

MBMA 2011 ANNUAL REPORT

Raising the Standards

MBMA Brings Engineering Leadership to Metal Building Industry

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MBMA Mission

It is the mission of the Metal Building Manufacturers Association to advance the collective interests of the metal building systems industry.

About MBMA

MBMA has served metal building systems manufacturers and suppliers for 56 years. Its membership represents more than \$1.9 billion in annual steel shipments and accounts for approximately 49% of the total non-residential low-rise construction market in the United

States. MBMA provides engineering leadership through the many research programs that it sponsors annually, often in coordination with major universities and engineering schools throughout North America. This research is used to improve the performance, efficiency, and quality of metal building systems and to elevate the technology used to produce them.

The demand for metal building systems continues to grow and the marketplace continues to embrace these systems

because of their versatility, reliability and sustainability. While non-residential construction continues at depressed levels, metal building shipments were up approximately 19%. That is why metal building systems have been able to maintain and grow their market share to over 49% of the low-rise commercial building category. From strip centers, to car dealerships, to medical clinics and airplane hangars, metal buildings continue to gain acceptance throughout economic cycles and circumstances.

TECHNICAL LEADERSHIP PROPELS OUR INDUSTRY

Chuck Haslebacher, MBMA Chairman, 2010 and 2011

While the economy inches forward with occasional fits and starts, the Metal Building Manufacturers Association (MBMA) continues to lead the metal building systems industry, charting a path for future growth through technical insight and expertise. MBMA's cutting-edge research, its accreditation program and the association's ongoing educational efforts are helping member companies to remain at the forefront of the low-rise, non-residential construction sector.

Metal building systems are well-positioned in the marketplace and MBMA works diligently to maintain and improve that position. Metal buildings are increasingly viewed as energy-efficient and sustainable structures, making them an ideal choice for all kinds of uses, from churches, schools, and recreational facilities to firehouses, warehouses, and office buildings.

Additionally, we are working proactively to ensure that metal buildings and their specific attributes are appropriately addressed in new and existing codes and standards. An important part of this effort includes MBMA-sponsored research on metal building structures and assemblies. This research enables our members and the industry to thoroughly understand the behavior and performance of metal building systems and to incorporate this knowledge into design methodologies and to evaluate changes in codes and standards. Just as importantly, these research projects, and the proactive efforts of the MBMA staff, help to keep officials aware of the performance benefits and abilities of metal buildings.

Another area where MBMA is taking a leading role is in life-cycle assessment, or LCA. This provides a means for analyzing the environmental impacts of a building throughout its life. LCA will ultimately influence many sustainable building initiatives. MBMA recognizes this and is spearheading efforts to assure that metal building information is included in LCA databases and assessment tools.

Within this sphere, sustainable building standards and programs, such as ASRAE 90.1 and 189.1, LEED, and the IgCC, continue to evolve and to grow in acceptance. MBMA is working to keep its members informed and ahead of the ever-expanding green building efforts throughout the country through issue-specific research and educational programs and resources.

Finally, MBMA has many technical resources available for anyone who has an interest in metal building systems, be it an owner, builder, architect or specifier. MBMA's design guides provide essential metal building systems information—from energy design to fire resistance. Additionally, MBMA offers a wealth of resources at no cost on its website, www.mbma.com. As we move forward, MBMA will continue to provide the technical leadership to guide our industry through both difficult and prosperous times, thanks to the ongoing commitment of our dedicated members. If you would like to learn more about MBMA and to find out how your firm can benefit from participation in this association, contact the assistant general manager, Charles Praeger, at (216) 241-7333.



Photo credit: Phillip Parker

Chairman's Introduction



General Manager's Perspective

MBMA EFFORTS POINT TO THE FUTURE

Charles Stockinger, MBMA General Manager

Since its beginnings in 1956, the Metal Building Manufacturers Association has played a significant leadership role in the growth and acceptance of metal building systems in the low-rise, non-residential construction market. Consistent and respected research, combined with development of unique educational resources, help position the organization and its members as industry leaders.

MBMA provides direct leadership to the industry and for our member companies through a variety of initiatives, which are laid out each year in our strategic plan. Our many technical research programs—undertaken in partnership with major research universities and national laboratories such as the Oak Ridge National Laboratories (ORNL)—lead to improved performance of metal building systems and keep this building technology a relevant and growing design/build alternative in the construction industry.

In late 2011, the MBMA Annual Meeting took place in Atlanta, with about 90 attendees from 16 Metal Building Systems Member companies and 31 Associate Member companies. The attendees heard presentations from all of the MBMA committee chairs. This annual report highlights significant accomplishments from these committees and describes what they plan to do in 2012 and beyond.

I would like to thank the committee chairs and the committee members for all the time and work they invest. Hundreds of meetings and thousands of hours go into every technical accomplishment we achieve, making MBMA the industry leader that it is today. We certainly couldn't do it without the expertise and input of brilliant individuals in our member companies as they share their knowledge and skill for the betterment of the industry.

I also acknowledge the excellent work that MBMA's professional staff creates throughout the year. The MBMA leadership, part of the Thomas Associates team, continue to drive the association forward through their hard work, knowledge, and commitment to excellence.

I must also pay special tribute to Chuck Haslebacher for his selfless contribution to the association. Typically, the role of MBMA Chairman is held by an industry leader for just one year, due to the massive responsibility and time commitment that this role requires. Due to the serious market events and the high priority projects undertaken by MBMA, to our benefit, Chuck stepped up to the plate and accepted a second term, providing cohesive leadership. This is one of just a few times in MBMA's 56-year history that one person has served two consecutive terms as Chairman. Thank you, Chuck, for your dedication.

MBMA LEADERSHIP

Charles E. Praeger
Assistant General Manager

W. Lee Shoemaker, Ph.D., P.E.
Director of Research and Engineering

Dan J. Walker, P.E.
Senior Technical Engineer

Jay D. Johnson, LEED AP
Director of Architectural Services

MBMA is managed by Thomas Associates Inc., one of the oldest and largest association management firms in the United States. It has an extensive and diverse technical team that can support the code, standards, and research goals of its various associations. Such synergy allows us to expand our research and to bring in human resources that enhance the technical strength of MBMA.



B&B Theatres, Ozark, MO
Photo: J. Price Architecture

ACCREDITATION UPDATE

By the end of 2011, all MBMA Building System Member companies achieved accreditation in accordance with the International Accreditation Service (IAS) AC 472, the IAS Accreditation Criteria for Inspection Programs for Manufacturers of Metal Building Systems. The MBMA Board continues to affirm its commitment to a comprehensive quality assurance program that adds value for the end customer and differentiates the metal building systems industry from other forms of construction.

The IAS program is a requirement for MBMA membership for Building System Members. It mandates that accredited fabricators implement a comprehensive quality-management system covering all phases of its engineering and fabrication processes. Today, there are 117 accredited metal building manufacturing facilities for AC472 Parts A, Part B, and/or Part C.

AC472 is the most comprehensive quality-assurance accreditation program of its kind and is designed specifically for manufacturers of metal building systems. A subsidiary of the International Code Council, this nonprofit, internationally recognized accreditation body was created to assist code officials in their jobs to enhance public safety. Most members of the IAS Board and Accreditation Committee are code officials.

EDUCATIONAL AND TECHNICAL RESOURCES

Manuals, Design Guides, Webinars, and Free Educational Materials

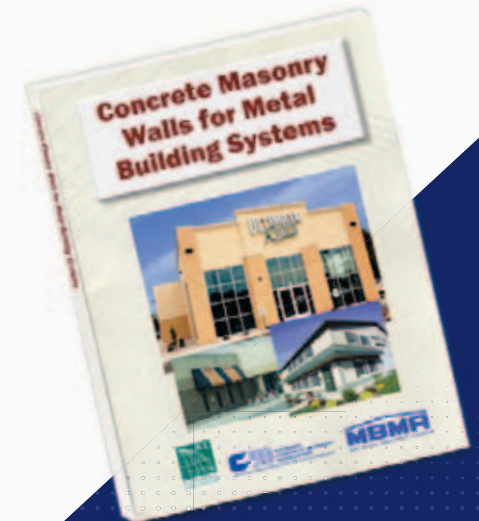
In 2011, MBMA continued to lead the metal building systems industry and fulfill its mission by providing educational, research, and technical resources that enhance the collective interests of the metal building systems industry. These resources include an increasing number of metal building design guides and manuals that are invaluable for anyone who works with metal buildings anywhere in the world. This past year, in order to help users understand some of these guides and their technical content, MBMA introduced a set of webinars that have been very well received. Additionally, the association now provides an array of information resources available for free download at www.mbma.com.

2011 EDUCATIONAL HIGHLIGHTS

New Manual Introduced

Concrete Masonry Walls for Metal Building Systems

The 2nd edition of this manual is published jointly by the MBMA, the National Concrete Masonry Association (NCMA), and the International Code Council (ICC). It is written for designers and manufacturers of metal buildings that use or are interested in using masonry hardwalls with metal buildings. It includes information on the latest masonry design standards and industry practices, as well as helpful design aids, construction recommendations, and details on how to integrate masonry walls with metal buildings. There are sections on the many positive aspects of masonry walls for metal buildings, such as their aesthetic appeal, energy efficiency, noise control, and water penetration resistance. The major focus of the manual is on the design and structural aspects of masonry walls with metal buildings. These sections discuss in detail subjects such as movement design considerations and lateral drift, detailing at the foundation, reinforced concrete masonry design requirements, and building loads. There is also an appendix that offers masonry design examples using the NCMA Structural Masonry Design System Software (CMS10V5).



MBMA Webinars

MBMA developed two new webinars that were successfully introduced in the fall of 2011. The Energy Committee introduced the Energy Code Compliance for Metal Building Systems webinar while the Committee on Fire Protection and Related Insurance Matters instituted the Fire Code Compliance for Metal Building Systems webinar. These two webinars target member companies, builders, code officials, contractors, architects, and designers of metal buildings. A total of five webinars were held in 2011 and additional sessions are scheduled in 2012.

Webinar: Fire Code Compliance for Metal Building Systems

The Fire Code Compliance webinar was developed by MBMA's Committee on Fire Protection and Related Insurance Matters and Hughes Associates Inc. Webinars took place in November, 2011 and were led by Dan J. Walker, P.E., Senior Staff Engineer for MBMA, and Nestor Iwankiw, Ph.D., Senior Engineer, Hughes Associates Inc.

As fire resistance requirements for building construction continue to become more complicated with each new edition of the codes, MBMA is working to stay ahead of these requirements and educate both members and those who work with metal buildings. New materials, such as foam plastics and higher levels of insulation will change the way buildings are designed and change code requirements. This webinar gives the attendees knowledge of building code requirements for fire protecting buildings and an advanced understanding of how to do so. It covers the IBC requirements for fire-rated construction, focusing on specific examples for metal building systems. MBMA's UL rated assemblies are also reviewed in detail, in addition to incorporating portions of the MBMA Fire Resistance Design Guide for Metal Building Systems. All registered attendees received a copy of MBMA's Fire Resistance Design Guide for Metal Building Systems.

Webinar: Energy Code Compliance for Metal Building Systems

The Energy Code Compliance webinar was developed by MBMA's



Energy Committee and led by Jay D. Johnson, LEED AP, Director of Architectural Services for MBMA, and Dan J. Walker, P.E., Senior Staff Engineer for MBMA.

This webinar was developed to educate the metal building designer, specifier, contractor or builder on how to navigate and to utilize today's energy codes and standards as they apply to metal building systems. Most municipalities have adopted, or are proposing to adopt, energy code standards, many of which are based on ASHRAE 90.1 and the International Energy Conservation Code (IECC). The webinar introduces attendees to these codes and what to focus on when designing and constructing metal buildings. Attendees receive MBMA's Energy Design Guide for Metal Building Systems, the most complete resource available on energy efficiency for metal building systems.

MBMA Manuals and Design Guides

Along with Concrete Masonry Walls for Metal Building Systems, MBMA continues to offer all of its most recent manuals and design guides through the MBMA bookstore at www.mbma.com/bookstore. These publications include the industry standard, the 2006 Metal Building Systems Manual and its most recent update, the 2010 Supplement to the Metal Building Systems Manual. Other design guides include:

- Fire Resistance Design Guide for Metal Building Systems
- Energy Design Guide for Metal Building Systems
- Metal Roofing Systems Design Manual
- Seismic Design Guide for Metal Building Systems, published jointly with the International Code Council (ICC).

As new information becomes available and changes are made to all of these guides, updates are provided in MBMA's online bookstore.

- Guide Specifications: Metal Roofing Systems: It too may be edited to fit the conditions of use.
- The Solutions Series: A set of brochures which describe the advantages of metal building systems in specific applications.
- Cool Metal Roofing Brochure
- Galvalume Brochure

Receive these at 2012 webinars.
View presentation dates at
www.mbma.com/bookstore.

Free Educational Resources

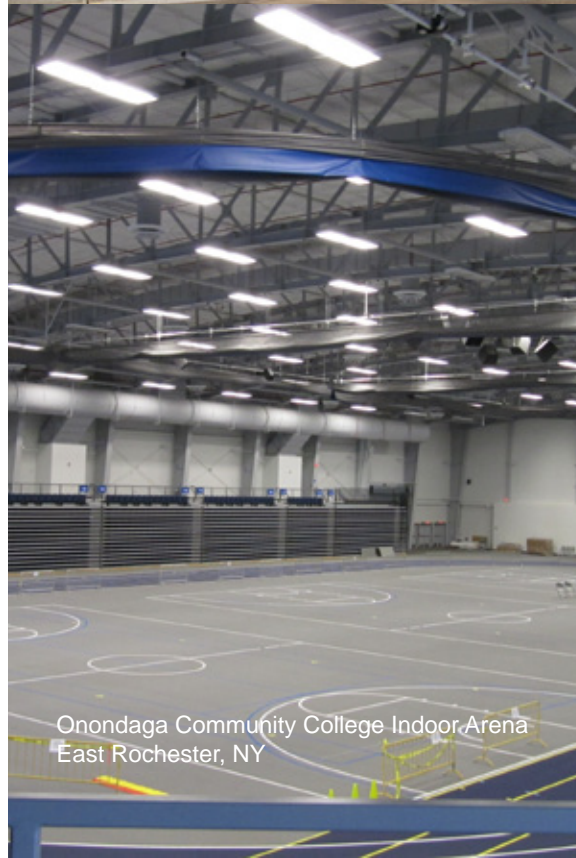
In addition to the manuals, design guides, and webinars, MBMA has a host of free educational resources available on the association's website. Many of these publications were previously available for purchase. In 2011, MBMA re-purposed many valuable educational materials to allow them to be viewed as free, online downloads. This effort exemplifies the association's commitment to providing broad-based education to the industry and to those who seek to enhance the reputation and perceived value of the metal building alternative. Available items include the following:

- Insurance Fact Book and Series of 14 Bulletins
- Fire Resistance Bulletins and Head-of Wall Information
- AIA Architectural Reprint: An Integrated Design Approach Offers Flexibility, Economy, Durability (provides an evaluation of metal building systems).
- Case Studies: New Corporate Headquarters is Paradise by the Bay; Steel Rolling Mill Rises from Former Swamp, and Trucking Company Consolidates Operations.
- Condensation Fact Sheet
- Guide Specifications: Metal Building Systems: A performance-based guide specification, which may be edited to fit the conditions of use.



Pure Energy, Minot, ND

Photo by Paddock Productions



Onondaga Community College Indoor Arena
East Rochester, NY



Custer Elementary School Custer,
Custer, South Dakota
Photo provided by: J. Scull Construction Services

Committee Achievements

Energy Committee



Dave Evers,
Committee Chairman

Energy Committee Mission

To promote the use of metal building systems in the non-residential construction industry by encouraging fair and equitable treatment of metal building systems by energy codes, standard organizations, testing and rating groups, and other governmental and non-governmental groups.

MBMA's Energy Committee had a busy 2011, focusing on three key areas:

- Energy codes and standards
- Education and training
- Research and innovation.

Energy Codes and Standards

The Energy Codes & Standards Task Group coordinates and directs MBMA's work on future code and standard requirements. In 2011, this group focused on:

- The ASHRAE 2010 standard and proposed addendums
- The International Energy Conservation Code which is adopted by most states.
- A draft update to the California Title 24 Code, which is available for public review

In addition to its work ensuring that current and future codes are relevant, MBMA continues to serve as an active member of the Cool Metal Roofing Coalition and in 2011 joined the National Association of State Energy Officials (NASEO) whose goal is the education of state code officials, and promotion adoption and enforcement of the IECC. It offers MBMA the opportunity to stay in touch with state-level code activities as well as to give input into the training and education of state officials regarding metal building systems and their energy code compliance options.

Education and Training

Beyond the Energy Code Compliance for Metal Building Systems webinar mentioned above, the Energy Committee also developed

a full day seminar entitled Energy Code Compliance Toolkit for Metal Building Systems. This is an in-depth training on various code compliance paths with an emphasis on using ComCheck software, a free program provided by the DOE, which can be used in 45 states to assure energy code compliance.

In the coming year the Energy Committee will also provide centralized information sources for MBMA members and also expand the sustainability section of www.mbma.com to include information relevant to owners, specifiers, architects, and energy officials.

Research and Innovation

Energy-related research in 2011 addressed the following:

- ORNL Flexible Research Platform: This multi-year project was started in 2011 and requires construction of a full-scale, 40-ft x 60-ft metal building. The goal is to evaluate the actual in-place performance of a building and establish cost-effective building designs that have a significant impact on the total energy consumption.
- ORNL Hot Box Testing: This is a joint project with ORNL to conduct hot box testing on 10 metal building assemblies. To date, six roof assemblies have been tested and the remaining four tests will be completed for walls and wall assemblies.
- Air Infiltration Task Group: A task group was established to evaluate the air infiltration performance of metal buildings and explore ways to make system improvements. Six tests were completed at the National Association of Home Builders Research Center, with additional testing for corners, edges, and discontinuities planned for 2012.



Sustainability Committee



Brad Robeson,
Committee Chairman

Sustainability Committee Mission:

The MBMA Sustainability Committee was formed in 2009 to represent the metal building industry in the many facets of green and sustainable construction and to ensure fair and equitable treatment for metal buildings by the many groups which publish standards relating to green construction.

2011 Overview

MBMA's Sustainability Committee is pursuing major innovative objectives that will impact the low rise non-residential construction market. It is positioning metal buildings as a premier green construction alternative and educating MBMA members about sustainable building in general. To achieve this mission the committee developed two working groups: The High Performance Green Building Task Group and the Life Cycle Impact/Life Cycle Assessment (LCI/LCA) Task Group.

Life Cycle Impact/Life Cycle Assessment Task Group

Life cycle assessment (LCA) is a holistic and systematic method for analyzing the environmental and human health impacts of a product or process. MBMA's LCA Task Group is taking significant steps to determine the LCA of metal building systems.

The task group commissioned a premier LCA consulting firm and has been working with them to gather and to compile life-cycle inventory data that will be used to complete an LCA for metal building systems. The study will adhere to the International Organization for Standardization (ISO) standards: ISO 14040 to establish the framework of the LCA process, and ISO 14044 which provide guidelines for the actual analysis and peer review. Once complete, the task force and committee will be able to oversee the incorporation of data into the ATHENA® Impact Estimator and the ATHENA® EcoCalculator as well as into the US LCI database.

High Performance Green Building Task Group

The High Performance Green Building Task Group influences the development of green and sustainable construction codes and standards. Voluntary programs are expanding and being adopted by various entities, while municipal programs are being instituted across the country at all levels of government. There is also an ongoing push for national green building codes and standards

that are adoptable and enforceable, such as ASHRAE 189.1 and IgCC 2012. The task group will monitor and influence these groups and represent the metal building systems industry.

2012 Goals

For 2012, the Sustainability Committee adopted three major goals:

1. Develop the Life Cycle Assessment Report and Life Cycle Inventory Population
2. Develop a benchmark LCA tool
3. Develop the Metal Building Systems Solution Path in Athena Impact Estimator

Achieving these goals will further position metal building systems as an optimal green and sustainable building choice.



Onondaga Community College Indoor Arena
East Rochester, NY

Fire Protection & Related Insurance Matters Committee



Bob Hodges,
Committee Chairman

Fire Protection & Related Insurance Matters Committee Mission

To promote the use of metal building systems in the non-residential construction industry by encouraging fair and equitable treatment of metal building systems by regulators, fire and building codes, insurance and insurance regulating and rating organizations, underwriters, and re-insurance firms.

2011 was a very busy year for the Fire Protection Insurance Matters Committee as it provided the most up-to-date information for the metal building systems community through the following projects:

- MBMA Fire Resistance Guide for Metal Building Systems: MBMA is carrying the design guide to the marketplace with MBMA website information, promotions in magazines and at trade shows, and the development of formal training programs.
- Fire Code Compliance Webinar Training Program: The Fire Code Compliance Webinar Training Program was developed by MBMA and Hughes Associates Inc. with two webinars taking place in 2011 and more to come in 2012.
- MBMA One-Hour Fire Rated Wall Test Program: In 2011, the committee completed the one-hour fire rated wall assembly listing with Underwriter's Laboratories (UL Listing W404) and informed members and the larger community of the listing through a number of efforts, including:
 - Fire Resistance Bulletin 5
 - MBMA one-hour rated assembly presented in Fire Protection Webinar

- News of the listing in trade magazines and online publications
- MBMA Two-Hour Fire Rated Wall Test Program: Two-hour fire-rated wall assemblies are required in certain buildings and the committee started developing the research plan which will include small-scale testing at Hughes Associates' facility in Baltimore, Maryland. Full-scale tests with Underwriters Laboratories are expected in the first quarter of 2012 and the proposed listing will provide an extension of MBMA's new W404 listing.
- MBMA Head-of-Wall Fire Test Program: The 2012 IBC code includes MBMA-sponsored changes that recognize and allow intersecting joints between fire resistive wall and non-fire resistive roof assemblies.

Committee Focus

In 2012, the committee will test the two-hour fire-rated wall assembly and commence one-hour rated roof assembly feasibility studies. Additional efforts will focus on the fire code compliance webinar training program and member education about significant changes related to fire and insurance issues.

Webinars and Design Guides



In 2011, MBMA developed webinars that highlight two important design guides, the Energy Design Guide for Metal Building Systems and the Fire Protection Design Guide for Metal Building Systems. These webinars ran in the final quarter of 2011 and additional sessions are planned for 2012. Registered attendees for the webinars received a copy of the respective design guide.

Safety Committee



Tom Wrigley,
Committee Chairman

The MBMA Safety Committee is the association's newest committee, formed in 2009. It has developed a set of principles that encourage safety mindedness in the workplace.

The committee mission is to put the following six principles into practice:

MBMA Safety Principles

1. All injuries and work-related illnesses can and must be prevented.
2. Leadership is responsible for clear safety objectives. All employees are responsible and accountable for working safely.
3. Employee engagement and training is essential.
4. Working safely is a condition of employment.
5. Excellence in safety and health drives excellent business results.
6. Safety and health is integrated into all business management processes.

Working to keep MBMA members apprised of the latest workplace safety information, the Safety Committee's recent accomplishments include:

- Revising and implementing the MBMA Safety Awards program
- Implementing a secure MBMA safety portal on the MBMA website
- Holding a successful annual safety conference

Safety Committee Meeting

The Safety Committee's annual conference took place in August 2011 in Houston, TX, with 41 professionals in attendance. The meeting included two plant tours and the following presentations:

- Steel Manufacturers Association Safety Program History – presented by Ronald Herring, CSHO, Safety Manager, Gerdau Midlothian
- Risk Management, Safety and Plan Development - presented by Scott B.

Lassila, CSP, CSM, APS, VP AON Global Risk Consulting

- EPA Regulation Update- Visible Emissions (Zero Opacity) – presented by Christopher Brodnick, Business Manager, Environmental Products Group, Lincoln Electric
- OSHA Updates/Changes That Will Impact the Metal Building Industry – James Shelton, OSHA Compliance Officer, Houston, TX.

Each of these presentations is available for members to view and download on MBMA's safety web portal. Others wishing to view the presentations should contact Charles Praeger at (216) 241-7333.

Safety Priorities

The Safety Committee's top priorities include:

1. Identify and share best practices
2. Engage employees in safety initiatives to assure sustainable results
3. Assure senior management support to underscore the value of safety initiatives.
4. View cultural change as part of the company banner and not a weekly event.

As part of the Change the Culture priority, MBMA revised its Safety Awards program for 2010. The new program toughened the criteria for recognition and made the awards based on the calendar year. As a result, the 2010 MBMA Safety Awards were presented at the MBMA Spring Meeting. Thirty-six awards were presented and five plants earned the top recognition, Superior Overall Safety Record.



Thrifty White Pharmacy,
Alexandria, MN
C.I. Construction, LLC
Photo by Paddock Productions



Indigo Plaza, Alexandria, MN

Innovative Builders

Photo by Paddock Productions

Safety Web Portal

The Safety Website Task Group spearheaded an effort to design and create a web portal for safety information within the MBMA website. Its purpose is to provide safety ideas and communications among the membership; share best practices; post OSHA/audit results; link educational resources, such as conferences and training links; and, house a resource library for best practices and safety facts. The safety web portal was developed in the first quarter of 2011 and introduced to members in April, 2011.

Future Plans

Moving forward, the Safety Committee will provide MBMA members more cutting edge tools, information, and practices related to safety. The committee has located a risk management company, with metal building industry expertise, and is collaborating with them to locate and to find pertinent and relevant information to assist in this strategy.

Technical Committee



Gerald Hatch, P.E.,
Committee Chairman

The MBMA Technical Committee serves a vital role within MBMA and for the industry as a whole as it keeps MBMA and its members at the forefront of technological advances within the engineering community. The Technical Committee's 2011 projects involved the following studies:

- Full Scale Wind Loads on Overhead Doors
- Flexural Strength of C and Zs with Rigid Insulation
- Shear Strength of Tapered Members
- Flange Brace Research
- Base Plate Wizard
- Seismic Behavior of Metal Building Frames
- BSSC PUC Flexible Diaphragm

Full Scale Wind Loads on Overhead Doors

MBMA has been studying roll-up doors used in metal buildings since Hurricane Katrina. Researchers at Virginia Tech have developed a model to predict door deflection given wind pressure, initial wind lock gap, and jamb flexibility. In 2009 a typical metal building jamb arrangement was tested and in 2011 two modified jombs were tested: one jamb had a stiffener at each girt, which helped preserve the jamb during testing but did not add significant stiffness, while the other jamb did a better job of engaging the girts to resist twisting of the jamb. The stiffness of this jamb was six times higher than the typical door jamb and was able to resist 200 psf before the assembly failed. The final report is expected in 2012.

Flexural Strength of C and Zs with Rigid Insulation

Rigid board insulation placed between R panels and girts or purlins require the use of bridging. This research is aimed at documenting the performance of this system without bridging. Base testing has been completed for through-fastened panels with rigid board insulation. The R values for design are low and it is anticipated that discrete point bracing would be used rather than R values. Other economical alternatives to base testing are under investigation at Virginia Tech and more information and testing is expected in 2012.

Shear Strength of Tapered Members

The method used to determine shear strength of tapered members has been around, at least since 1968 when Omar Blodgett published the concept. The committee's recent work in this area is focused on testing 12 specimens of varying geometry to obtain objective evidence to corroborate

the testing method. Testing, completed in 2011 for the 12 specimens, confirmed that the modified shear approach is conservative and requires an updated approach.

Flange Brace Research

Researchers at Georgia Tech have been studying flange brace strength and stiffness requirements for several years and have demonstrated that the strength and stiffness requirements for flange braces used in metal building systems are different than those developed for conventional steel construction. Several reports have been generated that quantify behavior, though the methods developed are complex. For production work it is proposed that a flange brace tool be developed that will allow the R&D departments to generate rules for the strength and stiffness requirements of flange braces, or that the flange brace tool can interface with production design programs. Development of this tool will begin in 2012.

Base Plate Wizard

Recent lateral drift measurement of a metal building and seismic behavior testing has shown that frame base stiffness has a larger than anticipated impact on design. Virginia Tech is developing a base plate wizard that can be used to determine the spring stiffness of frame base plates in metal building systems. With this tool it will be possible to design frames with better accuracy, taking advantage of the base plate stiffness for wind load deflection controlled buildings.

Seismic Behavior of Metal Buildings

The goal of this project is to update the building codes with more appropriate seismic design methods for tapered member rigid frames. In 2011, the committee worked to understand the code requirements with the help of a peer review committee. We have also been studying the behavior of the frames that were tested at UCSD. Further, we have charted a course for our FEMA P695 analysis. We are required to understand where the first damage (location of energy dissipation) will be in our frames and prepare a design approach that will guarantee that the energy dissipation and subsequent distortion will occur in this spot. The analysis of FEMA P695 will take place in 2012. Component testing is necessary in 2012 to better understand the behavior of the energy dissipation for modeling purposes.

BSSC PUC Flexible Diaphragm Research

Research has been performed in the last 10 years that documents the behavior of buildings with flexible diaphragms and concentrically braced frames. The flexible diaphragm dominates behavior for these buildings and the effect is to increase the building period which reduces the seismic demand on the building. This has the potential to reduce the demand on our building longitudinal bracing (fewer struts) and the possibility of using roof diaphragms in higher seismic areas.

Resources

MBMA's seminal publication, the Metal Building Systems Manual, is being updated by the Committee to include the 2012 IBC with many other enhanced features with the intention to be published in 2012. In addition we are currently reviewing and revising the Metal Roofing Systems Design Manual.



MBMA expects to complete work on the latest revisions to these vital industry publications in the coming year.



MBMA Members and Associate Members

MBMA MEMBERS

A & S Building Systems Inc.
An NCI Company
Caryville, TN
www.a-s.com

ACI Building Systems, Inc.
Batesville, MS
www.acibuildingsystems.com

Alliance Steel Inc.
Oklahoma City, OK
www.allianceokc.com

American Buildings Co.
A Nucor Company
Eufaula, AL
www.americanbuildings.com

BC Steel Buildings, Inc.
Oklahoma City, OK
www.bcsteel.com

Behlen Building Systems
Columbus, NE
www.behlenbuildingsystems.com

Bigbee Steel Buildings, Inc.
Muscle Shoals, AL
www.bigbee.com

BlueScope Buildings North America,
Inc.
Kansas City, MO
www.bluescopesteel.com

Butler Manufacturing
A Division of BlueScope Buildings
North America, Inc.
Kansas City, MO
www.butlermfg.com

CBC Steel Buildings
A Nucor Company
Lathrop, CA
www.cbsteelbuildings.com

Ceco Building Systems
An NCI Company
Columbus, MS
www.cecobuildings.com

Chief Buildings
Grand Island, NE
www.chiefbuildings.com

Chisum Site & Steel, Inc.
Paris, TX
www.chisumsteel.com

Dean Steel Buildings, Inc.
Fort Myers, FL
www.deansteelbuildings.com

Garco Building Systems, Inc.
An NCI Company
Airway Heights, WA
www.garcobuildings.com

Golden Giant, Inc.
Kenton, OH
www.goldengiant.com

Gulf States Manufacturers
A Nucor Company
Starkville, MS
www.gulfstatesmanufacturers.com

HCI Steel Building Systems
A Division of BlueScope Buildings
North America, Inc.
Arlington, WA
www.hcisteel.com

Heritage Building Systems
An NCI Company
North Little Rock, AR
www.heritagebuildings.com

Inland Buildings
Cullman, AL
www.inlandbuildings.com

Kirby Building Systems, Inc.
A Nucor Company
Portland, TN
www.kirbybuildingsystems.com

Liberty Building Systems
A Division of BlueScope Buildings
North America, Inc.
Memphis, TN
www.libertybuildings.com

Ludwig Buildings, Inc.
Harahan, LA
Mesco Building Solutions
An NCI Company
Irving, TX
www.mescobuildingsolutions.com

Metallic Building Company
An NCI Company
Houston, TX
www.metallic.com

Mid-West Steel Buildings
An NCI Company
Houston, TX
www.mid-weststeel.com

NCI Building Systems, Inc.
Houston, TX
www.ncilp.com

Nucor Building Systems
A Nucor Company
Waterloo, IN
www.nucorbuildingsystems.com

Oakland Metal Buildings, Inc.
Florence, AL
www.oaklandmetalbldgs.com

Package Industries, Inc.
Sutton, MA
www.packagesteel.com

Pinnacle Structures, Inc.
Cabot, AR
www.pinnaclestructures.com

Red Dot Buildings
Athens, TX
www.reddotbuildings.com

Robertson Building Systems
An NCI Company
Ancaster, Ontario, Canada
www.robertsonbuildings.com

Ruffin Building Systems, Inc.
Oak Grove, LA
www.ruffinbuildingsystems.com

Schulte Building Systems, L.P.
Hockley, TX
www.sbsp.com

Spirco Manufacturing
Memphis, TN
www.spirco.com

Star Building Systems
An NCI Company
Oklahoma City, OK
www.starbuildings.com

Steel Built Corp.
Ambridge, PA
www.olympiabuildings.com

Trident Building Systems, Inc.
Sarasota, FL
www.tridentbuildingsystems.com

Tyler Building Systems, L.P.
Tyler, TX
www.tylerbuilding.com

United Structures of America, Inc.
Houston, TX
www.usabldg.com

Varco Pruden Buildings
A Division of BlueScope Buildings
North America, Inc.
Memphis, TN
www.vp.com

Vulcan Steel Structures, Inc.
Adel, GA
www.vulcansteel.com

Whirlwind Steel Buildings, Inc.
Houston, TX
www.whirlwindsteel.com

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1300 Sumner Avenue
Cleveland, OH 44115-2851
Phone: (216) 241-7333
Fax: (216) 241-0105
Internet: www.mbma.com
Email: mbma@mbma.com