Forging the Future of Metal Building Systems Through EDUCATION

2021 ANNUAL REPORT
### Contents

<table>
<thead>
<tr>
<th>Page</th>
<th>Section</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>03</td>
<td>CHAIRMAN’S MESSAGE</td>
<td>Educate Everybody! Let’s Help People Grow In Knowledge Every Day</td>
</tr>
<tr>
<td>05</td>
<td>MANAGEMENT PERSPECTIVE</td>
<td>The Roaring Twenties?</td>
</tr>
<tr>
<td>13</td>
<td>ARCHITECT COMMITTEE</td>
<td>A Young Committee, A Fresh Perspective &amp; A Challenge</td>
</tr>
<tr>
<td>07</td>
<td>MBMA 65-YEAR ANNIVERSARY</td>
<td>A Timeline of Achievements</td>
</tr>
<tr>
<td>15</td>
<td>EDUCATION COMMITTEE</td>
<td>A Very Productive Year!</td>
</tr>
<tr>
<td>09</td>
<td>MBMA VOLUNTEERS MAKE US STRONG</td>
<td>Over 500 People Help MBMA Achieve Great Goals</td>
</tr>
<tr>
<td>11</td>
<td>ACCREDITATION COMMITTEE</td>
<td>Accreditation Gives Immediate Credibility to Metal Building Industry Firms</td>
</tr>
<tr>
<td>17</td>
<td>ENERGY COMMITTEE</td>
<td>Assuring Energy Efficiency in Metal Buildings Is Our Top Priority</td>
</tr>
<tr>
<td>19</td>
<td>FIRE &amp; INSURANCE COMMITTEE</td>
<td>Research Addresses Hail and Fire Challenges</td>
</tr>
</tbody>
</table>

![Girl Scouts of Western Oklahoma Camp Trivera](image)
MARKETING COMMITTEE
Marketing Initiatives Make Knowledge Sharing a Priority

SAFETY COMMITTEE
Safety: Always Relevant, Always Essential

STATISTICS COMMITTEE
We’re All About Numbers

SUSTAINABILITY COMMITTEE
Enhancements Completed for EDP, LCI and LCA Industry Tools

TECHNICAL COMMITTEE
Technical Challenges, Resulting Solutions: MBMA Helps to Improve Codes and Standards

ANATOMY OF A METAL BUILDING SYSTEM
Metal Building Structures

EDUCATIONAL & TECHNICAL RESOURCES
Technical Manuals, Videos, Webinars, Research Reports & More

MBMA MEMBER MANUFACTURING PLANTS
Metal Building Manufacturing Facilities Across North America

MBMA MEMBERS
A Listing of Companies That Make MBMA Strong

MEMBERSHIP COMMITTEE
Celebrating Success as Member Numbers Rise
As I look back over the last year, I cannot help but think about what I’ve learned and how our industry has changed through this precarious pandemic. Personally, I see a lot of good as the pandemic forced us to assess our businesses and our industry, and to strengthen our resiliency in the face of many challenges.

Education is a foundational principle at MBMA. And as chairman of the association this year, it became abundantly clear to me the role that the MBMA plays in education and lifelong learning. This focus is invaluable, especially as we look for better ways to attract and retain talent in our own organizations—and while we inform our potential customer base about the many benefits of our building solutions. When mentioning education in our industry, our minds typically go to our engineers and technical staff—what are we doing to keep them on the cutting edge? But I believe we need to be far more aggressive in providing useful training and development for employees at all levels. What has become even more apparent to me is the importance of fostering learning across our organizations—and this starts on the shop floor.
Many of us have relationships with local trade schools, and while this may have been enough in the past, today we need to support STEAM (science, technology, engineering, arts and mathematics), vocational and business education programs to develop talent for our entire future workforce. It is up to us to reach deeper, to educate and to fill the gaps.

It is important that we leverage all available tools to train current employees and to influence future ones. MBMA has over 50 videos on YouTube that educate and inform. Two of my favorites are the “How It’s Made” and “How It’s Built” videos, which help everyone see how our buildings are manufactured and erected. These engaging programs are available to view along with others at www.youtube.com/MBMAmedia.

It is up to us as leaders to push our industry forward, and education is a key part of this. We can all learn something new every day!
THE ROARING TWENTIES?

William Harding won the U.S. presidential election of 1920 under the campaign slogan, “A Return to Normalcy.” The normalcy to which he was referring was a time before World War I and the 1918 flu pandemic. Despite his best efforts, Harding found there was no going back to those simpler times. A post-war, post-pandemic boom in the emerging industries of automobiles, movies, electric appliances, telephones and air travel fueled a new normal known as the Roaring Twenties.

One hundred years later, we find ourselves at the beginning of a new ’20s. With the emergence of three new vaccines, we entered 2021 hopeful for a repeat of a post-pandemic Roaring Twenties. As 2021 comes to a close we find, just as Harding did, the global economy is never quite that simple.

In the metal building systems industry, 2021 saw a surge in demand as numerous projects that had been delayed due to the pandemic were given the green light. Many members subsequently invested in facility expansion and talent acquisition. They also targeted growing markets like distribution and specialty retail.

Unfortunately, that demand was coupled with a shortage in our primary raw material: steel. Economics 101 kicked in and the increased demand coupled with decreased supply led to higher prices. MBMA stepped in as an advocate on our members’ behalf, reaching out to steel suppliers and advocating for efforts to close the supply/demand gap.

As MBMA members ramped up production, they also adapted to the realities of a lingering pandemic. Annual builder meetings hosted by building manufacturers were converted to virtual events. MBMA followed suit, holding a virtual spring meeting in conjunction with our partners at MBCEA. Online meetings continued through the summer until finally we were able to meet face-to-face, starting with a late-August board
of directors meeting that was followed by three committee meetings: safety, accreditation and energy/sustainability. These were held as hybrid events with both in-person and virtual attendees. MBMA invested in new technology to make the interaction among attendees as seamless as possible.

At the annual Safety Workshop, attendees discussed the ongoing challenges of keeping employees safe not only from typical industrial threats, but also from the COVID-19 delta variant. They shared successes and challenges in their companies’ safety programs and discussed the evolving COVID-related OSHA requirements.

Despite the pandemic challenges, MBMA pioneered new initiatives such as our first annual architectural student design competition. With over 70 students registered, we are excited to see their creative metal building design concepts for a new elementary school.

So, are we on the doorstep of a new Roaring Twenties? Only time will tell. But MBMA members can rest assured that whatever the next decade brings, MBMA will be their partner and a solid resource supporting the success of the entire metal building industry.

About MBMA
Founded in 1956, the Metal Building Manufacturers Association (MBMA) serves manufacturers and suppliers as it works to promote the metal building systems industry. Its membership supplies high-quality buildings for use in commercial, retail, office, industrial, institutional and other end uses. The association provides a wealth of useful information on its website, MBMA.com, for anyone who works with or is interested in metal building systems. Resources include technical materials, research reports and design guides.

MBMA Management
MBMA has been managed by Thomas Associates, Inc. (TAI) since 1956. TAI is one of the longest-running success stories among association management firms in the United States. It has an extensive and diverse technical team that can support the codes, standards and research goals of its various client associations. Such synergy allows it to expand research capabilities and bring in human resources that enhance the technical strength of MBMA.

General Manager
Tony P. Bouquot
Director of Research and Engineering
W. Lee Shoemaker, Ph.D., PE
Senior Staff Engineer
Vincent E. Sagan, PE
1950s
- 13 companies launch MBMA
- Straight, sidewall panels and color-coated panels used in commercial applications
- Manufacturers begin utilizing builder/dealer networks
- Technical Committee is created
- Publishes first technical manual

1960s
- Member sales climb to $98.9 million
- Ranks expand to 16 members, 23 plants and 1,000 dealers/builders
- Study of tapered structural members sets in motion first major research venture
- Metal building serves as example of tapered structural members
- Creation of factory-insulated wall panels and earliest UL-approved roof

1970s
- Achieves $363 million in member sales
- Association increases to 25 members, 40 plants and 3,000 dealers/builders
- Pioneers use of bolted end-plate connections in U.S.
- Introduces flat-profile metal roofs
- Factory-insulated sandwich wall panel boosts energy savings
- Delves into wind load research

1980s
- Member sales escalate to $1 billion
- Organization swells to 35 members, 74 plants and 8,000 dealers/builders
- Circulates first trade publication Metal Building News
- Conducts research on behavior of roofing systems under gravity loads
- Publishes Metal Architecture magazine
**1990s**
- Member sales exceed $1.5 billion
- Partners with Rensselaer Polytechnic Institute in research endeavors
- AISI adopts base test to predict purlin capacity in continuous span system
- OSHA teams up with steel industry coalition to upgrade manufacturing guidelines for metal decking and roofing

**2000s**
- Over $2.9 billion in member sales
- Directs initiative to develop seismic design guide for metal buildings
- Joins with AISI at Virginia Tech to investigate bracing anchorage forces
- AC472 inspection programs for metal building systems manufacturers approved by IAS
- Energy Committee is formed

**2010s**
- Issues Environmental Product Declarations for primary framing, secondary framing and wall and roof panels
- Groundbreaking educational initiative provides AISI faculty fellowships
- Invests over $1 million for technical research programs

**2020s**
- Successfully transitions association activities to the virtual environment in the midst of a worldwide pandemic
- Partners with the University of Wisconsin on virtual reality project
- Adds Architecture Committee
- Launches MBMA educational website for architectural faculty and students
- Launches first annual student design competition

**ADVANCEMENTS THROUGH RESEARCH**
- Tapered Structural Members
- Cold-Formed Steel
- Bolted End-Plate Connections
- Wind Load Research
- Metal Roofing Systems
- Wind Uplift Tests
- Snow Load Research
- Bracing Anchorage Forces
- OSHA/SENRAC Standards
- Purlin Anchorage
- Seismic Research
- Fire Resistance
- Air Leakage Testing
- Hail Research
- Gravity Loads
Accreditation Committee

TANNER MOY
Committee Chair

ACCREDITATION GIVES IMMEDIATE CREDIBILITY TO METAL BUILDING INDUSTRY FIRMS

MBMA’s 20-person Accreditation Committee oversees all activities related to member accreditation through the International Accreditation Service (IAS). The IAS accredits the inspection programs of companies that design and fabricate engineered metal building systems. It is based on requirements in IAS Accreditation Criteria AC472, International Building Code and related standards. Accreditation criteria covers inspections of elements that are essential for designing, specifying, building or approving metal building systems. AC472 is a highly impactful quality assurance initiative that continues to set the pace for the industry. MBMA requires that all association members in the Building Systems category attain and maintain AC472 accreditation. We recognize that it adds value for the end customer and differentiates the metal building systems industry from other forms of construction.

The COVID-19 pandemic has made it difficult this year—and last—to do our part to help IAS strengthen the accreditation process. We were finally able to have a face-to-face meeting in October, which was highly productive. One accomplishment was our partnership with IAS to develop an article, “Non-destructive testing—Building code requirements and IAS AC472 accreditation,” which appeared in...
the ICC Building Safety Journal in June 2020. We also assisted in the preparation of a second Building Safety Journal article that appeared in the publication this past January: “Building officials benefit from IAS AC472 and AC478 in low-rise construction.”

The IAS developed a similar certification for the contractors and erectors involved in metal building construction. IAS AC478 now offers Metal Building Assemblers Inspection Accreditation, which is for companies that perform the on-site building assembly. At the construction site, a building official can reduce redundancy when observing a construction team whose standards and practices have been vetted through inspections already required by AC478. MBMA asks its Building Systems member firms to encourage affiliated building erectors to become accredited. We on the MBMA Accreditation Committee actively promote the benefits of both AC472 and AC478 through articles, presentations and other methods.
The Architect Committee is young. We were formed in 2020, but we are already making great strides. Our most significant project is a long-term plan to influence architects’ understandings of sustainability, versatility and the (almost) limitless aesthetics of metal building architecture.

We immediately started with a look to the future through the development of teaching tools to educate undergraduate and graduate architecture students. We aim to help them understand when and why metal buildings are an ideal architectural solution for many building types. This year, in coordination with the Education Committee, we developed the concept, and next year we’ll begin creating education folios on specific metal building projects.

We are also working with the Education Committee to introduce MBMA’s inaugural student design competition. Full-time graduate and undergraduate students with faculty sponsors have signed up and submitted ideas for the design of an elementary school using metal building components. MBMA will be awarding $15,000 in prizes next February.

We again partnered with the Education Committee to develop MBMA’s second annual Architectural Faculty Workshop.
Attendees were introduced to a variety of metal building ideas from both fellow members of academia and architects in the corporate environment. Not only did they gain great knowledge, but they also received access to a wealth of free publications and resources related to metal building design.

The Architect Committee’s mission is to positively impact the metal building industry through effective understanding, comprehensive education and the collaborative engagement of architects, both at the national and local levels. To that end, I have challenged the committee to reach out to one new person every day to tell them about the architectural value of metal buildings and the quality designs that can evolve through the use of metal building materials. I will now ask, nay challenge you, to join us in this effort. Will you also reach out each day to your contacts in the design community and share with them the attributes of a metal building solution? I hope and trust you will! And I hope you’ll encourage them to come be a part of MBMA. It’s a tremendous organization with a wealth of research that provides architects with more options in building design and construction.
A VERY PRODUCTIVE YEAR!

What did MBMA’s Education Committee accomplish in 2021? I can answer that in one word—LOTS!

We rolled out the architecture student design competition that was developed in 2020 to promote metal buildings and raise awareness among college students and faculty. We are nearing completion of our Virtual Reality Experience, a tool that lets students and faculty walk through a metal building and see all its fascinating intricacies. We’re now determining the best way to distribute the software to architecture schools and to develop a plan to share it with many relevant audiences. It’s very exciting technology! We also completed our second annual faculty workshop, featuring high-profile professors such as Marci Uihlein, PE (University of Illinois’ School of Architecture), Donna Kacmar, Ph. D., FAIA (Gerald D. Hines College of Architecture and Design at the University of Houston) and Greg Snyder (University of North Carolina-Charlotte’s School of Architecture.) Our keynoter was from the corporate world: Taryn Kinney, AIA, the K-12 Education Leader at DLR Group, one of the largest architecture firms specializing in K-12 design. It was a terrific program.

If you know of college faculty members who could benefit from this education, please share their information with us and we’ll invite them to our next workshop.
In other news, we developed a new online learning course for architects with BNP Media to be placed in Architectural Record: “Specifying the Latest in Metal Buildings.” This is the ninth Architectural Record course that MBMA has created and all have been extremely well-received. In 2021, the MBMA courses, “Using Metal Building Systems to Meet and Exceed the Energy Code” and “Creative Building Solutions with Pre-Painted Metal Panels,” both won awards for generating the most leads over the past year, and the latter was recognized as the fastest-moving continuing education course for that same time period.

In addition, we developed AIA-approved presentations for delivery via a “lunch and learn” format to AIA chapters nationwide. We’ve had a very productive 2021 and are looking forward to expanding our efforts in the year to come.
ASSURING ENERGY EFFICIENCY IN METAL BUILDINGS IS OUR TOP PRIORITY

MBMA Energy Committee members are working hard to collect energy-related data and to develop best practices that will ultimately benefit the entire metal building industry.

As we move forward with our efforts, we especially appreciate the opportunity to collaborate with other industry groups, including the Metal Building Contractors and Erectors Association, the North American Insulation Manufacturers Association and the Door & Access Systems Manufacturers Association. These partners support us in numerous ways. They help us by participating in testing, reviewing documents and reports, co-funding research, providing expert advice, and by promoting our activities.

For example, we are continuing to perform air leakage testing that will lead to a best practices guide for designing and constructing metal buildings that meet or exceed IECC and ASHRAE energy code requirements. We tested four buildings in 2020 and four more in 2021, with plans to complete this effort in 2022. Ultimately, our research will benefit MBMA members, architects, contractors, builders and building owners.
As a result of our air leakage research, we were invited to speak to various groups across the country this year and provided a comprehensive program at METALCON, the largest international event in the metal construction industry.

We’re also proud to announce that one of our educational efforts received national recognition. Our course, “Using Metal Building Systems to Meet and Exceed the Energy Code,” was honored by Architectural Record magazine for generating the most leads over the last year.

The highlight of the year was our Energy and Sustainability Workshop, which took place in Dallas in November. Collaborating with MBMA’s Sustainability Committee, we conduct this workshop every two years. Our primary objective is to educate attendees about recent changes in national and state energy codes and what changes are anticipated for the future.

Finally, all this important work would not get done without the diligent, behind-the-scenes efforts of the MBMA technical staff. Their coordination and organization of our programs and research activities are invaluable, and we appreciate them very much.
RESEARCH ADDRESSES FIRE & HAIL CHALLENGES

MBMA’s Fire & Insurance Committee has been busy in 2021. One significant activity was performing fire and air leakage testing for a new continuity joint assembly developed last year. The assembly stops at the bottom of the purlins and doesn’t enter the purlin cavity, resulting in walls that can go up after construction is done and not disturb the insulation and vapor barrier. Testing was completed in February, and we are working on documentation showing compliance with building code requirements. We’ve also updated existing continuity joint assemblies that were adapted for use with filled cavity insulation. You’ll find the six new enhanced UL assemblies on the MBMA website at www.mbma.com/Fire_Protection.html.

We were also pleased to be invited to participate with the Department of Civil and Systems Engineering at Johns Hopkins University on an AISI Standards Council Fellowship research project. The research pertains to Structural Design for Fire Conditions of a Prototype Metal Building using the New Proposed Appendix to AISI S100, the cold-formed steel member design specification. We have shared design calculations for various rated cold-formed, steel-framed wall assemblies with the researchers,
who are incorporating the data into their fire model and will create a report detailing how cold-formed steel members respond during a simulated fire. The AISI fire project will demonstrate the effectiveness of existing and new fire protection design methods in metal building systems to design professionals and code officials. Those participating on behalf of MBMA include MBMA Fire Protection Counsel, Nestor Iwankiw, PE, SE, PhD; MBMA Senior Staff Engineer, Vincent E. Sagan, PE; and me.

The committee is also working with Ron Dutton Consulting Services LLC on an executive summary of two recent hail research projects, documenting the effects of hail impact on the durability of GALVALUME® SSR panels, highlighting one roof that has been in service for over 40 years. We look forward to sharing this document with the insurance industry.
MARKETING INITIATIVES MAKE KNOWLEDGE SHARING A PRIORITY

We’re proud to have a robust Marketing Committee with 53 active members. We meet online regularly to update our goals and review our progress.

Our function is to be the mouthpiece for the MBMA. We create and aid in the development of resources that educate our audiences about metal building systems. Through various media channels, we target and influence architects, engineers, building owners, general contractors, erectors, code officials, developers, educators and students, as well as the general public.

In the last six years alone, we’ve developed 50 videos, which you can view on our YouTube channel at www.youtube.com/mbmamedia. The videos delve into topics such as: what it’s like to work for a metal building manufacturing company; how a metal building is professionally erected; and how metal buildings are designed to withstand the forces of nature. These videos are tools that can be used by the association members.

We’ve also completed nine industry-specific case study documents that provide examples of how metal buildings are used for different types of facilities within varied end-use applications. All are available for free download at www.mbma.com/case_studies. I would ask that our members familiarize themselves with these tools and share them prolifically.
Some of our most meaningful work comes through promoting the efforts of the Education and the Architect committees as they work to enhance their programs; and from the Fire & Insurance Committee as it updates materials, such as fire-rated assemblies and insurance bulletins. Our regular press releases make known the accomplishments that the MBMA achieves.

Social media also remains a high point of our efforts, with followers and engagements growing day by day. We post to LinkedIn and Twitter weekly, so be sure to follow MBMA to keep current on our actions—and don’t overlook our very popular blog, at www.mbma.com (just click on the blog tab).

We have developed a plan and objectives for our 2022 program and look forward to advocating and educating to further MBMA’s leadership role in promoting the value of metal building systems.
Steve Browning was chair of MBMA’s board of directors in 2019. I give him kudos for coming up with the idea that year to create MBMA’s first Membership Committee.

With just nine people, the fledgling committee began setting its goals this past January. We started out by determining a short list of companies that we believed would benefit exponentially from corporate participation in MBMA—companies that would most benefit from the leadership, research, education and networking opportunities that are hallmark attributes of the 65-year-old association.

Sure enough, it wasn’t long before we were ticking off new members from the shortlist. This year, we’ve welcomed six firms to the MBMA fold. In the Building Systems member category, we hailed AGI Sentinel. In the Associates category, we added Curbs Plus, FRAMECAD, PrimX North America, Wolverine Advanced Materials and Thornton Tomasetti.

Considering all of the COVID-induced roadblocks to in-person meetings and circumvented travel, we were thrilled to add so many new members—a record increase over recent years. None of this would have been possible without the interplay of several key factors. First, credit goes to the participants in the
Membership Committee who gave thoughtful input into updating our new member outreach materials. Secondly, we appreciate the valued shortlist recommendations offered by those serving on the MBMA board of directors. Not only did those leaders provide names and contact information, they also reached out to potential members who were in their sphere of influence and shared personal accounts of what value MBMA has brought to their firms and their employees. Finally, a big thanks goes to Tony Bouquot, general manager of MBMA, and to his staff who kept us all organized, handled prospective member meetings and provided the collateral material updates that helped us seal the deal with incoming members.

So, here’s to 2022! We are energized to exceed our 2021 new member count and excited to develop an even more robust outreach effort. Any employee of an MBMA member firm is welcome to join our committee and help us increase our activities.
The MBMA Safety Committee is made up of safety professionals who work within the metal building systems industry.

Our job is to educate employees in our plants and offices so they will keep safety top of mind and do their part to ensure safety in their work spaces.

The main way that we help them is to provide safety webinars that we broadcast into their workplaces so that as many employees as possible can attend. The webinars are usually held in rooms where the employees can all come together and view the programs as a group. After they watch each webinar, we ask them to remain together and discuss how to implement what they’ve learned and to adapt the lessons in their specific environments. Due to the continuation of the COVID-19 pandemic, we were only able to hold three webinars this year—but we still clearly reaped benefits.

We know that the webinar format works because employees always voice suggestions for how to improve safety after they attend the webinars. This is extremely important because each office and plant is one-of-a-kind. Each is set up differently, and each has practices and procedures and people that are unique to that location. Since no two facilities are the same, we can’t dictate how to implement the best safety approach.
without the commitment and buy-in of the people working right there. They need to tweak what they learn to make it most effective in their circumstances.

The MBMA Safety Committee recognizes that a company can’t have a good safety program without a good safety education program—and an action plan for implementation. Any time you see a good safety culture, if you dig deep, you’ll find there’s a good education program at its core. So, when our Safety Committee meets, we are focused on continually improving the educational programs we create.

We will continue to explore ideas and alternatives to keep employees and their families out of harm’s way. That’s our mission and our job.
Statistics Committee

WE’RE ALL ABOUT NUMBERS

Educating MBMA members is the very purpose of the MBMA Statistics Committee. We oversee the creation of 16 reports that share data on many facets of the state of the metal building industry. All of our reports are confidential and exclusively provided to MBMA members.

Our Quarterly County Shipment Report shows how metal building shipments are distributed among over 3,000 counties in the U.S. This allows sales leaders to measure their performance compared to the rest of the industry and to assess possible areas of opportunity.

The Annual End Use and Annual Square Footage reports show members what project types and sizes were shipped in the previous year, giving marketing departments information that helps them build effective strategies and anticipate industry trends. The quarterly Manufacturing Productivity Report and Engineering Productivity Survey both give leaders a performance benchmark to ensure their firms are on par with the rest of the industry.

These and the many other MBMA statistics reports give leaders industry-specific knowledge that assists them in charting a course for success. There are no other sources from which to cull such specific industry data, so we are very proud to play a role in assuring that the quality and comprehensive nature of the data remain high.
The Statistics Committee is composed of both MBMA manufacturing firm members and Associate members that supply goods and services to the industry. We look at the numbers from diverse perspectives and that helps us see the data from a variety of viewpoints. We feel such diversity is very valuable in helping us achieve our mission.

One task we helped complete this year was to add Federal Information Processing Standards (FIPS) codes to county data for reports that compile sales data. FIPS, a universal code that uniquely identifies geographic areas, is incorporated into all commercial mapping software today. Providing sales FIPS to MBMA members now allows them to map exactly how much metal building sales activity is occurring in various sectors of the U.S.
One of the most influential projects of the MBMA Sustainability Committee was the updating of environmental product declarations (EPDs) for three metal building product categories: primary rigid framing, secondary framing, and metal cladding for roofs and walls. They are available on the MBMA website at www.mbma.com/Environmental_Product_Declarations.html. These EPDs provide specifiers, designers and other industry professionals with transparent, third-party documentation of the environmental impacts of products used in metal building systems. These industry-average reports can be used by all MBMA members to show compliance with LEED and other high-performance energy programs. MBMA members are dedicated to educating others about the sustainable performance of metal building systems, and these EPDs effectively do that for the design community.

MBMA’s EPDs summarize the cradle-to-gate environmental impacts of a metal building system. The cradle-to-gate method is used to describe the impact of producing products—from raw material extraction, through processing, fabrication and up to the finished product leaving the manufacturing facility. Our work was completed in partnership with the Athena Sustainable Materials Institute.
The EPDs were developed as a result of our efforts to update MBMA’s industrywide life cycle inventory (LCI) report, which practitioners use in their Life Cycle Assessment (LCA) software programs. Our data was compiled from information provided by MBMA’s manufacturing member firms. As found in our previous LCA efforts, metal buildings ranked very favorably compared with other forms of construction. The LCA information is important because it allows us to promote and track the continuous improvement of the environmental performance of metal building component products as technology improves over time. It also allows member companies to benchmark their plant-specific product footprint against a valid industry average. In addition, the data supports the development of derivative works, such as industry-average carbon footprint reporting and/or sector-level EPDs.
TECHNICAL CHALLENGES, RESULTING SOLUTIONS: MBMA HELPS TO IMPROVE CODES AND STANDARDS

MBMA is identified as a leader in the construction industry due to its proactive involvement in codes and specifications and its efforts to educate the industry about its ongoing research results.

One significant Technical Committee contribution was our involvement in the *AISC Design Guide 4 + 16*. It is the second edition of the earlier guides 4 and 16, combining them into a single guide. Design Guide 16 addresses “Flush and Extended Multiple-Row Moment End-Plate Connections” while Design Guide 4 deals with “Extended End-Plate Moment Connections—Seismic and Wind Applications.” These publications incorporate the findings from MBMA’s long history of research on bolted end plates and include recent developments uncovered by our research.

We are also taking a leading and proactive role in the development of *ASCE/SEI 7-22 “Minimum Design Loads and Associated Criteria for Buildings and Other Structures.”* It establishes the minimum load standards that drive building codes. MBMA’s wind load testing is critical to the completion of this document, and this is the first time that ASCE has taken a funding role in
wind load research, which has been ongoing for several years. Our efforts will help enhance the next edition of the load provisions. One highlight of the new standard is simplification to a single approach while addressing differences in wind load based on building geometry.

As part of our ongoing efforts to educate and inform various key constituents, the Technical Committee continued with online Design Seminar sessions addressing research findings and general design topics related to metal buildings. This series shares information with many individuals at MBMA member companies and has led to opportunities to speak to groups nationwide, expanding knowledge and expertise throughout academic and professional communities.

All of our efforts described above have provided excellent opportunities to educate our members and the industry on specific strengths and challenges of metal buildings and how these structures meet the needs of the construction industry and the broader public.
ANATOMY OF A METAL BUILDING SYSTEM

Metal building systems are interdependent assemblages of structural elements that work together to create a very efficient structural system. The basic elements of the metal building system are primary frames (structural steel members), secondary purlin and girt members (cold-formed steel and steel joists), and metal roof and wall cladding systems.

Metal building systems can span great widths and lengths with or without additional interior supports. Where very large areas are required, and interior columns are not a problem, the modular rigid frame is an ideal solution. These provide flexibility in layout and design and ease of expansion for future growth. With a roof slope of 1/4 inch to 12 inches, even a 1,000-foot building can be designed without excessive height.

One of the inherent advantages of a metal building system is the industry’s ability to utilize “welded up” frames as opposed to mill sections. In this way, the engineer, using sophisticated computer programs, can design the most efficient shape for the building frame. The steel material is placed where it is needed and eliminated from where it is not, adding economy without compromising design.
EDUCATIONAL & TECHNICAL RESOURCES

TECHNICAL MANUALS & GUIDEBOOKS
Download previews and full documents or order print versions at www.techstreet.com/mbma.

2018 Metal Building Systems Manual
Metal Roofing Systems Design Manual - Second Edition
Fire Resistance Design Guide for Metal Building Systems
Seismic Design Guide for Metal Building Systems
Guide for Inspecting Metal Building Systems, Second Printing

CONTINUING EDUCATION FOR AIA CREDITS
Produced in partnership with the American Institute of Architects and Architectural Record magazine. MBMA’s CEU/LU courses are extremely popular with AIA members and others in the architectural community. Each program is now available through Architectural Record’s Continuing Education Center: www.architecturalrecord.com/topics/2141-architect-continuing-education.

Creative Building Solutions with Pre-painted Metal Panels
Specifying a Metal Building System
Life Cost Assessment/Sustainability of Metal Buildings
Creative Metal Building Design Alternatives

TECHNICAL & EDUCATIONAL RESOURCES
Download these free documents at www.mbma.com.

AC472 Accreditation Program
Acoustical Performance of Insulated Metal Building Roof and Wall Assemblies
Athena Impact Estimator Case Studies
Concrete Masonry Walls for Metal Building Systems
Environmental Product Declarations: Primary Structural Steel Frame Components, Secondary Structural Steel Frame Components and Roll-Formed Metal Wall and Roof Panels
Fire Protection for Metal Buildings Fact Sheet
Insurance Bulletins (10)
Insurance Facts
MBMA Annual Reports

CASE STUDIES
Download these free documents at www.mbma.com.

Educational Campus Facilities
Government Facilities
Commercial Communities
Distilleries & Breweries
Warehouses & Storage
Retail & Wholesale
Recreation & Fitness
Vehicle Sales & Service
Roofing & Solar
POPULAR VIDEO RESOURCES

All videos are accessible at www.youtube.com/MBMAmedia

How It's Made: Metal Building Innovations Are Revolutionizing Low-Rise Commercial Construction
How It's Built: Metal Building Construction Raises the Bar for Low-Rise Commercial Structures
Metal Building Systems: Wind Loads - Longitudinal
Metal Building Systems: Wind Loads - Transverse
Metal Building Systems: Gravity Loads
Metal Building Systems: Nomenclature
AC472: Why Accreditation Matters
An Introduction to Metal Building Systems
Metal Building Systems 101
Come Build Your Future (plus 13 career option videos)
Get More with Metal: Recreation & Fitness
How Metal Buildings Compete in Today's Market (Parts 1-3)
Interview with Professor Marci S. Uihlein, University of Illinois at Urbana Champaign School of Architecture
Metal Building Systems Speed of Construction
Sustainability for Metal Building Systems
What Do You Know About Metal Buildings?
Why Choose Metal Building Systems?
Why Join MBMA?
Why Metal Building Systems? with Dr. Lee Shoemaker

WEBINARS

All MBMA webinars are accessible at www.youtube.com/MBMAmedia.

Energy Code Compliance for Metal Building Systems (Parts 1-4b)
Fire-Resistance Design for Metal Building Systems (Parts 1-5)
Sustainability for Metal Building Systems
Using EPDs to Drive Value with Metal Building Systems
Metal Building Systems and Life Cycle Assessment
Safety in the Workplace (11-Part Series)
UL Webinar: Environmental Product Declarations
Athena Presentation: Life Cycle Assessment
MBMA building manufacturers maintain plants nationwide that deliver building systems to customers across the globe.
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MBMA MEMBERS

BUILDING SYSTEMS MEMBERS
ACI Building Systems
AGI Sentinel
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American Buildings Company
Associated Steel Group
Behlen Building Systems
Bigbee Steel Buildings
BlueScope Buildings North America
Butler Manufacturing
CBC Steel Buildings
Ceco Building Systems
Chief Buildings
CO Building Systems
Cornerstone Building Brands
Dean Steel Buildings
Golden Giant
Heritage Building Systems
Inland Buildings
Kirby Building Systems
Ludwig Buildings Enterprises
Metallic Building Company
Northern Building Systems
Nucor Building Systems
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Pinnacle Structures
Red Dot Buildings
Reed’s Metals
Robertson Building Systems
Schulte Building Systems
Spirco Manufacturing
Star Building Systems
Sukup Manufacturing Company
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Tyler Building Systems, L.P.
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Varco Pruden Buildings
Vulcan Steel Structures
Whirlwind Steel Buildings

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Birmingham Rail & Locomotive
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Diamond Door Products
D.I. Roof Seamers
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