (Over Unconditioned Spaces)

Climate Zone	Minimum Required Insulation	Example
3–4	R-19 cavity	Fiberglass batt between joists
5–8	R-30 cavity	Mineral wool batt between joists

#### Code Reference:

- IECC Table C402.1.3 (Floor Assemblies)

### Best Practice Notes

- Continuous insulation (CI) must be *uninterrupted* across all framing members.
- Thermal breaks (e.g., isolator clips, composite spacers) may be used to reduce conductive heat paths.
- Always verify regional code amendments and energy performance targets before final design. **MB**



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- Mineral wool boards (rigid or semi-rigid)
- Spray-applied insulation (closed-cell spray foam, when used as a continuous layer)

By covering the steel with an uninterrupted insulating layer, thermal bridging is significantly reduced.

“Continuous insulation isn’t just about meeting code,” Woody explains. “It pays back in comfort and durability. If you skip it, you’re basically building in a problem that will cost more over the life of the building.”

### COMBINING CAVITY AND CONTINUOUS INSULATION

Most builders use a hybrid approach: cavity insulation inside the steel framing combined with continuous insulation outside.

“On our mixed-use commercial PEMB projects, insulation and soundproofing needs vary from one space to another,” says Woody. “The climate-controlled areas are where performance really matters, while the warehouse side can be more cost-conscious. What we’ve found works best is rolled batt or spray foam insulation on the metal exterior walls, and then batt

insulation on the perimeter and interior walls of the conditioned space. That balance has proven to be both reliable and cost-effective.”

### MOISTURE AND AIR CONTROL

Because steel is such a good conductor, condensation control is crucial. Even minor air leaks can lead to moisture accumulating inside wall or roof assemblies.

“Steel is unforgiving with moisture,” Woody notes. “On one job we had a few unsealed penetrations around mechanical lines and it led to condensation inside the wall cavity. Within months fasteners were corroding. Since then we make it a point to seal every joint and transition carefully.”

Closed-cell spray foam can provide additional protection. “It adds R-value and helps seal where steel tends to sweat,” Woody explains. “I don’t treat it as the only line of defense, but in some assemblies it gives the owner peace of mind that condensation won’t become a problem.”

Proper detailing of air barriers, vapor retarders, and drainage planes is essential. Builders should ensure air barriers are continuous and penetrations are sealed, and vapor control layers are positioned according to the building’s climate zone.

### ROOF AND CEILING ASSEMBLIES

Roofs framed with light-gauge steel present similar challenges: thermal bridging and condensation.

“With steel roofs, especially low-slope systems, insulation mistakes show up quickly,” says Woody. “The approach that has worked best for us is combining above-deck insulation with batts inside the structure. That gives the right performance and keeps call-backs down.”

Above-deck insulation—rigid foam or mineral wool boards—is particularly effective at breaking thermal bridges and maintaining consistent surface temperatures across the roof deck.

### MOISTURE MANAGEMENT FROM THE GROUND UP

“Moisture control and insulation really start in the slab,” Woody adds. “Using rigid insulation and a commercial vapor barrier system helps keep moisture from escaping through the concrete and into the building.”

Moisture is the long-term threat for all steel-framed assemblies. “Drainage, flashing, and site grading are just as important as the insulation itself,” Woody says.



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“In metal buildings the base plates and window details are usually what make or break the envelope.”

### CODE COMPLIANCE

Builders should always verify their insulation strategies meet local codes. Most reference **ASHRAE 90.1** or the **International Energy Conservation Code (IECC)**, which set minimum R-values for steel-framed assemblies.

In many climate zones, a steel-framed wall might require R-13 cavity insulation plus R-5 continuous insulation to comply. Without CI, meeting these standards is nearly impossible. Energy codes continue to tighten, so planning hybrid assemblies now helps future-proof projects.

### THE BOTTOM LINE

“At the end of the day, a metal building can be every bit as comfortable and efficient as any other type of structure,” Woody concludes. “You just have to respect the physics of steel, plan for thermal bridging, manage moisture, and treat insulation as an investment instead of an afterthought.”

Light-gauge steel framing offers outstanding structural performance and durability. With proper insulation design—balancing cavity and continuous insulation, controlling air and moisture, and following code—builders can ensure these structures are energy-efficient, comfortable, and built to last. **MB**



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