MBMA
METAL BUILDING MANUFACTURERS ASSOCIATION

50th Anniversary

COLLECTOR'S EDITION | JULY 2006

A Supplement To Metal Construction News & Metal Architecture

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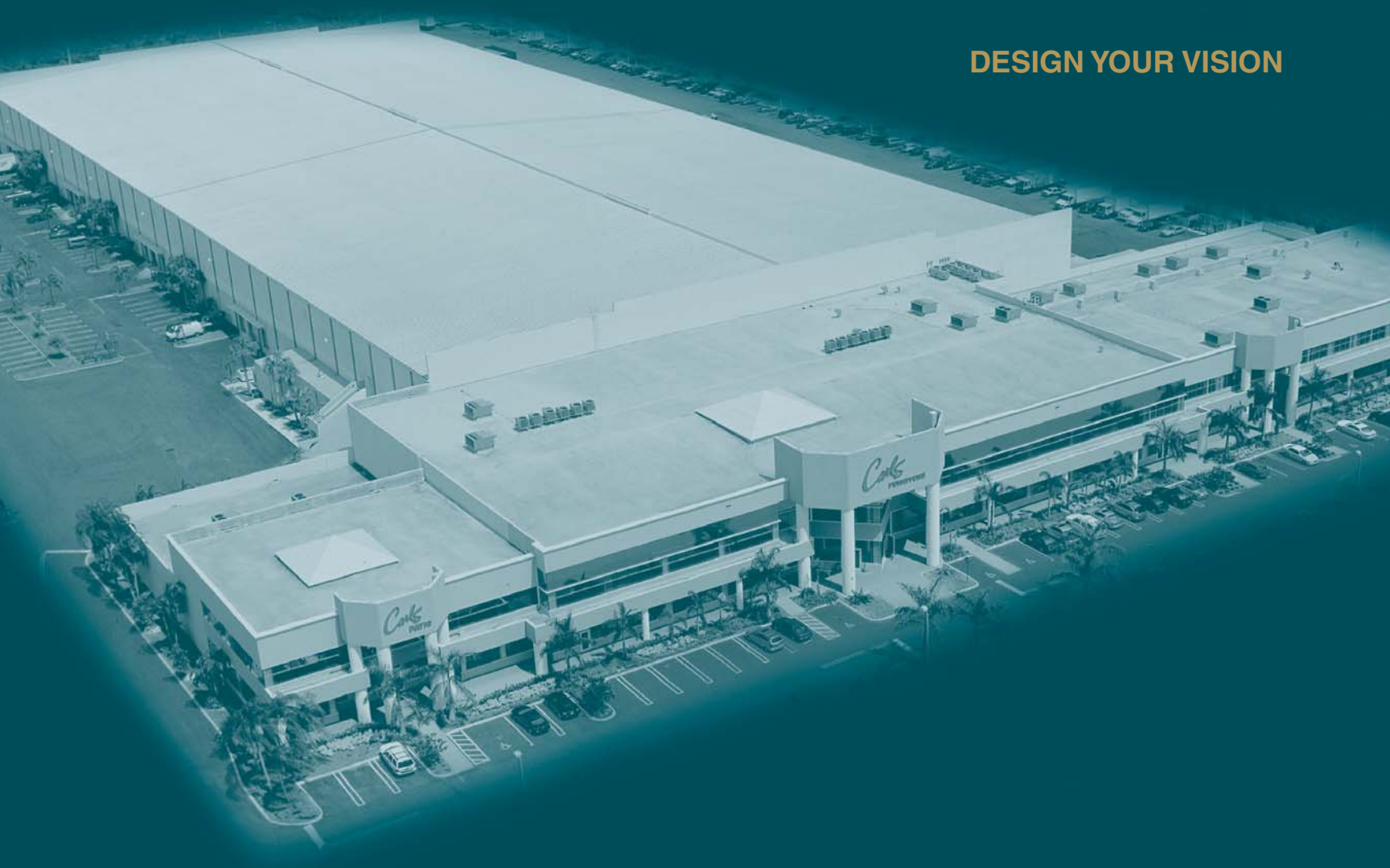

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MBMA HITS 50... AND IT'S BETTER THAN EVER!

In 1956, 13 metal building system companies joined forces to create the foundation for the Metal Building Manufacturers Association (MBMA). Now, 50 years later, the association's membership has increased to over 55 companies, including metal building manufacturers and associate members. Through the efforts of its members, MBMA has influenced and forever changed the metal building systems industry through the many research and lobbying activities that have positively influenced codes and specifications - and public opinion.

Metal building systems have dramatically changed in five decades and MBMA has been instrumental in the industry's evolution every step of the way. In recognition of the association's 50th year of service to the metal building systems industry, the following pages focus on their past, present and future, and on its members who make MBMA successful. *Enjoy!*

MBMA MISSION

To enhance the collective interests of the metal building systems industry.

MBMA PLEDGE

To represent and promote the common interests of the member companies and wisely invest their resources to benefit the group.

MBMA ONLINE

www.mbma.com

MBMA CONTACT

Did this 50th anniversary insert give you new insights, raise new questions, or pique your interest in the industry? If so, learn more from the leaders. Call, write, or email:

Metal Building Manufacturers Association
1300 Sumner Ave • Cleveland, Ohio 44115
(216) 241-7333 • cpraeger@taol.com

MBMA is Today's Industry Change-Agent

"American business is undergoing systemic, rapid and dramatic change," said Chuck Praeger, MBMA's assistant general manager. "That's one issue that makes MBMA so crucial today." MBMA is the only association dedicated to engineering and technical issues, research, codes and standards, insurance and fire ratings, and enhancing the energy efficiency of the building envelope for the low-rise construction market. Consequently, their services are vital to assuring the industry's leadership position in the construction industry. "We are focused on growing our industry and its position, and repelling threats from changing market conditions," added Praeger.

MBMA's efforts to challenge and protect the industry are multi-faceted. One initiative is the production of a series of flyers to educate significant audiences about the purpose and value of AISI-MB certification.

MBMA developed the original AISC-MB Certification program to build customer confidence that the companies providing their buildings had been subjected to rigorous engineering and fabrication audits. This helped enhance the image of the industry because manufacturers were now subject to third-party inspection. The AISC-MB Certification program became the industry's official recognition source for validating quality and integrity for companies willing to face the rigors of the certification process. The certification program is administered by the American Institute of Steel Construction and MBMA, who not only serves as program developer to create continuous improvements, but helps to assure that certification becomes a requirement of building specifications.

The AISC-MB Certification program is the most comprehensive quality certification program of its kind and validates that manufacturer have sound processes and demonstrated capability to provide high-quality, reliable buildings.

Unlike many other certification programs that do not audit the integration of design engineering with manufacturing processes, the AISC-MB Certification Program has several key areas of focus, including:

MBMA's series of certification flyers are offered for various audiences, including code officials, building owners, contractors, national accounts and specifiers. Tens of thousands of these flyers have been ordered by metal building systems manufacturers to distribute to their target audiences.

- Audit of order documents. It is important that the customer is provided with clear information on what he/she has ordered.
- Audit of the design/detailing process for adherence to requested codes are being met in a rational engineering manner. This area not only covers the building code applications but also the proper use of design standards such as AISC, AISI, etc.
- Audit of raw material usages including proper ASTM standards, ordering practices, tracking of mill certifications, etc.
- Audit of manufacturing practices including machinery calibrations, measuring tools, weld certifications, etc.

This is all verified with on-site inspections to confirm that the appropriate standards are in place and being applied on representative projects.

MBMA MAKES UNPRECEDENTED MOVE

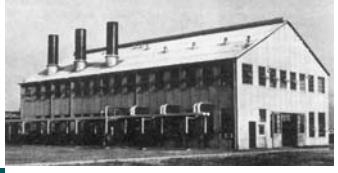
AISC-MB Certification is a core value to MBMA members. That's why the association's by-laws state that all building system manufacturers must be certified through the AISI-MB program. In an effort to raise the quality level of the entire metal building systems industry, at the January 2006 MBMA board meeting, the leadership agreed to make an unprecedented change and invite non-certified manufacturers who would commit to getting certified to participate in the association. However, the change includes significant caveats.

An uncertified manufacturer, who otherwise meets the requirements for membership, can join the MBMA under a special program designed to help that manufacturer become certified in a far less costly and more timely manner than if they tried to do it without the association's support. "We understand that obtaining this coveted accreditation is a challenge for many new or smaller companies," said Praeger "And understanding how difficult the certification challenge can be, we'll provide mentoring and peer assistance and process templates to help firms to achieve accreditation within three years."

MBMA SUPPORTS TMI

"The Metal Initiative (TMI) is acting as another reputable voice for our industry," said Charles Stockinger, general manager of MBMA. "We decided to support it, because TMI is educating owners, architects and contractors about the value and long-term benefits of metal in the commercial roof and wall market. This aligns with MBMA's continuing efforts to increase information and understanding about metal roofing and wall systems so that building owners and architects can make more informed buying decisions."

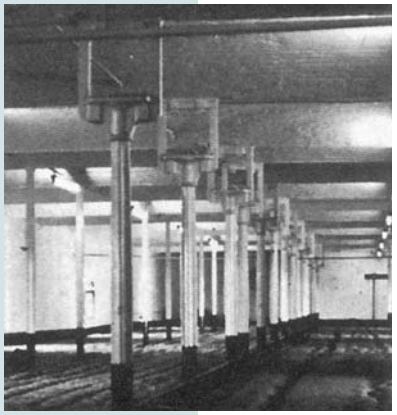
MBMA joined forces with TMI in January, 2006 and will hold a position on TMI's executive board.



How It All Began - An Industry Retrospective

1700S:

The world's first iron-framed building was the Ditherington Flax Mill in Shrewsbury, England, which is now Shropshire Maltins of Albrew Malsters Ltd. The building, designed by Charles Bage, was erected alongside Shrewsbury Canal between September 1796 and September 1797. The Ditherington mill is 177'3" long and 39'6" wide.



1800S:

In the mid-1800s during the California Gold Rush, Peter Naylor, a metal roofer from New York, advertised "portable iron houses for California." The advertisement told how the iron was grooved so all parts of the house, roof and sides could slide together. According to an ad, a 20' x 15' house could be erected in less than a day, was much cheaper than wood, was fireproof and was more comfortable than a tent. The house could be shipped in two boxes, each 12' long, 2' wide and 8" deep—all for about $14 in freight costs to San Francisco. Between 500 and 600 of the "iron houses" were shipped out in 1849. A 60' model could be purchased for as little as $200. One of Naylor's houses, purchased for $345, sold in California for $5,000.

EARLY 1900S:

During the early 1900s, metal structural members and panels were used for garages. Small structures were advertised in the Saturday Evening Post in 1916, selling for about $66.

Metal building systems were next used in oil fields. Four or five companies made buildings that had metal structures with walls and roofs of corrugated steel panels.

In the early 1920s, an ad placed by Chicago-based Liberty Steel Products Company, pictured a fabricated steel building,

shipped from the factory and ready to erect in a matter of hours.

An industry first was the introduction by Armco Steel Corp. of a pre-engineered standing seam metal roof at the 1934 Century of Progress Exposition in Chicago.

The pre-engineered building business really prospered during World War II with the evolution of the Quonset Hut, which was portable, inexpensive and easy to erect. The huts were used for barracks, hangars and other service end uses. Stran alone shipped over 200,000 Quonset Huts during the war.

When the war was over, steel buildings were in great demand. The only limitation was availability of steel. Many companies that had been in business prior to the war returned.

THE 1950S AND '60S:

Industry advances during the mid-1950s included the introduction of a straight, sidewall panel for commercial and industrial buildings, and the introduction, by Stran, of color coated panels.

This decade also saw manufacturers begin to do business through a builder/dealer network. These builders provided combined general contracting and erection services, and MBMA manufacturers began to offer training courses.

In the early 1960s the pre-engineered metal building industry continued to prosper as there was a high demand for buildings that erected quickly, performed well and were affordable.

However, buyers were being influenced more by the local builder's reputation rather than the manufacturer's reputation. Promotional campaigns were mounted by manufacturers to build brand identification and, soon, advertising and merchandising programs started to pay for themselves.

The typical end product at this time was under 10,000 sq. ft. and in 1960, agricultural users accounted for 34% of total MBMA shipments. The remaining 66% went into commercial, industrial and other uses.

MBMA member sales grew from $69.6 million in 1956 to $98.9 million in 1960. Steel shipments were in the range of 260,000 tons. Market share was 20% of low-rise, non-residential construction. MBMA had 16 members with 23 plants, and a total of 1,000 dealers.

In 1968, the Metal Building Dealers Association (later renamed Systems Builders Association) was formed with Jim Studinski as its first president.

1970S:

By 1970, MBMA had grown to 25 members with 40 plants, and the number of builders/dealers had tripled to 3,000. End use of products was: commercial and industrial, 36% each; agricultural, 10%; community, 8%; and miscellaneous, 10%.

Manufacturer sales in 1970 were $363 million. Steel shipments grew to 659,000 tons and market penetration in the low-rise, non-residential segment of construction increased from 20% to 30%

During the decade, millions of dollars were invested by manufacturers and MBMA to develop product features, increase capacity and reduce the final product cost to the marketplace. The most significant product development was the standing seam roof system which is the finest roof system available today. In addition, sophisticated coating systems for roof and wall

systems were coming out on the market and improving the quality and appearance of metal buildings.

In 1974, MBMA formed a Mill Relations Committee with William Slaton Sr. of Delta Steel Buildings Company as chairman. Slaton was responsible for most of the work on MBMA's first Code of Standard Practices, issued in 1959.

By the end of the 1970s, the industry had captured 47% of all low-rise, non-residential construction in the United States.

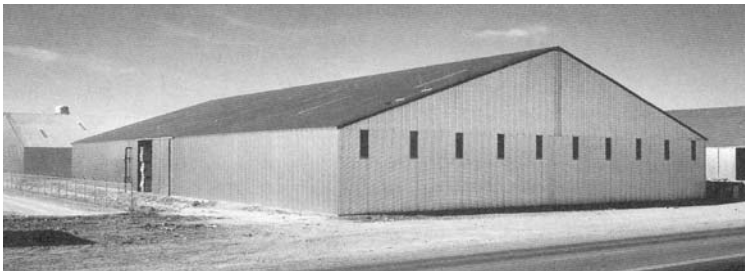
1980S:

MBMA sales in 1980 were over $1 billion dollars, compared to $323,000,000 a decade earlier. Member steel shipments were in excess of 1 million tons. In 1981, MBMA had 35 members operating 74 plants in the United States and 10 overseas. There were 8,800 independent dealer/builders.

The industry's first tabloid-size trade publication, Metal Building News, was published in 1980. The magazine's name was later changed, in the mid-'80s, to Metal Construction News.

In 1982, an attitudinal survey was used as the basis of a three-year communications program by MBMA's Marketing Communications Committee. Utilizing trade magazine publicity, direct mail and general news, the program aimed to alter certain perceptions of metal building systems. A follow-up survey in 1985 revealed some progress had been made toward improving the attitudes of architects, engineers and code officials about the appearance, design flexibility and energy efficiency of metal building systems.

In 1985 a second industry magazine was introduced: Metal Architecture, which is devoted to educating architects and building designers on the benefits of metal building systems and metal construction products, including metal roofing for new construction and retrofit.



Celebrating its 50th anniversary, MBMA serves the metal building systems manufacturers and associate member suppliers. Its membership represents more than $2.4 billion in annual steel shipments and accounts for approximately 40% of the total non-residential low-rise construction marketplace. MBMA provides engineering leadership through the many research programs that it sponsors annually. This research is used to improve the performance, efficiency and quality of metal building systems and to elevate the technology used to produce them.

"MBMA's proactive research and technical expertise have contributed to the industry's growth rate."

Chuck Praeger, MBMA assistant general manager

"The combined efforts of member companies have allowed the association to address both opportunities and threats in a unified manner."

Chuck Stockinger,
MBMA general manager

"If past market cycles continue and the MBMA continues to excel, industry shipments could well reach the 4,000,000 ton mark by the year 2035."

Lee Shoemaker,
MBMA director of research and engineering

"[After WW II] car dealers were anxious to get back into business again and Butler was anxious to get back into their varied business too, so we were looking for automobiles to put our salesmen back on the road and car dealers were looking for buildings to get back into business and in more than one case we would say to a car dealer, 'Fine, if you let us have one of your Chevrolets, we'll let you have a 40'x100' building.'"

Wilbur Larkin, as quoted in MBMA's 25th annual meeting handout.

MBMA - The First Year, 1956

The idea for an industry association was first conceived when Wilbur Larkin, of Butler Manufacturing, wrote to a number of companies, inviting them to a meeting May 24, 1956, at the Palmer House in Chicago. Attending were representatives from Armco, Behlen, Butler, Inland, Soule, Steelcraft, Stran-Steel, Metallic and Wonder.

This organizational committee met three more times and at a meeting September 25, 1956, 13 companies (with 16 plants) officially formed Metal Building Manufacturers Association (MBMA) with an effective date of October 1, 1956. Charter members—who each pledged $500 to get the association started—were Armco Steel Corp., Behlen Manufacturing, Butler Manufacturing, Carew Steel, Cowin & Company, Inland Steel, Martin Steel, Metallic Buildings, Pascoe Steel, Soule Steel, Steelcraft Manufacturing, Stran-Steel Corp. and Wonder Building Corp.

MBMA's first board of directors included: William T. Pascoe, Pascoe Steel; George L. Cobb, Soule Steel; C.R. (Charlie Mac) McDaniel, Metallic; Walter D. Behlen, Behlen Manufacturing; H.J. Carew, Carew Steel; C.V. Teeter, Cowin & Company Inc; William Mericle, Martin Steel; Charles Levinson, Steelcraft Manufacturing; Peter S. Pederson Jr., Wonder Building Corp.; Donald Malcolm, Armco; R.W. Sykes, Inland Steel; Charles Homer, Stran-Steel Corp.; and Larkin.

Cobb, Homer, Sykes, Larkin and Malcolm were elected to the executive committee, and Larkin was unanimously elected chairman of the board of directors. A monthly budget of $2,000 was approved. Committees were formed in the areas of statistics, insurance matters and product promotions.

MBMA Charter Members

(1956)

ARMCO INC.

Behlen Mfg. Co.

Butler Manufacturing Company

Carew corporation

Cowin & Company Inc.

Inland-Ryerson Construction Products Company/INRYCO INC.

Marathon Metallic Building Company

Martin Steel Buildnings Inc.

National Steel Products Company/Stran-Steel

Pascoe Steel Corporation

Soule' Steel Company

Steel Craft Manufacturing Company

Wonder Building Corporation Of America

MBMA - Distinguished Leadership

MBMA Chairmen

Leadership has been crucial to the association, and it has been afforded by the following who have served as chairmen of MBMA, during its first 50 years:

1956 & 1957—Wilbur Larkin, Butler Mfg. Co.
1958—Donald Malcolm, Armco Inc.
1959—George Cobb, Soule Steel Company
1960—Charles Homer, National Steel Products Co.
1961—Howard Carew, Carew Corp.
1962—Harry Williams, Braden Steel Corp.
1963—C.L. Mitchell, Mitchell Engineering Co.
1964—Donald Malcolm, Armco Inc.
1965—William Slaton, Delta Steel Buildings Co.
1966—James Dennis, Atlantic Building Systems
1967—C.V. Blackburn, Pascoe Steel Corp.
1968—Jack Hatcher, Varco-Pruden
1969—John Von Blon, A&S Building Systems
1970—R.J. Atkinson, Butler Mfg. Co.
1971—Lon Shealy, Star Manufacturing Co.
1972—Gilbert Leach, Marathon Metallic Building Co.
1973—James D. Murphy Jr., American Buildings Co.
1974—John Reigle, National Steel Products Corp.
1975—Lou Barrenechea, Pascoe Steel Corp.
1976—Hugh McCarley, Atlantic Building Systems
1977—Scott Lewis, Braden Steel Corp.
1978—R.J. Atkinson, Butler Manufacturing Co.
1979—Robert C. Kelley, Varco-Pruden
1980—Charles H. Waldron, Mitchell Engineering Co.
1981—James L. Sullivan, Inryco Inc.
1982—Herman J. Oellerich, Armco Atlantic Inc.
1983—Donald H. Pratt, Butler Mfg. Co.
1984—Talmage G. Rogers Jr., Ceco Buildings Div.
1985—Gary Heithecker, Mesco Metal Buildings Corp.
1986—James D. Murphy Jr., American Buildings Co.
1987—Norman Yerke, Summit Buildings
1988—Robert C. Kelley, AMCA Buildings Division
1989—Clayton Richardson, Gulf States Manufacturers
1990—George King, Kirby Building Systems
1991 & 1992—Richard Jarman, Butler Mfg. Co.
1993—Dan Zabcik, NCI Building Systems Inc.
1994—Duane Stockburger, Varco-Pruden Buildings
1995—Robert T. Ammerman, American Buildings Co.
1996—Tony Raimondo, Behlen Mfg. Co.
1997—George King, Kirby Building Systems Inc., Div. of ABS
1998—J. Terrell Landrum, Ceco Building Systems
1999—Harry R. Lowe, Nucor Building Systems
2000—Leonard George, NCI Building Systems
2001—John Underwood, The Behlen/Inland Group
2002—Joel Voelkert, American Buildings Co.
2003—Will Feland, Pinnacle
2004—John Price, Chief Buildings
2005—Harry R. Lowe, Nucor Building Systems
2006—Robert T. Ammerman, American Buildings Co.

The Road To MBMA's Technical Excellence

By W. Lee Shoemaker, P.E., Ph.D.
Director of Research and Engineering
Metal Building Manufacturers Association

The Metal Building Manufacturers Association holds a strategic planning session every two or three years, and the situational analysis invariably lists MBMA's technical leadership and reputation as key strengths of the association. Therefore, it would be appropriate, as we celebrate MBMA's 50th anniversary, to reflect on the journey taken to achieve this important distinction.

EARLY ORGANIZATIONAL MILESTONES

When founded, "MBMA's main purpose was to jointly attack technical matters that could not be accomplished by individual companies," according to the late James Murphy, former president of American Buildings Co. and former MBMA chairman. Therefore, it was no surprise that, at MBMA's first annual meeting on December 4, 1956, the formation of a Technical Committee was one of the top priorities.

The MBMA Technical Committee first met on April 18, 1957 in Chicago, IL with nine member companies in attendance: Armco, Butler, Carew, Cowin, Inland, Metallic, Steelcraft, Stran, and Wonder Building. Robert Blickensderfer of Armco, affectionately known as "Blick", served as chairman of the Technical Committee until 1962. Also in attendance were Butler representatives Wilbur Larkin, the first chairman of MBMA, and Norm Rimmer who was chairman of the Technical Committee for a remarkable 10 year period, following Blick.

The first order of business for the new organization was to determine the common technical issues facing the industry and to collectively develop an action plan. It is an obvious challenge for competitors in the marketplace to come together in this fashion, but the founding members of MBMA really set the cooperative tone that would shape the group. Norm Rimmer, who is today 87, remembers that "We all realized that our main competition was other forms of construction. We just wanted a chance to bid on more projects because we knew we had a good solution."

One important task was to evaluate the application of design loads that varied considerably between codes. The Technical Committee looked at all the available research and data and combined this with their collective wisdom to eventually publish the influential state-of-the-art MBMA Recommended Design Practices Manual that sold for one dollar in 1959. However, it was apparent in assembling this first manual that MBMA would have to consider sponsoring new research to be able to advance the industry.

At a Technical Committee meeting early in 1960, it was agreed that MBMA would have to sponsor research that would serve as the basis for future recommendations. For the next few years, however, MBMA Technical Committee members provided their expertise on several ongoing projects sponsored by others. For example, the American Iron and Steel Institute (AISI) sponsored work at Cornell University that led to the publishing of Design of Light Gage Steel Diaphragms in 1967. This landmark publication acknowledges the cooperation of MBMA and the Steel Deck Institute in the research program. AISI also began sponsoring research at Cornell on purlin uplift capacity.

MBMA INITIATES SPONSORED RESEARCH PROGRAM

MBMA first co-sponsored a major research project in 1966. This project was a study on tapered structural members that was conducted at the State University of New York at Buffalo by Dr. George Lee. Other sponsors were the U.S. Naval Facilities Engineering Command, American Institute of Steel Construction (AISC), and AISI. A joint task committee of the Column Research Council (now the Structural Stability Research Council) and the Welding Research Council was established to facilitate the study. This began a 15-year MBMA association with Dr. Lee and his tapered member research that led to the notable book, Design of Single Story Rigid Frames, published by MBMA in late 1980.

Don Johnson, now a consultant who retired from Butler Manufacturing in 1996, and who was a two-term MBMA Technical Committee chairman, headed the MBMA subcommittee that helped guide this research. Johnson recalls that, "it was a very complex problem, requiring Dr. Lee to come up with a very complex solution; but this helped advance our knowledge of the behavior of tapered members, particularly with regard to geometric limits on the taper."

The ultimate goal with any research is to positively influence the building codes or material specifications. Supplement No. 3 was released in 1974 for the AISC Specification that added Appendix D on Tapered Members that was based on Dr. Lee's research. This validated the work and provided an optional method to the designer when tapered members are used. MBMA is currently sponsoring the development of an AISC/MBMA Tapered Member Design Guide, which will provide design practices that are consistent with the 2005 AISC Specification, but suited to today's computer methods of design.

DIRECTOR OF RESEARCH & ENGINEERING

In the mid 1970s, it became difficult to conduct the technical activities of MBMA solely with the volunteer manpower of the member companies. The board opened a search in 1974 to appoint a full-time director of research and engineering. According to Lyle Wilson, formerly with American Buildings and MBMA Technical Committee chairman from 1972 to 1974, "We were looking for someone with metal building industry experience and preferably, someone with a Ph.D. who would be able to help us with the research program."

Following a lead, Lyle Wilson and Pete Peterson, who was with Thomas Associates, met Duane Ellifritt in Tulsa to discuss the position. Dr. Ellifritt, who had been an engineer at Armco for ten years and was currently on the faculty at Oklahoma State University, jokingly remembers that "We met in a dry county, so it was a pretty sober meeting." But, the meeting must have gone well, because the position was offered, and when the timing was right for his family, Dr. Ellifritt came on board in June 1975.

This decision to hire a full time director of research and engineering came at an opportune time, as the wind research effort was being pulled together. Dr. Ellifritt became a key player in one of MBMA's most significant research undertakings. He served in this capacity until 1984, when he returned to academia at the University of Florida. He did an outstanding job of getting the organization moving forward with an aggressive research program and in serving as the industry technical spokesman and liaison for nine years.

Dr. Dale Perry, of the University of Idaho,

was hired to follow Dr. Ellifritt, serving in that capacity until 1988. Dr. Perry had been the principal researcher for an MBMA project on the thermal movement of roofs that involved field measurements at Garco's metal building plant in Spokane, WA.

Gill Harris became the third director of research and engineering in 1988 and brought many years of industry knowledge to the position, especially with his long involvement with wind engineering and standards. He worked with different metal building manufacturers over the years – mostly with Mitchell Engineering Company (now Ceco Building Systems). Instead of a Ph.D., Harris had a master's degree from Rice University, but he brought genius to the position, as documented by his Mensa membership.

Harris attended his first MBMA Technical Committee meeting, representing Mitchell Engineering, in 1962 after having worked on the wind load recommendations in the first MBMA Manual in 1957 while at Metallic. He went on to attend 97 MBMA Technical Committee meetings in addition to serving as chairman from 1975 to 1977. He is currently serving as a consultant to the industry by lecturing, testing, designing and providing wind damage investigations.

"It is a wonderful and gratifying experience to be associated with the metal building industry which has been willing to devote its resources to the advancement of wind engineering, in addition to other structural disciplines, not just selfishly but to the enhancement of the building codes and standards," said Harris

Harris retired from MBMA in 1994, and that is when I came on board. Then in 1996, recognizing the importance of additional full-time staff to complement the work of the volunteer members, MBMA hired a second engineer. Dan Walker, PE, has been a solid asset to the association in this role.

SIGNIFICANT RESEARCH CONTRIBUTIONS

There are many research accomplishments that advanced the state-of-the-art in metal building design, improved building codes and specifications, and established MBMA as a technical leader. The following are some of the more notable achievements.

Wind Load Research

In 1974, when the model building codes indicated interest in adopting the wind loads from the American National Standards Institute (ANSI) A58.1 Minimum Design Loads for Building and Other Structures (which became ASCE 7 in 1988), MBMA decided it was time to enact their plan to sponsor wind load research aimed at settling the differences in the various standards. Especially since the ANSI standard was completely based on testing of high-rise buildings and was inappropriate for low-rise applications. Until MBMA became involved, there was little concern about this from others. It is important to note that this was not just a metal building issue, it was a low-rise building issue, and the research had far reaching impact.

MBMA representatives, led by Stephen Jones of Cuckler Building Systems, met with two of the leading researchers in the field of wind load design at the world's best boundary layer wind tunnel programs. They were Dr. Jack Cermak of Colorado State University and Dr. Alan Davenport of the University of Western Ontario. Ultimately, it was decided that the University of Western Ontario was the best match in that UWO was already engaged in some related research on low-rise structures.

This pioneering work launched the first comprehensive investigation of wind action on low-rise buildings, which recognized both the importance of boundary layer flow and the action of turbulence. In 1976, additional sponsors joined the effort - AISI, and the Canadian Steel Industry Construction Council. The task of trying to codify the extensive database of wind tunnel results for low-rise buildings was a very difficult one. But this is where Dr. Davenport's UWO team and MBMA may have made their greatest contribution.

The hard work finally paid off, when the Standard Building Code (SBC) first adopted the wind loads developed by Dr. Davenport's team. This was included as an alternate procedure in the 1982 SBC, which was notable since this code governs the design of buildings along most of the hurricane coastline in the United States. Then, in the 1986 SBC, these provisions became mandatory for low-rise buildings because of the improved performance of buildings designed to these provisions. The American Society of Civil Engineers Standard, Minimum Design Loads for Buildings and Other Structures (ASCE 7) finally made revisions in their 1995 edition, introducing the UWO primary framing loads for low-rise buildings.

The wind load research was undoubtedly the most successful technical endeavor undertaken by MBMA. Harris reflects, "From MBMA's beginning in 1956 it has taken the lead in this field by using wind tunnel based designs while most of the engineering community was still practicing with wind on total vertical projection." In Dr. Ellifritt's annual report to the MBMA Board of Directors in 1979, he stated "It is the consensus of the Wind Subcommittee, the Technical Committee, and qualified professionals, that this research is a quantum leap in the knowledge of the action of wind on low rise buildings. If anyone questions the relevance or accuracy of this research, all that has to be done is review the damage caused by Hurricane Frederic in Mobile, AL this fall. Edge strip, corner strip, and end-frame loading were clearly demonstrated by the damage that occurred in buildings designed to previous standards."

MBMA is still on the wind engineering forefront today. In connection with the National Institute of Standards and Technology, MBMA is advancing the state-of-the-art in wind engineering design with the virtual wind tunnel, which is intended to give the designer the equivalent of a wind tunnel at the computer through a digital database.

Bolted End-Plate Connections

The metal building industry, with MBMA's leadership, pioneered the use of bolted end-plate connections in the United States. This was in large part due to the research program that established the design procedures that have been adopted for this type of connection. MBMA began sponsoring research in 1971, when Dr. Krishnamurthy of Auburn University was selected to conduct the study on bolted end-plate moment connections that was cosponsored by AISC. Dr. Krishnamurthy later moved on to Vanderbilt University and to the University of Alabama – Birmingham, but the MBMA research continued under his direction at those institutions as well.

The impetus for this research was a design example included in the 7th edition of the AISC Manual of Steel Construction, which would have required end plates at least twice as thick and bolts of larger diameter than those being used in metal building applications. This was because it was based on simplifed design assumptions and analyses of the connections.

Dr. Thomas Murray of the University of Oklahoma and Virginia Tech followed Dr. Krisnamurthy's work for MBMA in 1982 to develop a new approach aimed at unifying the design approach for the most common end-plate connections utilized in the industry. Comparisons of test data to his design theory proved that this method produced accurate results, yet economical designs. The culmination of this work was realized in 2002 with the publication of the AISC/MBMA Design Guide No. 16. This is now the recognized standard for bolted end-plate design and serves the industry well.

Cold-Formed Steel Research

Since the mid-1960's, MBMA has been involved in improving the performance and efficiency of cold-formed steel, primarily metal roofing systems, through advances in AISI's Specification for the Design of Cold Formed Steel Structural Members. Early research was

conducted at Cornell University, under the direction of Dr. George Winter and was sponsored by AISI, with MBMA serving in an advisory role.

The Cornell tests were performed on simple span C and Z-beams, with and without diaphragm bracing, for both uplift and gravity loads. Good correlation was achieved between the test results and their computer model predictions, except for the case of diaphragm braced beams for gravity loads. In this case, the actual tested capacity was considerably higher than the predicted values. Unfortunately, specific design recommendations were not finalized before the work by AISI came to an end. This is where MBMA stepped forward and sponsored additional work by Dr. Teoman Pekoz at Cornell to complete this important component of the research.

In 1980, MBMA recognized that it was increasingly necessary to look at the roof as a system with regard to purlin design for gravity and uplift loads, expansion and contraction behavior, and the impact of insulation. In fact, for purlin design, 22 separate roof system parameters were listed by the Technical Committee that could affect the behavior. Since it was expected that the work of Dr. Pekoz would lead to a design procedure for uplift, the new focus was to do more research for gravity loading.

MBMA selected Dr. Murray to begin the research on the behavior of roof systems under gravity loads in 1981. The objective of the research was to determine the quantitative effects on roof systems of such devices as sag members (intermediate braces), anti-roll clips, roof diaphragm, end anchorage of panels, and the effect of various insulation schemes on the ultimate load capacity under gravity loads.

As Dr. Murray's research continued on gravity loaded purlins, the appropriate AISI provisions for uplift continued to evade consensus. It was hoped that a solution could be reached for inclusion in the 1986 AISI Specification, but discrepancies between the theoretical capacities and the test results of continuous purlins forced AISI to table any revision until a reasonable solution could be reached. It was felt that the discrepancies existed because the Cornell method, verified with simple span tests, could not be extrapolated to a continuous purlin system. MBMA accepted the task of undertaking further research to try to settle the matter.

Dr. Murray's work finally yielded a solution, whereby a simple span test could be used to predict purlin capacity in a continuous span system. This test came to be known as the Base Test and was adopted into the 1996 AISI Specification. This has been hailed as a breakthrough which finally solved the purlin capacity impasse. Maury Golovin, now retired from Ceco Building Systems, and the MBMA Technical Committee chairman in 1994 and 1995, was instrumental in translating this research from the laboratory into the AISI Specification.

Snow Load Research

MBMA pioneered the understanding of snow load accumulations on a roof with the publication of the 1974 MBMA Metal Building Systems Manual. This included drifting snow on stepped or multi-level roofs, drifting snow against roof projections, valley accumulations, and sliding snow phenomena. While these design guidelines were not based on MBMA sponsored research, they were the result of extensive reviews of other country building codes as well as observations of snow accumulations on roofs. MBMA's leadership in this area led to other's taking a closer look. Similar provisions were adopted in the 1982 ANSI A58.1 and then in the1987 BOCA National Building Code.

More recent research was sponsored by MBMA that evaluated drifting snow across the ridge of a low-slope gable roof because it was observed that this phenomena was not properly addressed in the building codes. Dr. Michael O'Rourke of Rensselaer Polytechnic Institute was selected as the principal researcher on several projects beginning in 1995. These projects led to code changes in ASCE 7 that now require the evaluation of drifting snow across the ridge of a low-slope building when the roof slope is greater than ½ on 12, where this was previously not required on roofs with a slope less than 15 degrees.

Wind Uplift Tests (Static vs. Dynamic)

The UL 580 test that had been introduced in 1973 was a success in improving the performance of roofing assemblies by evaluating them in a simulated wind event. But this test was not designed to predict the actual uplift resistance. In 1988, ASTM began the development of the E1592 wind uplift resistance test. One advantage of this test was that it used a larger roof specimen, which is now recognized as a better test for standing seam roof systems. However, both of these tests utilized a uniform static air pressure over the roof specimen which does not represent true wind behavior. The real interaction of wind and structure is known produces wind loads that vary dramatically from one instant to the next, and over very short distances, on the roof surface.

MBMA initiated an effort in the late 1980's to try to better predict the actual performance of metal roofing against high wind uplift forces. This research effort was multi-pronged because there were several good ideas on how to approach this difficult problem. Projects at the University of Western Ontario, Clemson University and Mississippi State University (MSU) were initiated, with MBMA and AISI as initial cosponsors. After several years of evaluating the proposed methods, MBMA decided that the MSU effort, under the direction of Dr. Ralph Sinno, showed the most promise.

A full-scale assembly of a metal roof corner was constructed and tested at MSU using the standard ASTM E1592 protocol to obtain the static uplift resistance. Then, a dynamic test using a grid of 34 electromagnets was used to simulate the actual non-uniform wind behavior. The electromagnets were programmed to reproduce independent time-history traces obtained from the detailed UWO wind tunnel analysis. The simulated wind event was based on Hurricane Andrew. Load cells were placed at selected standing seam clip locations for both the static ASTM E1592 test and the dynamic electromagnetic wind simulation. The clip loads in both tests were evaluated to determine the true load that was being imparted to the roof system.

The UWO solution to the problem provided a backup plan and became an excellent corroboration of the MSU study results, even though it used a completely different approach. Tests were performed on identical models; first in the wind tunnel under simulated wind loading conditions and then again, using elaborate models designed to reproduce full-scale test procedures. This provided a direct correlation between the real (wind tunnel) loads and the simulated roof systems; while conversely, the MSU project used real full-scale roof systems with simulated wind loads. Between the two projects, we were able to learn how to predict the true performance of metal roof systems under real world conditions.

Dr. David Surry and Dr. Eric Ho of UWO took the lead in combining the results from the MSU project with the results of the UWO research into a summary journal article which has been completed and submitted to the ASCE Journal of Structural Engineering. It was found that the E1592 uniform pressure test contains conservatism of about 50% for the roof system tested by both approaches; and up to about 80% for the other roof systems tested only at MSU. Conservatism arises if the roof system is required to withstand the code recommended pressure applied uniformly in the E1592 test. This does not take into account the reality of the dynamic spatially-varying properties of the wind-induced pressures. A proposal has been presented to the AISI Specification Committee to support the adoption of a 50% increase in standing seam roof wind uplift strength over the E1592 static test result.

This was a significant research undertaking, both in its complexity as well as in the potential benefit of recognizing the true uplift resistance of standing seam roofs. It also demonstrates the cooperative efforts that are needed to solve complex issues. In addition to MBMA and AISI, the Metal Construction Association joined the effort along with Factory Mutual. Collaborations like this are an indication of the close working rela-

tionship MBMA has with other steel industry groups and the confidence they have in joining with MBMA to tackle difficult technical challenges.

INSURANCE ISSUES AND FIRE RATINGS

MBMA also became involved early on with insurance issues, particularly to work toward more equitable rates for metal buildings. Butler's R. J. Atkinson was the first Insurance Committee chairman. His committee met in 1958 to lay the groundwork for many continuing programs. In the 1960s, the Insurance Committee began working, in conjunction with AISI, on fire protection and fire ratings for metal buildings. In 1963, the first Insurance Facts Booklet was published by MBMA, with the help of C.W. Schirmer of Schirmer Engineering Corporation. This was followed in 1971 with the publication of MBMA's Insurance Bulletins, which still serve as the primary vehicles to distribute information on the fire rating tests that have been sponsored by MBMA as well as other insurance information.

The impetus for MBMA to develop new fire rated assemblies throughout the past three decades was in part due to the expanded use of metal buildings in applications with new fire protection requirements. Beginning in the 1980's, fire ratings were obtained for ceiling assemblies utilizing gypsum board as well as suspended acoustic tiles. The Insurance Committee continues to sponsor fire rating tests and evaluate new construction assemblies to enable metal building systems to meet and sometimes exceed building and fire code requirements.

THE "SPECIAL BREED"

The technical excellence and leadership that has been the hallmark of MBMA for 50 years is mostly attributable to the remarkable individuals who have helped guide the association. We have highlighted some individuals in this article, but there were many more, especially all of the Technical Committee chairmen noted in the sidebar. The Technical Committee has always fostered a tremendous mentoring atmosphere, to take advantage of the knowledge of the senior leadership while passing the torch to younger members.

As noted by Dr. Ellifritt, "Engineering a more or less standardized product, which has many competitors, requires a different mind set than that required of the consulting engineer. I don't think this fact is always appreciated by the general engineering community. MBMA engineers are a special breed!"

MBMA's Research Leader

In a candid interview with Lee Shoemaker, he spoke on some of the highlights of his current tenure as director of research and engineering for MBMA.

What brought you to MBMA?

A: In 1994, I saw MBMA's ad for a director of research and engineering. I had MBMA's wind loading primer on my bookshelf and was well aware of their leadership in wind engineering. It's been a good fit with my experience in design and research and there are always new challenges that keep me excited. To date, I've managed and coordinated over 50 research projects.

What MBMA project has brought you the most pride?

A: One of my proudest accomplishments is the Seismic Design Guide for Metal Building Systems that MBMA published in 2004. There have been attempts from many others to develop a seismic design guide, but our plan to bring together the leading seismic experts to address specific issues with metal buildings produced an exceptional document – many engineers outside the industry have commented to me that it is one of the best seismic guides available.

What is most satisfying about your work at MBMA?

A. My biggest satisfaction is helping to change the industry image. I represent MBMA on technical committees of the AISC, AISI, ASTM and ASCE. Without such representation, metal building systems could be overlooked or inaccurately portrayed in code and specification documents. Also, some engineers didn't appreciate the engineering expertise of our members. But since we've become more proactive in national and international code and committee work, there has been a definite change in attitude. Before, people would not seek out MBMA's opinion or try to work with our organization. Now, that's changed considerably. When we go to meetings, we're on an even status with others around the table. Engineers from all over the world respect our accomplishments.

MBMA's Technical Committee Chairmen

Robert Blickensderfer	Armco	1957 – 1962
Norman Rimmer	Butler Manufacturing	1962 – 1971
Lyle Wilson	American Buildings	1972 – 1974
Gilliam S. Harris	Mitchell Engineering	1975 – 1977
William Sontag	Pascoe Steel	1978 – 1980
John Rave	Inryco	1981 – 1983
Donald Johnson	Butler Manufacturing	1984 – 1986
Joe Nunnery	AMCA Buildings	1987 – 1989
J. Walter Lewis	Kirby Buildings	1990 – 1991
Donald Johnson	Butler Manufacturing	1992 – 1993
Maury Golovin	Ceco Buildings	1994 – 1995
Joe Nunnery	Varco Pruden	1996
J. Walter Lewis	Kirby Buildings	1997 – 1998
Barney Ruble	Steelox Systems	1999
Mark Radmaker	Garco Buildings	2001 – 2002
Eric Masterson	NCI Buildings	2003 – 2004
Scott Russell	Nucor Buildings	2005 – 2006

The Energy Edge

Today we must be mindful of the total building envelope from a structural, as well as an energy savings point of view. MBMA is dedicated to the Green Building Movement's practices of reducing each building's impact on human health and environment through better design, construction, operation, and maintenance throughout the life of the building. That's why the MBMA board created a standing Energy Committee that is focused on fair and equitable treatment of metal building systems by energy codes, standard organizations, testing and rating groups, and other governmental and non-governmental groups.

Even before developing the energy committee, MBMA was one of five associations who created the Cool Metal Roofing Coalition, and is currently chairing the organization. Most recently, MBMA conducted training seminars pertaining to energy issues throughout California and partnered with the Cool Metal Roofing Coalition to train the California Association of Building Energy Consultants (CABEC) members, architects, and engineers in California on June 28 and 29.

METAL BUILDING SYSTEMS MANUAL

MBMA's Metal Building Systems Manual is the industry-standard design manual for architects, manufacturers, engineers, specifiers, builders and other professionals involved in the metal building systems industry. MBMA plans to release a completely updated edition of the manual in September, 2006. The new manual will include the IBC 2006 provisions related to metal buildings, as well as updated wind, snow, seismic and rainfall intensity loads for all counties in the U.S.

The current manual's sections cover: Load applications (IBC 2000 loads); crane loads; serviceability; common industry practices; guide specifications; AISC-MB certification; wind load commentary; fire protection; wind, snow and rain data by U.S. county; glossary. It provides significant commentary on International Building Code (IBC) 2000 loads including recommendations on applying them to metal building systems. The manual also contains a complete CD-ROM version, which is both hyper-linked and searchable.

METAL ROOFING SYSTEMS DESIGN MANUAL

The Metal Building Manufacturers Association is also the publisher of the Metal Roofing Systems Design Manual - a one-of-a-kind design and detail manual for architects, manufacturers, engineers, specifiers, builders and others involved in the metal roofing industry. For over two years, a team of MBMA roofing systems members and association staff worked to develop the manual. It includes: systems components, substrates, specifications and standards, retrofit, common industry practices, design, installation, energy and fire protection.

Perhaps the most labor-intensive aspect of the manual was the selection of the metal roof details. According to Dan Walker, P.E., MBMA staff engineer and project manager for the Metal Roofing Systems Design Manual, the team began with over 700 roofing details provided by MBMA members. After several months and multiple committee meetings, the team developed approximately 90 generic details for easy reference. The challenging part of this process was that all of the details that appear in

the manual needed to be representative of the common practices for the industry. Details at mbma.com (click on Bookstore).

The Metal Roofing Systems Design Manual focuses on standing seam metal roofing systems and serves as both an educational tool and a design aid for professionals working with these materials. The purpose of the details and provisions of the manual is to educate professionals about the proper specification, design and installation of metal roofing systems. "We set out to develop a manual to help upgrade the design practices of the metal roofing industry, and we feel confident that we have accomplished that goal," Walker said.

Details at mbma.com (click on Bookstore).

MBMA Influences Industry Growth

Thanks to the efforts of MBMA and its members, metal building systems sales have risen dramatically during the past 35 plus years, when annual sales were first recorded. In 1960, sales were estimated below $1 million. Industry shipments were $2.54 billion in 2005 and are forecasted to grow even higher in 2006. This figure is indicative of how building owners, engineers, architects and others in the specification community have embraced the durability, utility and life-cycle cost advantages associated with using metal building systems for low-rise, non-residential buildings.

Other factors that demonstrate the popularity of metal buildings include steel shipments, recorded at January 4, 2005, of 400 million tons. The industry had a minimum of 400 million square feet of buildings put in place during 2005. Typically, metal buildings represent 15-20% of a total construction project so the industry impacted over $11 billion in total construction of low-rise construction.

A breakdown of MBMA member's 2005 sales by end-use categories include: 42% commercial buildings; 25.5% manufacturing buildings; 17.7% community facilities and 15.1% miscellaneous projects.

MBMA's High-Impact On Low-Rise Construction

MBMA has made numerous contributions to the industry in its first 50 years.

In the beginning, the industry faced many building code challenges, both local and national, and was plagued by many restrictions and insurance requirements. Early on, the industry was hampered by a number of forces including union conflicts and jurisdictional disputes. All these areas needed to be convinced of metal's viability as a product and MBMA helped to pave the way.

The association has also helped to cultivate the relationships between the manufacturer and the builder/dealer, a relationship that has worked well for both parties. The manufacturer has a dependable outlet for his product and is willing to provide training, marketing support and direction. The builder knows he has single-source responsibility with people he knows. This marketing concept has proven successful as the industry has been able to respond to market demands and changes.

In the early days, the product did not look as sophisticated as it does today. Therefore, it was not readily accepted by architects and engineers. Conquering this image was perhaps the greatest challenge faced by the industry. The image began to fade when manufacturers sharpened their skills to shape steel and other materials into attractive, functional and economical structures. Much of the change in the industry is due to the new aesthetics in systems architecture—sweeping expanses of glass, dramatic overhangs, cantilevered designs and attractive fascia. Softer, more neutral colors in paint selections make it easier for architects to combine metal panels with brick, stone, concrete and wood. MBMA has been in the forefront of campaigns to promote the economy, durability, and aesthetics of metal building systems through education, advertising, speaking engagements, brochures, direct mail and other promotional investments.

Perhaps the largest contribution of MBMA has been the ability to provide a united group, promoting the industry's philosophy of systems' integrity to meet the needs of the marketplace.

MBMA Technical Timeline:
Industry-Changing Events Through Five Decades

1956

December – MBMA was organized into an industry association and held its first annual meeting in Chicago, IL.

1957

April – Inaugural MBMA Technical Committee meeting in Chicago, IL.

Insurance Committee met in Chicago….. The Insurance Committee had been formed by MBMA to address the effects of insurance rates on construction. Butler's R. J. Atkinson was the first chairman and his committee laid the groundwork for many continuing programs.

1959

MBMA published "Recommended Design Practices Manual". It had 27 pages and sells for one dollar.

MBMA published "Code of Standard Practice".

1960

MBMA member sales had grown from $69.6 million in 1956 to $98.9 million in 1960.
Steel shipments were in the range of 260,000 tons. Market share was 20% of low-rise, non-residential construction. MBMA had 16 members with 23 plants, and a total of 1,000 dealers. The typical end product at this time was under 10,000 sq. ft. and in 1960, agricultural users accounted for 34% of total MBMA shipments. The remaining 66% went into commercial, industrial and other uses.

Insurance Committee first discussed the concept of fire-protection for metal buildings.

1961

MBMA became active in advising AISI on a research project they were carrying out at Cornell University, under the direction of Dr. Winters, on Diaphragm Action in Roof and Wall Panels.
In 1962, MBMA was involved in the first UL-approved roof, which lowered insurance costs for years to come.

1962

Norm Rimmer of Butler begins 10-year tenure as Technical Committee chairman.

1963

MBMA published "Recommended Guide Specification" and "A Primer of Wind Loads on Gable Roof and Flat Roof Buildings".

First "Insurance Facts" booklet was published by Committee on Insurance Matters (written by C. W. Schirmer of Schirmer Engineering Corporation).

1964

MBMA began the development of a roofing weather tightness test that included both a wind-driven rain evaluation and an ice damming test with the roof subjected to standing water.

1966

MBMA first cosponsored a major research effort. Dr. George Lee of the State University of New York at Buffalo investigated the behavior of tapered members in a project jointly funded by the U.S. Navy, AISC, AISI and MBMA.

MBMA compiled information on the thermal properties of insulation, recognizing that energy conservation was becoming more important

1967

AISI published "Design of Light Gage Steel Diaphragms" with the cooperative efforts of MBMA and SDI.

MBMA's Technical Committee was involved in helping Underwriters Laboratory develop an uplift test that became the precursor to UL 580.

1968

MBMA established the Purlin Uplift Subcommittee and began assessing research needs and available test data.

1969

The MBMA board directed the Technical Committee to prepare a list of research projects that might be undertaken by the association

"which could lead to major breakthroughs for the industry." The prioritized list of projects were: (1) Fire Protected Walls and Columns, (2) End Plate Moment Connections, (3) Diaphragm Action, (4) Lateral Support of Tapered Members, and (5) Major Axis Buckling

1970

By 1970, MBMA had grown to 25 members with 40 plants, and the number of builders/dealers had tripled to 3,000. Percentages for end use of products were: commercial and industrial, 36% each; agricultural, 10%; community, 8%; and miscellaneous, 10%.

MBMA statistics showed that manufacturer sales in 1970 were $363 million. Steel shipments grew to 659,000 tons and market penetration in the low-rise, non-residential segment of construction increased from 20% to 30%.

AISI first evaluated the use of limit states design that was gaining momentum in Europe and MBMA provided assistance.

1971

MBMA published "Metal Building Systems Manual" – with Recommended Design Practices, Recommended Guide Specifications and Metal Building Systems Nomenclature.

Professor Sanger of Texas Tech conducted a study for MBMA on "Response of Metal Buildings to Tornadic Winds" based on observations after the Lubbock, TX, tornado. This was the beginning of many field investigations that would provide insight into metal building performance.

MBMA provided funding and research for the First Specialty Conference on Cold-Formed Steel Structures hosted by the University of Missouri-Rolla.

MBMA commissioned Dr. Krishnamurthy of Auburn University to conduct the research on bolted end-plate moment connections. He proposed using finite element analysis which was relatively new and only commonly used in advanced aerospace applications. AISC agreed to co-fund the project.

MBMA published first Insurance Bulletins.

1972

Technical Committee began inviting leading researchers to make presentations at meeting, such as Dr. George Winter and Dr. George Lee.

ANSI A58.1-1972 was published but did not have appropriate wind loads for low-rise buildings. This gave incentive for MBMA to get involved in research and building code adoption of wind loads.

MBMA provided additional funding so that Dr. Pekoz of Cornell could complete the work on bracing requirements for C and Z members attached to sheeting.

1973

A vertical rib and trapezoidal standing seam roof system was introduced in the early '70s, increasing architects' interest toward metal. Standing seam roof systems also began to come into prominence. They offered greater energy efficiency and water tightness by elevating the roof seam above the water plane and eliminating fasteners through the panel.

New design and manufacturing techniques made possible structures of increased strength-to-weight ratios, using members with lighter cross sections and higher strength steel. Energy savings were added with the factory-insulated sandwich wall panel, giving low U-values and further attracting building designers and owners.

1974

In 1974, MBMA formed a Mill Relations Committee with William Slaton Sr. of Delta Steel Buildings Company as chairman.

MBMA began discussions with leading researchers on carrying out wind tunnel research –Dr. Alan Davenport of University of Western Ontario (UWO) was selected to begin the work.

MBMA hosted first Researcher's Meeting to have all researchers present their findings and to have interchange with the Technical Committee.

MBMA began deliberations on AISC's new Certification Program and how that might benefit the industry.

Supplement No. 3 was released for the AISC Specification that adds Appendix D on Tapered Members that was based on Dr. George Lee's work, cosponsored by MBMA. The use of Appendix D is optional to the designer but can result in significant savings in material when tapered members are used.

MBMA successfully performed column fire tests. Also in this year, the name of the committee was changed from "Committee on Insurance Matters" to "Committee on Fire Protection and Related Insurance Matters".

1975

MBMA hired a full-time director of research and engineering, Dr. Duane Ellifritt from Okalahoma State University.

MBMA awarded UWO a $15,000 contract to begin wind tunnel studies.

MBMA/TIMA Subcommittee met to review energy issues in California. A pending California senate bill was being followed closely that would impact the amount of insulation required in a metal building (early Title 24 development).

1976

First meeting of MBMA's Certification Committee to evaluate the need for developing criteria to be used in the AISC program, covering metal building systems and to develop recommended criteria for board review.

1977

New project on roof expansion/contraction was funded that included field measurements at one of MBMA members' manufacturing facilities (Garco).

First MBMA Design Workshop was held in conjunction with the Technical Committee meeting.

MBMA sponsored a Wind Research Symposium at UWO and invited building officials and consultants to learn more about the ongoing research and plans for codification.

The 1/3 allowable stress increase was coming under growing scrutiny, prompting MBMA's Duane Ellifritt to author "The Mysterious 1/3 Stress Increase", published in AISC's Engineering Journal. It provided one of the most thorough documentations to its origin and justification.

1978

MBMA research on the amount of residual stress in welded columns was begun by Dr. Avent at Mississippi State University. There were suspicions that higher residual stresses could reduce the column capacity over similar rolled sections, but this project eliminated that concern as far as typical metal building columns are concerned.

MBMA completed work at Midwest Research Institute that showed that the mass effects of masonry walls was not as influential in reducing energy costs when all the factors were considered, including setback thermostats.

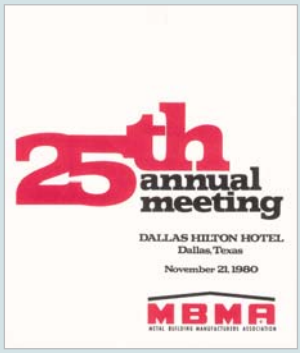
1979

Heavy snows in recent winters in the Chicago area caused failures to all types of construction, including metal buildings. MBMA initiated a Roof System Behavior project to address gravity loads and purlin roll forces by looking at the entire system effect, including roof insulation.

1980

MBMA sales in 1980 were over $1 billion dollars, compared to $323,000,000 a decade earlier. Member steel shipments were in excess of 1 million tons. In 1981, MBMA had 35 members operating 74 plants in the United States and 10 overseas. There were 8,800 independent dealer/builders.

MBMA published "Metal Building Systems" in conjunction with the Metal Building Dealers Association.



The MBMA Technical Committee formed the Code Action Subcommittee to be better organized and influential with the growing number of state and local codes that were offshoots of the three model building codes.

First MBMA graduate fellowship is awarded to a student at the University of Wisconsin – Milwaukee for anchor bolt research.

1981

MBMA selected Dr. Tom Murray at the University of Okalahoma to begin researching the behavior of roof systems under gravity loading. The two-year study began with an analytical procedure, followed by four full-scale purlin tests – two with simple spans and two with intermediate braces.

MBMA organized a Metal Building Symposium coordinated by the University of Wisconsin – Madison. Featured speakers were Dr. George Lee, Dr. Teoman Pekoz, and Dr. Jim Fisher.
MBMA published Dr. George Lee's seminal work on the tapered member research entitled, "Design of Single Story Rigid Frames."

1982

MBMA published "Crane Manual for Metal Building Systems".

The Southern Building Code adopted MBMA/UWO wind loads as an alternate procedure.

1984

Dr. Dale Perry of the University of Idaho, who had been the principal researcher on the roof thermal expansion project, replaced Dr. Ellifritt as MBMA's director of research and engineering. Dr. Ellifritt left to accept a faculty position at the University of Florida.

1986

MBMA aggressively pursued an MB category of AISC Certification, setting up a committee to put together a working program.

MBMA began research on snug tight bolts, cosponsored by RCSC and AISC.

1987

MBMA members (Butler and American) contributed building and turntable for a Texas Tech project to measure actual wind loads on a building that can be rotated based on wind direction.

UL Grants MBMA UL Design No. P516, based on engineering evaluation of a combination of AISI roof/ceiling tests and a small scale MBMA test.

1988

Gill Harris became MBMA's director of research and engineering, bringing many years of industry knowledge to the position, especially with his long involvement with wind engineering and standards.

1989

MBMA sponsored Wind Engineering Seminar at the University of Western Ontario for building officials and standard writers.

MBMA sponsored a study by Dr. James Fisher on serviceability of low-rise buildings that would become the basis for AISC Design Guide No. 3.

1990

MBMA published updated "Metal Building Systems" in conjunction with the Building Systems Institute.

MBMA participated in the first RICOWI meeting organized by Oak Ridge National Laboratory.

1991

MBMA began ambitious research projects to develop a dynamic wind uplift test evaluation for roofing. Projects at UWO, Clemson, and Mississippi State were funded to address different aspects of the problem.

ASTM A529, Grade 50 steel is adopted as standard, based largely on the work of Don Johnson and MBMA.

1992

Full scale metal building at Texas Tech is instrumented and wind load data was collected to compare to wind tunnel models. MBMA was a cosponsor of this project.

MBMA research was completed that will reduce the lap requirement for cold-formed C's in the AISI Specification.

Hurricane Andrew struck southern Florida and impacted construction and building codes. This led to a series of MBMA test modeling programs.

1993

Dr. Ellifritt of the University of Florida completed a study comparing primary frames designed to LRFD and ASD Specifications, concluding that there is not much difference in the total frame weight.

1994

Dr. W. Lee Shoemaker was hired as MBMA's director of research and engineering

Northridge Earthquake struck Southern California and lead to significant seismic design changes in the building codes.
1995
MBMA and Armstrong World Industries successfully completed a full-scale roof/ceiling test using suspended acoustical ceiling tiles.

MBMA was successful in getting BOCA to accept deflection limitations for members supporting metal cladding that is consistent with other model codes.

1996

The Base Test was incorporated into the 1996 AISI Specification, culminating many years of MBMA-sponsored research to determine the amount of lateral support that a standing seam roof provides to supporting purlins.

MBMA helped fund a research project by Dr. Roger Laboube at UMR which resulted in a 30% increase in Z purlin web crippling capacity and was incorporated into the 1996 AISI Specification.

MBMA published the 1996 Low Rise Building Systems Manual, in binder format for the first time.

1997

MBMA published the first compilation of ASTM standards for metal building systems.

AISI published the Standing Seam Roof Design Guide, the development of which was co-sponsored by MBMA.

MBMA reinstated the Graduate Fellowship Program and awarded a fellowship to a student at the University of Connecticut.

The Research Council on Structural Connections approved the use of snug tight bolts in low rise

building applications where there is not an overhead crane. This was based on research sponsored by MBMA.

1998

MBMA sponsored a seminar on the design of purlins supporting standing seam roofs presented by Dr. James Fisher and Dr. Roger LaBoube.

AISI published the Panel Design Guide that was co-sponsored by MBMA.

Dr. Murray of Virginia Tech began seismic testing of end-plate connections for MBMA in response to new Northridge earthquake requirements.

1999

MBMA joined with AISI, NCCA, MCA, and NamZac to sponsor cool roof research at ORNL.

2000

First International Building Code was published, which integrated the three model codes into a single code and MBMA began a comprehensive study of the code to determine its impact upon metal building systems.
MBMA began to assist NIST to develop a computer database of wind tunnel data that could become the next generation of wind engineering.

The first Annual Report of MBMA Technical Research Activities was published that summarized all ongoing projects with their objectives and status.

2001

MBMA published the first Metal Roofing Systems Design Manual with industry-approved metal roofing details.

The AISC/MBMA Design Guide No. 16 on bolted end-plate connections was a milestone publication that was the culmination of many years of MBMA-sponsored research on these types of connections.

MBMA research was completed by Dr. Murray of Virginia Tech that substantiated that washers are not required for slotted holes in purlin laps. This was adopted into the 2004 AISI Supplement.

2002

MBMA published 2002 Edition of the Metal Building Systems Manual (changing name from Low Rise Building Systems Manual) and incorporated load requirements from IBC 2000.

Dr. Shoemaker made a presentation at a UWO Symposium honoring the 40 years of wind engineering contributions of Dr. Alan Davenport, focusing on the MBMA collaboration with UWO over the years.

MBMA joined the Cool Metal Roofing Coalition, composed of AISI, MCA, NCCA, and NamZAC.

MBMA looked to the future and commissioned former Clark County Building Official and chair of ICC's Performance Based Design Committee to prepare a white paper on the performance-based design of metal building systems.

2003

MBMA Graduate Fellowship project at Rensselaer Polytechnic Institute determined that snow does not drift over the ridge of a gable roof with a slope less than ½ on 12.

MBMA research project at UWO was completed to better understand how parapets affect wind loads on buildings. This lead to changes in ASCE 7-05.

2004

MBMA published its first Seismic Design Guide for Metal Buildings, authored by four seismic experts.

MBMA established an Energy Committee to focus in energy codes, cool roofs, and strategies to better insulate metal buildings.

MBMA participated in the RICOWI Wind Investigation Program, after hurricanes Charley and Ivan.

2005

OSHA and the Steel Coalition, of which MBMA was a coalition partner, agreed on a voluntary plan for the use of roll forming lubrication in lieu of a regulation on slip testing. In addition, MBMA inserted the requirements into the AISC-MB Certification program.

AISC published the first LRFD/ASD combined specification and MBMA began a comprehensive study of the specification to determine its impact upon metal building systems. In addition, MBMA began developing the specification requirements for inclusion into the AISC-MB Certification program.

MBMA initiated a new seismic research project at UC San Diego to learn more about the seismic behavior of metal buildings and to recommend appropriate seismic design standards.

By Bob Ammerman, Chairman,
Metal Building Manufacturers Association

Chairman's Column

MBMA - There's Just Nothing Like It

My first exposure to the MBMA was in the mid 70's as a general manager for the Varco-Pruden Building organization. Bob Kelley was the president of VP at the time and an avid supporter of the MBMA. Bob served as MBMA chairman on several occasions dedicating his leadership and the support of his company to the advancement of the association and our industry. As a result of his inspiration my MBMA commitment emerged.

I probably attended my first meeting about 1980 and was in awe of the industry leaders and their vision for growth. While fierce competitors by day, they shared a friendship and common commitment to the best interest of the industry. Observing these industry giants shaped the principles for my 30-year building systems career. As I moved from VP Buildings to Stran Buildings to the UDI Buildings Group to American Buildings and MAGNATRAX, I jointly carried the flag of the MBMA and the companies I served.

I have enjoyed multiple terms on the MBMA executive committee and been privileged to serve as chairman on two occasions (1995 and 2006). I believe the MBMA is the most productive association with which I've been involved. If it weren't for our research and engineering accomplishments, our work with building code officials and local code authorities, the building systems industry might not have ever emerged.

INDUSTRY-CHANGING EVENTS

Two of the most significant programs developed in the MBMA's 50-year history are the AISC-MB Certification and Associate Member programs. The certification program has moved the industry to an unprecedented level of quality and credibility, assuring building owners superb value. The Associate Member program has embraced suppliers of products and services to our industry. It has enhanced mutual understanding and resulted in a common commitment to industry growth and success. Today's Associate Members are involved side-by-side with manufacturing members in every aspect of MBMA activities.

Industry consolidation and leadership changes have introduced challenges to the MBMA during the last decade. The industry has emerged from primarily entrepreneurial, locally-owned businesses to include corporate conglomerates and international owners. While the brands remain relatively constant, the number of corporate entities has lessened with multiple branding becoming common place. The MBMA challenge is to retain the support and resource commitment of all companies, both large and small. Communication effectiveness is more important than ever before. Together we can accomplish far more than as individual companies.

I enjoy my career in the buildings industry. Our industry has helped millions of building owners realize their dreams. Personally, I am richer because of friendships built with MBMA colleagues, thousands of builders and the associates of the companies for whom I've been privileged to serve. I think you will see this as a common theme in the following interviews with some of MBMA's past chairmen. As you read their comments, please recognize the sacrificial contributions that each has made for the betterment of our industry.

LON SHEALY served as MBMA chairman in 1979 and served on the executive committee from 1975-1979. He began his career in the metal building industry in 1947. After retiring from the workforce in 1987, he wrote a book, Destiny by Design, on strategic planning. He was also appointed Assistant Director of Commerce by the governor of Oklahoma. Today, at age 82, he runs a program to build integrity and character in teens. (Learn more at theadventureoflife.com.) Here's what he says about his time in the industry:

On MBMA's Influence

When I was on MBMA's executive committee, we had a mission to do better by the construction industry, offering attractive and functional structures at lower costs. The net value is that our efforts saved the American economy billions and billions of dollars. Much of the retail and commercial construction could not have happened without systems construction.

As an association, those of us who led competing companies learned to work together. Just as when Butler shared their research on wind damage in Canada, we learned to trust and help one another. We became loyal to our industry. MBMA made this possible. They saw the potential of teaming together and lived up to it.

In my opinion, no association has done it better.

On Innovation

During this time, the industry also came to grips with the power and value of innovations. By systematizing and industrializing the construction process we married the concepts of automation, industrialized production, and installation. And by joining them together … acting out-of-the-box … we became part of building an industry.

In the process of building an industry, we built bonds between manufacturers and contractors. We realized we needed each other to spur innovation. Together, we learned not to fight other products that could be used with metal, but to accommodate masonry and other surfaces to provide a more versatile product.

When computers were new, we brought a child to our annual meeting and set him before a computer to let him show the builders how easy it was going to be to estimate building costs with technology. We were among the first to bring computers into the builders offices.

As early as the 1960s, we could see the beginnings of globalization and introduced our first metal building in Israel. People were astounded, calling it "the miracle building" because it went up so fast.

DON PRATT served as chairman of MBMA in 1983 and was on the association's executive committee for several years prior to his chairmanship. An industry leader throughout his career, he remains visionary about the industry and respectful of MBMA's contributions. Here are his thoughts:

On MBMA's Impact …

Thomas Associates and MBMA showed vision early on when they chose to bring design capability on staff. They were one of the first trade associations to think in terms of research and analysis and its potential impact on their industry. Research, for example, led to proper light gage steel design. We had the AISC manual for main frame design, but it didn't have informa-

tion for designing purlins and girts and other components that make up a building.

Also, MBMA doesn't take enough credit for their safety programs. The industry became a lot safer because of MBMA.

The continued refinement of statistical information is another MBMA attribute. Their statistics identify market opportunities and allow companies to address markets with better knowledge and insight based on solid data.

And, of course, the AISC-MB Certification program is one of their association's primary achievements. Certification has enabled the industry to greatly enhance its stature in an increasingly technical industry.

On the Future ...

The building systems industry grew into an industrial building market that led to new systems solutions. But today, this market is declining as manufacturing moves offshore and into foreign labor markets. The future lies in commercial and institutional markets. While requiring different structures and solutions, these markets offer enormous growth opportunities.

On MBMA's Place in History ...

Our industry has a unique history and MBMA is a unique organization. It has created a place where competitors can work in cooperation to solve industry issues. Such cooperation has allowed the technology to evolve and adapt to offer high performance solutions for commercial and industrial buildings.

MBMA encourages the exchange of ideas. This has led to a steady stream of new construction and system building technologies that have changed individual member companies and the industry as a whole.

GEORGE KING served on MBMA's executive committee from 1987 to 1990, and again from around 1992-1995. He also served as chairman twice – in 1990 and 1995. George felt his "call to duty" was rewarding because of the significant achievements of that era. Here are his thoughts:

On Certification ...

"I was on the executive committee when the board of directors adopted the AISI-MB Certification program. It is one of key accomplishments that MBMA has achieved in its 50 years. Certification raised the level of quality which allowed metal building systems to become more widely accepted by code authorities.

"I was one of the drivers of the program, along with several other board members. It brings up vivid memories of long hours and hard work, but the result was industry-changing."

On Industry Research ...

"Throughout its history, MBMA's solid commitment to research has had a major influence on the industry. This research has enabled the industry to broaden its horizons in terms of end use of metal systems. Metal became more than 'tin sheds' and 'shades and shelters.' Metal systems became widely used and attractive – because of the research effort. And, the research enabled the technical committee to work with model and city code authorities to gain wider acceptance of metal building systems in the marketplace.

"Research, development, and engineering … along with certification … changed our industry and led to tremendous growth. And it was all accomplished by a group of highly competitive companies who chose to unite and come together for a common cause. I've seen this happen to some extent in other associations, but none others have been as successful at this as the MBMA."

TERRELL LANDRUM served on MBMA's executive committee from 1994 to 1998 and was elected chairman in 1998. Today, "I'm living a full life and having a wonderful time," he said, "I highly recommend retirement if you can afford it!" His days revolve around fishing, tennis, travel and grandchildren. Here are his thoughts on MBMA and the metal building industry.

On Standards...

During my years on the executive committee, MBMA continued to enhance the AISI-MB Certification program. It is an outstanding program, in terms of creating value and quality for the entire industry. It sets stringent standards for the design and manufacturing of buildings for the betterment of the whole metal building industry.

On the Future...

I believe metal systems manufacturers will continue consolidation with only five or six very large firms in the next ten years, and several smaller regional firms surviving in their geography. It's good when small firms join to make one better firm, creating economics of scale. But when large firms merge for the sake of getting larger, employees will lose jobs, the company will lose talent, and indifference can grow. It's not a good thing if it won't benefit the people.

On MBMA's Value...

MBMA has brought value to our industry. Forty years ago, we were building "shade and shelter" structures. Establishing the MBMA brought us all together to become more sophisticated, to have higher ethics, and to promote our industry. Because of MBMA, we became a more respectable industry and we can stand together and be heard with one voice. This is very important as we work with the code bodies, major steel companies, and specifiers.

BOB LOWE was chairman of MBMA in 1999 and 2005. Throughout his career, he has spent 16 years on MBMA's board of directors and worked on many committees and special initiatives. "I have witnessed the evolution of the MBMA," he said, "from an exclusive 'Good ol' Boys' club to a flexible organization that responds proactively to inevitable change." Here are his comments:

On the Codes

The development of the 2000 International Building Code which incorporated the most conservative features of most of the previous regional building codes, put us at competitive disadvantage. More than anything else, the 2000 IBC, demonstrated how clearly MBMA needed to be focused on technical research and code lobbying, which has become a great strength of the association.

On MBMA's Place in the Industry

Since our technology and products are unique to our industry, the early days of the MBMA were earmarked by the united efforts to gain acceptance for our form of construction in the market place. After that initial success, the role of the association became to broaden our scope of acceptance and defend our gains. The MBMA is the only association that compiles the technical and marketing information necessary to grow the industry as a whole.

On the Future

All things cycle. I see the demand for MBMA products growing with the population and consumption per capita that drives non-residential construction. My ten year forecast is that the up and down cycles will be 25% higher than the last decade with a peak year at 2.5M tons. As markets improve, the past consolidations will reverse somewhat as newer, smaller regional companies again appear in prosperous niches.

On the Industry

Our industry focuses on meeting a real need of society. Our buildings safely and economically house all of the activities that make peoples' lives better. Places of work, distribution, worship and recreation all come from our plants. There is little doubt that our industry has improved the quality of life in this country…..and will continue to do so!

CHUCK STOCKINGER is the industry's most knowledgeable resource on MBMA history. He began working for Thomas Associates, Inc. (and on the MBMA account) in 1974. He has been general manager of the association since 1980. In his 32 years with MBMA, he has seen many things and has been involved in every corner of the industry. Here are some of his thoughts:

On MBMA's Achievements …

MBMA has had a tremendous impact on the expansion of the industry and made giant strides through model code work, structural research, fire testing, market development, AISC-MB certification, in-plant and on-site safety, and industry statistics – to name a few . Such a broad-based association has advanced the industry and led to the advancement of other related associations. We've dramatically improved the image of steel building systems and helped to improve their quality and reliability. We've helped to give the industry form and substance. Yet, all of these advancements would have been impossible without the tremendous and constant commitment, and financial support made available over the years by the senior management of the association's member companies. They have been—and are—the change agents that have made it possible for the industry to become the credible leader it is today.

On Leadership …

The original members had to pioneer virtually every single initiative and program. There was no model in terms of an industry association to learn from. One of the most important original projects was the development of the metal building systems design manual. This allowed us to identify common practices and clarify design parameters unique to metal building systems. It helped lead to the recognition and acceptance of metal building systems by specifiers and end users, and positively influenced the various building codes. This, of course, helped the industry to grow. The manual has been continuously improved and updated over the years, and has become accepted as the authoritative resource on metal building systems design by building code officials, specifiers, and end-users nationwide.

Another significant leadership action occurred in the late 1950s. Through the hard work of the members, we were able to have a positive effect on the insurance industry and helped them to recognize that metal building systems are a good risk, and typically perform quite well under extreme conditions. This effort was another milestone in the industry's ability to gain credibility and acceptance, and to grow.

AISC- MB Certification, which AISC and MBMA pioneered and implemented together, is also a leadership initiative that changed the industry. The program certifies manufacturers of metal building systems and identifies important performance characteristics typical in the design and fabrication of metal building systems. Finally, our early and continuously extensive work in collecting and compiling industry statistics has brought benchmarking and demographics to the industry. Few associations can boast such comprehensive statistical programs.

MBMA's Associate Program Builds Crucial Intra-Industry Relations

MBMA's Associates Member program was instituted in 1995 and has resulted in a far more robust organization. Originally, the association only served metal building system manufacturing firms. The addition of the Associates program allowed participation by companies who supply critical products and services for building systems manufacturers.

"The addition of the Associates program changed MBMA from an association for manufacturers to an association involving all industry stakeholders," said Randy Ridenour, vice president of Atlas Bolt & Screw Co.

Ridenour cites three ways in which participation in MBMA has benefited his firm:

• It has allowed them to understand the industry and have a better handle on where it is headed, through the statistics MBMA provides.

• It has introduced his company to industry leaders whose manufacturing firms are current or potential customers.

• Involvement in committee work has led to new contacts, opportunities to uncover product development potential and to address specific industry needs.

Ray Bauer, vice president for sales and marketing and CMC Steel concurs. By getting involved in MBMA through the Associates program, his firm gained knowledge of the industry and that helped them decide to produce high-strength flat bars that metal building system manufacturers need to make support beams. "We made a commitment to make a product they could use," says Bauer, "and this allowed us to double and quadruple our sales to the industry over the past ten years."

Bauer says that participation in the association helps his team understand "what makes MBMA tick" and makes them want to invest more in the industry. "Knowledge of the industry, obtained through involvement in MBMA, has led to good, solid, synergistic relationships with building manufacturers," he added.

Al Dunlop is general manager of Valspar Corporation, the sixth largest coil and extrusion coatings company in the world. He underscores the value that the Associates program has brought to his firm. "MBMA is proactive and involved in code work and specifications that make the metal building systems industry more credible," he says. "We feel like we are partners with the manufacturers and that we're all working together for the benefit of us all."

All three men give special credit to Bob Ammerman, who served as chairman when the Associates program was instituted. "Bob has great passion for the industry beyond anyone I know," said Ridenour. "He has a great ability to set aside the interests of his own firm and get people motivated for the good of the industry."

ASSOCIATE MEMBERS

Metal Building Manufacturers Association

Akzo Nobel Coatings Inc.
ATAS International Inc.
Atlas Bolt & Screw Co.
BASF Corportation
Building Research Systems Inc.
CertainTeed Corporation
CMC Steel
CMC Steel Group
Consolidated Metal Products
Custom Solution Roof & Metal Products
DOFASCO
Dominion Building Products
Dow Chemical
Expi-Door Systems Inc.
Feralloy Corporation
Gerdau Ameristeel Corporation
Guardian Building Products Inc.
ITW Buildex
Metal Building Software Inc.
Metallic Products Corporation
New Process Steel L.P.
Nucor
Owens Corning
Palram Americas Inc.
Questware Corporation
Roof Curb Systems LLC
Schnee-Morehead Inc.
SFS Intec Inc.
Sika Corporation
Socar Inc.
Southeastern Bolt & Screw Inc.
Steel Dynamics Inc.
Steels Cape Inc.
Tremco Inc.
United States Steel Corporation
Valspar Corporation

The Road To MBMA's Technical Excellence

By W. Lee Shoemaker, P.E., Ph.D.
Director of Research and Engineering
Metal Building Manufacturers Association

The Metal Building Manufacturers Association holds a strategic planning session every two or three years, and the situational analysis invariably lists MBMA's technical leadership and reputation as key strengths of the association. Therefore, it would be appropriate, as we celebrate MBMA's 50th anniversary, to reflect on the journey taken to achieve this important distinction.

EARLY ORGANIZATIONAL MILESTONES

When founded, "MBMA's main purpose was to jointly attack technical matters that could not be accomplished by individual companies," according to the late James Murphy, former president of American Buildings Co. and former MBMA chairman. Therefore, it was no surprise that, at MBMA's first annual meeting on December 4, 1956, the formation of a Technical Committee was one of the top priorities.

The MBMA Technical Committee first met on April 18, 1957 in Chicago, IL with nine member companies in attendance: Armco, Butler, Carew, Cowin, Inland, Metallic, Steelcraft, Stran, and Wonder Building. Robert Blickensderfer of Armco, affectionately known as "Blick", served as chairman of the Technical Committee until 1962. Also in attendance were Butler representatives Wilbur Larkin, the first chairman of MBMA, and Norm Rimmer who was chairman of the Technical Committee for a remarkable 10 year period, following Blick.

The first order of business for the new organization was to determine the common technical issues facing the industry and to collectively develop an action plan. It is an obvious challenge for competitors in the marketplace to come together in this fashion, but the founding members of MBMA really set the cooperative tone that would shape the group. Norm Rimmer, who is today 87, remembers that "We all realized that our main competition was other forms of construction. We just wanted a chance to bid on more projects because we knew we had a good solution."

One important task was to evaluate the application of design loads that varied considerably between codes. The Technical Committee looked at all the available research and data and combined this with their collective wisdom to eventually publish the influential state-of-the-art MBMA Recommended Design Practices Manual that sold for one dollar in 1959. However, it was apparent in assembling this first manual that MBMA would have to consider sponsoring new research to be able to advance the industry.

At a Technical Committee meeting early in 1960, it was agreed that MBMA would have to sponsor research that would serve as the basis for future recommendations. For the next few years, however, MBMA Technical Committee members provided their expertise on several ongoing projects sponsored by others. For example, the American Iron and Steel Institute (AISI) sponsored work at Cornell University that led to the publishing of Design of Light Gage Steel Diaphragms in 1967. This landmark publication acknowledges the cooperation of MBMA and the Steel Deck Institute in the research program. AISI also began sponsoring research at Cornell on purlin uplift capacity.

MBMA INITIATES SPONSORED RESEARCH PROGRAM

MBMA first co-sponsored a major research project in 1966. This project was a study on tapered structural members that was conducted at the State University of New York at Buffalo by Dr. George Lee. Other sponsors were the U.S. Naval Facilities Engineering Command, American Institute of Steel Construction (AISC), and AISI. A joint task committee of the Column Research Council (now the Structural Stability Research Council) and the Welding Research Council was established to facilitate the study. This began a 15-year MBMA association with Dr. Lee and his tapered member research that led to the notable book, Design of Single Story Rigid Frames, published by MBMA in late 1980.

Don Johnson, now a consultant who retired from Butler Manufacturing in 1996, and who was a two-term MBMA Technical Committee chairman, headed the MBMA subcommittee that helped guide this research. Johnson recalls that, "it was a very complex problem, requiring Dr. Lee to come up with a very complex solution; but this helped advance our knowledge of the behavior of tapered members, particularly with regard to geometric limits on the taper."

The ultimate goal with any research is to positively influence the building codes or material specifications. Supplement No. 3 was released in 1974 for the AISC Specification that added Appendix D on Tapered Members that was based on Dr. Lee's research. This validated the work and provided an optional method to the designer when tapered members are used. MBMA is currently sponsoring the development of an AISC/MBMA Tapered Member Design Guide, which will provide design practices that are consistent with the 2005 AISC Specification, but suited to today's computer methods of design.

DIRECTOR OF RESEARCH & ENGINEERING

In the mid 1970s, it became difficult to conduct the technical activities of MBMA solely with the volunteer manpower of the member companies. The board opened a search in 1974 to appoint a full-time director of research and engineering. According to Lyle Wilson, formerly with American Buildings and MBMA Technical Committee chairman from 1972 to 1974, "We were looking for someone with metal building industry experience and preferably, someone with a Ph.D. who would be able to help us with the research program."

Following a lead, Lyle Wilson and Pete Peterson, who was with Thomas Associates, met Duane Ellifritt in Tulsa to discuss the position. Dr. Ellifritt, who had been an engineer at Armco for ten years and was currently on the faculty at Oklahoma State University, jokingly remembers that "We met in a dry county, so it was a pretty sober meeting." But, the meeting must have gone well, because the position was offered, and when the timing was right for his family, Dr. Ellifritt came on board in June 1975.

This decision to hire a full time director of research and engineering came at an opportune time, as the wind research effort was being pulled together. Dr. Ellifritt became a key player in one of MBMA's most significant research undertakings. He served in this capacity until 1984, when he returned to academia at the University of Florida. He did an outstanding job of getting the organization moving forward with an aggressive research program and in serving as the industry technical spokesman and liaison for nine years.

Dr. Dale Perry, of the University of Idaho,

was hired to follow Dr. Ellifritt, serving in that capacity until 1988. Dr. Perry had been the principal researcher for an MBMA project on the thermal movement of roofs that involved field measurements at Garco's metal building plant in Spokane, WA.

Gill Harris became the third director of research and engineering in 1988 and brought many years of industry knowledge to the position, especially with his long involvement with wind engineering and standards. He worked with different metal building manufacturers over the years – mostly with Mitchell Engineering Company (now Ceco Building Systems). Instead of a Ph.D., Harris had a master's degree from Rice University, but he brought genius to the position, as documented by his Mensa membership.

Harris attended his first MBMA Technical Committee meeting, representing Mitchell Engineering, in 1962 after having worked on the wind load recommendations in the first MBMA Manual in 1957 while at Metallic. He went on to attend 97 MBMA Technical Committee meetings in addition to serving as chairman from 1975 to 1977. He is currently serving as a consultant to the industry by lecturing, testing, designing and providing wind damage investigations.

"It is a wonderful and gratifying experience to be associated with the metal building industry which has been willing to devote its resources to the advancement of wind engineering, in addition to other structural disciplines, not just selfishly but to the enhancement of the building codes and standards," said Harris

Harris retired from MBMA in 1994, and that is when I came on board. Then in 1996, recognizing the importance of additional full-time staff to complement the work of the volunteer members, MBMA hired a second engineer. Dan Walker, PE, has been a solid asset to the association in this role.

SIGNIFICANT RESEARCH CONTRIBUTIONS

There are many research accomplishments that advanced the state-of-the-art in metal building design, improved building codes and specifications, and established MBMA as a technical leader. The following are some of the more notable achievements.

Wind Load Research

In 1974, when the model building codes indicated interest in adopting the wind loads from the American National Standards Institute (ANSI) A58.1 Minimum Design Loads for Building and Other Structures (which became ASCE 7 in 1988), MBMA decided it was time to enact their plan to sponsor wind load research aimed at settling the differences in the various standards. Especially since the ANSI standard was completely based on testing of high-rise buildings and was inappropriate for low-rise applications. Until MBMA became involved, there was little concern about this from others. It is important to note that this was not just a metal building issue, it was a low-rise building issue, and the research had far reaching impact.

MBMA representatives, led by Stephen Jones of Cuckler Building Systems, met with two of the leading researchers in the field of wind load design at the world's best boundary layer wind tunnel programs. They were Dr. Jack Cermak of Colorado State University and Dr. Alan Davenport of the University of Western Ontario. Ultimately, it was decided that the University of Western Ontario was the best match in that UWO was already engaged in some related research on low-rise structures.

This pioneering work launched the first comprehensive investigation of wind action on low-rise buildings, which recognized both the importance of boundary layer flow and the action of turbulence. In 1976, additional sponsors joined the effort - AISI, and the Canadian Steel Industry Construction Council. The task of trying to codify the extensive database of wind tunnel results for low-rise buildings was a very difficult one. But this is where Dr. Davenport's UWO team and MBMA may have made their greatest contribution.

The hard work finally paid off, when the Standard Building Code (SBC) first adopted the wind loads developed by Dr. Davenport's team. This was included as an alternate procedure in the 1982 SBC, which was notable since this code governs the design of buildings along most of the hurricane coastline in the United States. Then, in the 1986 SBC, these provisions became mandatory for low-rise buildings because of the improved performance of buildings designed to these provisions. The American Society of Civil Engineers Standard, Minimum Design Loads for Buildings and Other Structures (ASCE 7) finally made revisions in their 1995 edition, introducing the UWO primary framing loads for low-rise buildings.

The wind load research was undoubtedly the most successful technical endeavor undertaken by MBMA. Harris reflects, "From MBMA's beginning in 1956 it has taken the lead in this field by using wind tunnel based designs while most of the engineering community was still practicing with wind on total vertical projection." In Dr. Ellifritt's annual report to the MBMA Board of Directors in 1979, he stated "It is the consensus of the Wind Subcommittee, the Technical Committee, and qualified professionals, that this research is a quantum leap in the knowledge of the action of wind on low rise buildings. If anyone questions the relevance or accuracy of this research, all that has to be done is review the damage caused by Hurricane Frederic in Mobile, AL this fall. Edge strip, corner strip, and end-frame loading were clearly demonstrated by the damage that occurred in buildings designed to previous standards."

MBMA is still on the wind engineering forefront today. In connection with the National Institute of Standards and Technology, MBMA is advancing the state-of-the-art in wind engineering design with the virtual wind tunnel, which is intended to give the designer the equivalent of a wind tunnel at the computer through a digital database.

Bolted End-Plate Connections

The metal building industry, with MBMA's leadership, pioneered the use of bolted end-plate connections in the United States. This was in large part due to the research program that established the design procedures that have been adopted for this type of connection. MBMA began sponsoring research in 1971, when Dr. Krishnamurthy of Auburn University was selected to conduct the study on bolted end-plate moment connections that was cosponsored by AISC. Dr. Krishnamurthy later moved on to Vanderbilt University and to the University of Alabama – Birmingham, but the MBMA research continued under his direction at those institutions as well.

The impetus for this research was a design example included in the 7th edition of the AISC Manual of Steel Construction, which would have required end plates at least twice as thick and bolts of larger diameter than those being used in metal building applications. This was because it was based on simplifed design assumptions and analyses of the connections.

Dr. Thomas Murray of the University of Oklahoma and Virginia Tech followed Dr. Krisnamurthy's work for MBMA in 1982 to develop a new approach aimed at unifying the design approach for the most common end-plate connections utilized in the industry. Comparisons of test data to his design theory proved that this method produced accurate results, yet economical designs. The culmination of this work was realized in 2002 with the publication of the AISC/MBMA Design Guide No. 16. This is now the recognized standard for bolted end-plate design and serves the industry well.

Cold-Formed Steel Research

Since the mid-1960's, MBMA has been involved in improving the performance and efficiency of cold-formed steel, primarily metal roofing systems, through advances in AISI's Specification for the Design of Cold Formed Steel Structural Members. Early research was

conducted at Cornell University, under the direction of Dr. George Winter and was sponsored by AISI, with MBMA serving in an advisory role.

The Cornell tests were performed on simple span C and Z-beams, with and without diaphragm bracing, for both uplift and gravity loads. Good correlation was achieved between the test results and their computer model predictions, except for the case of diaphragm braced beams for gravity loads. In this case, the actual tested capacity was considerably higher than the predicted values. Unfortunately, specific design recommendations were not finalized before the work by AISI came to an end. This is where MBMA stepped forward and sponsored additional work by Dr. Teoman Pekoz at Cornell to complete this important component of the research.

In 1980, MBMA recognized that it was increasingly necessary to look at the roof as a system with regard to purlin design for gravity and uplift loads, expansion and contraction behavior, and the impact of insulation. In fact, for purlin design, 22 separate roof system parameters were listed by the Technical Committee that could affect the behavior. Since it was expected that the work of Dr. Pekoz would lead to a design procedure for uplift, the new focus was to do more research for gravity loading.

MBMA selected Dr. Murray to begin the research on the behavior of roof systems under gravity loads in 1981. The objective of the research was to determine the quantitative effects on roof systems of such devices as sag members (intermediate braces), anti-roll clips, roof diaphragm, end anchorage of panels, and the effect of various insulation schemes on the ultimate load capacity under gravity loads.

As Dr. Murray's research continued on gravity loaded purlins, the appropriate AISI provisions for uplift continued to evade consensus. It was hoped that a solution could be reached for inclusion in the 1986 AISI Specification, but discrepancies between the theoretical capacities and the test results of continuous purlins forced AISI to table any revision until a reasonable solution could be reached. It was felt that the discrepancies existed because the Cornell method, verified with simple span tests, could not be extrapolated to a continuous purlin system. MBMA accepted the task of undertaking further research to try to settle the matter.

Dr. Murray's work finally yielded a solution, whereby a simple span test could be used to predict purlin capacity in a continuous span system. This test came to be known as the Base Test and was adopted into the 1996 AISI Specification. This has been hailed as a breakthrough which finally solved the purlin capacity impasse. Maury Golovin, now retired from Ceco Building Systems, and the MBMA Technical Committee chairman in 1994 and 1995, was instrumental in translating this research from the laboratory into the AISI Specification.

Snow Load Research

MBMA pioneered the understanding of snow load accumulations on a roof with the publication of the 1974 MBMA Metal Building Systems Manual. This included drifting snow on stepped or multi-level roofs, drifting snow against roof projections, valley accumulations, and sliding snow phenomena. While these design guidelines were not based on MBMA sponsored research, they were the result of extensive reviews of other country building codes as well as observations of snow accumulations on roofs. MBMA's leadership in this area led to other's taking a closer look. Similar provisions were adopted in the 1982 ANSI A58.1 and then in the1987 BOCA National Building Code.

More recent research was sponsored by MBMA that evaluated drifting snow across the ridge of a low-slope gable roof because it was observed that this phenomena was not properly addressed in the building codes. Dr. Michael O'Rourke of Rensselaer Polytechnic Institute was selected as the principal researcher on several projects beginning in 1995. These projects led to code changes in ASCE 7 that now require the evaluation of drifting snow across the ridge of a low-slope building when the roof slope is greater than ½ on 12, where this was previously not required on roofs with a slope less than 15 degrees.

Wind Uplift Tests (Static vs. Dynamic)

The UL 580 test that had been introduced in 1973 was a success in improving the performance of roofing assemblies by evaluating them in a simulated wind event. But this test was not designed to predict the actual uplift resistance. In 1988, ASTM began the development of the E1592 wind uplift resistance test. One advantage of this test was that it used a larger roof specimen, which is now recognized as a better test for standing seam roof systems. However, both of these tests utilized a uniform static air pressure over the roof specimen which does not represent true wind behavior. The real interaction of wind and structure is known produces wind loads that vary dramatically from one instant to the next, and over very short distances, on the roof surface.

MBMA initiated an effort in the late 1980's to try to better predict the actual performance of metal roofing against high wind uplift forces. This research effort was multi-pronged because there were several good ideas on how to approach this difficult problem. Projects at the University of Western Ontario, Clemson University and Mississippi State University (MSU) were initiated, with MBMA and AISI as initial cosponsors. After several years of evaluating the proposed methods, MBMA decided that the MSU effort, under the direction of Dr. Ralph Sinno, showed the most promise.

A full-scale assembly of a metal roof corner was constructed and tested at MSU using the standard ASTM E1592 protocol to obtain the static uplift resistance. Then, a dynamic test using a grid of 34 electromagnets was used to simulate the actual non-uniform wind behavior. The electromagnets were programmed to reproduce independent time-history traces obtained from the detailed UWO wind tunnel analysis. The simulated wind event was based on Hurricane Andrew. Load cells were placed at selected standing seam clip locations for both the static ASTM E1592 test and the dynamic electromagnetic wind simulation. The clip loads in both tests were evaluated to determine the true load that was being imparted to the roof system.

The UWO solution to the problem provided a backup plan and became an excellent corroboration of the MSU study results, even though it used a completely different approach. Tests were performed on identical models; first in the wind tunnel under simulated wind loading conditions and then again, using elaborate models designed to reproduce full-scale test procedures. This provided a direct correlation between the real (wind tunnel) loads and the simulated roof systems; while conversely, the MSU project used real full-scale roof systems with simulated wind loads. Between the two projects, we were able to learn how to predict the true performance of metal roof systems under real world conditions.

Dr. David Surry and Dr. Eric Ho of UWO took the lead in combining the results from the MSU project with the results of the UWO research into a summary journal article which has been completed and submitted to the ASCE Journal of Structural Engineering. It was found that the E1592 uniform pressure test contains conservatism of about 50% for the roof system tested by both approaches; and up to about 80% for the other roof systems tested only at MSU. Conservatism arises if the roof system is required to withstand the code recommended pressure applied uniformly in the E1592 test. This does not take into account the reality of the dynamic spatially-varying properties of the wind-induced pressures. A proposal has been presented to the AISI Specification Committee to support the adoption of a 50% increase in standing seam roof wind uplift strength over the E1592 static test result.

This was a significant research undertaking, both in its complexity as well as in the potential benefit of recognizing the true uplift resistance of standing seam roofs. It also demonstrates the cooperative efforts that are needed to solve complex issues. In addition to MBMA and AISI, the Metal Construction Association joined the effort along with Factory Mutual. Collaborations like this are an indication of the close working rela-

tionship MBMA has with other steel industry groups and the confidence they have in joining with MBMA to tackle difficult technical challenges.

INSURANCE ISSUES AND FIRE RATINGS

MBMA also became involved early on with insurance issues, particularly to work toward more equitable rates for metal buildings. Butler's R. J. Atkinson was the first Insurance Committee chairman. His committee met in 1958 to lay the groundwork for many continuing programs. In the 1960s, the Insurance Committee began working, in conjunction with AISI, on fire protection and fire ratings for metal buildings. In 1963, the first Insurance Facts Booklet was published by MBMA, with the help of C.W. Schirmer of Schirmer Engineering Corporation. This was followed in 1971 with the publication of MBMA's Insurance Bulletins, which still serve as the primary vehicles to distribute information on the fire rating tests that have been sponsored by MBMA as well as other insurance information.

The impetus for MBMA to develop new fire rated assemblies throughout the past three decades was in part due to the expanded use of metal buildings in applications with new fire protection requirements. Beginning in the 1980's, fire ratings were obtained for ceiling assemblies utilizing gypsum board as well as suspended acoustic tiles. The Insurance Committee continues to sponsor fire rating tests and evaluate new construction assemblies to enable metal building systems to meet and sometimes exceed building and fire code requirements.

THE "SPECIAL BREED"

The technical excellence and leadership that has been the hallmark of MBMA for 50 years is mostly attributable to the remarkable individuals who have helped guide the association. We have highlighted some individuals in this article, but there were many more, especially all of the Technical Committee chairmen noted in the sidebar. The Technical Committee has always fostered a tremendous mentoring atmosphere, to take advantage of the knowledge of the senior leadership while passing the torch to younger members.

As noted by Dr. Ellifritt, "Engineering a more or less standardized product, which has many competitors, requires a different mind set than that required of the consulting engineer. I don't think this fact is always appreciated by the general engineering community. MBMA engineers are a special breed!"

MBMA's Research Leader

In a candid interview with Lee Shoemaker, he spoke on some of the highlights of his current tenure as director of research and engineering for MBMA.

What brought you to MBMA?

A: In 1994, I saw MBMA's ad for a director of research and engineering. I had MBMA's wind loading primer on my bookshelf and was well aware of their leadership in wind engineering. It's been a good fit with my experience in design and research and there are always new challenges that keep me excited. To date, I've managed and coordinated over 50 research projects.

What MBMA project has brought you the most pride?

A: One of my proudest accomplishments is the Seismic Design Guide for Metal Building Systems that MBMA published in 2004. There have been attempts from many others to develop a seismic design guide, but our plan to bring together the leading seismic experts to address specific issues with metal buildings produced an exceptional document – many engineers outside the industry have commented to me that it is one of the best seismic guides available.

What is most satisfying about your work at MBMA?

A. My biggest satisfaction is helping to change the industry image. I represent MBMA on technical committees of the AISC, AISI, ASTM and ASCE. Without such representation, metal building systems could be overlooked or inaccurately portrayed in code and specification documents. Also, some engineers didn't appreciate the engineering expertise of our members. But since we've become more proactive in national and international code and committee work, there has been a definite change in attitude. Before, people would not seek out MBMA's opinion or try to work with our organization. Now, that's changed considerably. When we go to meetings, we're on an even status with others around the table. Engineers from all over the world respect our accomplishments.

MBMA's Technical Committee Chairmen

Robert Blickensderfer	Armco	1957 – 1962
Norman Rimmer	Butler Manufacturing	1962 – 1971
Lyle Wilson	American Buildings	1972 – 1974
Gilliam S. Harris	Mitchell Engineering	1975 – 1977
William Sontag	Pascoe Steel	1978 – 1980
John Rave	Inryco	1981 – 1983
Donald Johnson	Butler Manufacturing	1984 – 1986
Joe Nunnery	AMCA Buildings	1987 – 1989
J. Walter Lewis	Kirby Buildings	1990 – 1991
Donald Johnson	Butler Manufacturing	1992 – 1993
Maury Golovin	Ceco Buildings	1994 – 1995
Joe Nunnery	Varco Pruden	1996
J. Walter Lewis	Kirby Buildings	1997 – 1998
Barney Ruble	Steelox Systems	1999
Mark Radmaker	Garco Buildings	2001 – 2002
Eric Masterson	NCI Buildings	2003 – 2004
Scott Russell	Nucor Buildings	2005 – 2006

The Energy Edge

Today we must be mindful of the total building envelope from a structural, as well as an energy savings point of view. MBMA is dedicated to the Green Building Movement's practices of reducing each building's impact on human health and environment through better design, construction, operation, and maintenance throughout the life of the building. That's why the MBMA board created a standing Energy Committee that is focused on fair and equitable treatment of metal building systems by energy codes, standard organizations, testing and rating groups, and other governmental and non-governmental groups.

Even before developing the energy committee, MBMA was one of five associations who created the Cool Metal Roofing Coalition, and is currently chairing the organization. Most recently, MBMA conducted training seminars pertaining to energy issues throughout California and partnered with the Cool Metal Roofing Coalition to train the California Association of Building Energy Consultants (CABEC) members, architects, and engineers in California on June 28 and 29.

METAL BUILDING SYSTEMS MANUAL

MBMA's Metal Building Systems Manual is the industry-standard design manual for architects, manufacturers, engineers, specifiers, builders and other professionals involved in the metal building systems industry. MBMA plans to release a completely updated edition of the manual in September, 2006. The new manual will include the IBC 2006 provisions related to metal buildings, as well as updated wind, snow, seismic and rainfall intensity loads for all counties in the U.S.

The current manual's sections cover: Load applications (IBC 2000 loads); crane loads; serviceability; common industry practices; guide specifications; AISC-MB certification; wind load commentary; fire protection; wind, snow and rain data by U.S. county; glossary. It provides significant commentary on International Building Code (IBC) 2000 loads including recommendations on applying them to metal building systems. The manual also contains a complete CD-ROM version, which is both hyper-linked and searchable.

METAL ROOFING SYSTEMS DESIGN MANUAL

The Metal Building Manufacturers Association is also the publisher of the Metal Roofing Systems Design Manual - a one-of-a-kind design and detail manual for architects, manufacturers, engineers, specifiers, builders and others involved in the metal roofing industry. For over two years, a team of MBMA roofing systems members and association staff worked to develop the manual. It includes: systems components, substrates, specifications and standards, retrofit, common industry practices, design, installation, energy and fire protection.

Perhaps the most labor-intensive aspect of the manual was the selection of the metal roof details. According to Dan Walker, P.E., MBMA staff engineer and project manager for the Metal Roofing Systems Design Manual, the team began with over 700 roofing details provided by MBMA members. After several months and multiple committee meetings, the team developed approximately 90 generic details for easy reference. The challenging part of this process was that all of the details that appear in

the manual needed to be representative of the common practices for the industry. Details at mbma.com (click on Bookstore).

The Metal Roofing Systems Design Manual focuses on standing seam metal roofing systems and serves as both an educational tool and a design aid for professionals working with these materials. The purpose of the details and provisions of the manual is to educate professionals about the proper specification, design and installation of metal roofing systems. "We set out to develop a manual to help upgrade the design practices of the metal roofing industry, and we feel confident that we have accomplished that goal," Walker said.

Details at mbma.com (click on Bookstore).

MBMA Influences Industry Growth

Thanks to the efforts of MBMA and its members, metal building systems sales have risen dramatically during the past 35 plus years, when annual sales were first recorded. In 1960, sales were estimated below $1 million. Industry shipments were $2.54 billion in 2005 and are forecasted to grow even higher in 2006. This figure is indicative of how building owners, engineers, architects and others in the specification community have embraced the durability, utility and life-cycle cost advantages associated with using metal building systems for low-rise, non-residential buildings.

Other factors that demonstrate the popularity of metal buildings include steel shipments, recorded at January 4, 2005, of 400 million tons. The industry had a minimum of 400 million square feet of buildings put in place during 2005. Typically, metal buildings represent 15-20% of a total construction project so the industry impacted over $11 billion in total construction of low-rise construction.

A breakdown of MBMA member's 2005 sales by end-use categories include: 42% commercial buildings; 25.5% manufacturing buildings; 17.7% community facilities and 15.1% miscellaneous projects.

MBMA's High-Impact On Low-Rise Construction

MBMA has made numerous contributions to the industry in its first 50 years.

In the beginning, the industry faced many building code challenges, both local and national, and was plagued by many restrictions and insurance requirements. Early on, the industry was hampered by a number of forces including union conflicts and jurisdictional disputes. All these areas needed to be convinced of metal's viability as a product and MBMA helped to pave the way.

The association has also helped to cultivate the relationships between the manufacturer and the builder/dealer, a relationship that has worked well for both parties. The manufacturer has a dependable outlet for his product and is willing to provide training, marketing support and direction. The builder knows he has single-source responsibility with people he knows. This marketing concept has proven successful as the industry has been able to respond to market demands and changes.

In the early days, the product did not look as sophisticated as it does today. Therefore, it was not readily accepted by architects and engineers. Conquering this image was perhaps the greatest challenge faced by the industry. The image began to fade when manufacturers sharpened their skills to shape steel and other materials into attractive, functional and economical structures. Much of the change in the industry is due to the new aesthetics in systems architecture—sweeping expanses of glass, dramatic overhangs, cantilevered designs and attractive fascia. Softer, more neutral colors in paint selections make it easier for architects to combine metal panels with brick, stone, concrete and wood. MBMA has been in the forefront of campaigns to promote the economy, durability, and aesthetics of metal building systems through education, advertising, speaking engagements, brochures, direct mail and other promotional investments.

Perhaps the largest contribution of MBMA has been the ability to provide a united group, promoting the industry's philosophy of systems' integrity to meet the needs of the marketplace.

MBMA Technical Timeline:
Industry-Changing Events Through Five Decades

1956

December – MBMA was organized into an industry association and held its first annual meeting in Chicago, IL.

1957

April – Inaugural MBMA Technical Committee meeting in Chicago, IL.

Insurance Committee met in Chicago….. The Insurance Committee had been formed by MBMA to address the effects of insurance rates on construction. Butler's R. J. Atkinson was the first chairman and his committee laid the groundwork for many continuing programs.

1959

MBMA published "Recommended Design Practices Manual". It had 27 pages and sells for one dollar.

MBMA published "Code of Standard Practice".

1960

MBMA member sales had grown from $69.6 million in 1956 to $98.9 million in 1960.
Steel shipments were in the range of 260,000 tons. Market share was 20% of low-rise, non-residential construction. MBMA had 16 members with 23 plants, and a total of 1,000 dealers. The typical end product at this time was under 10,000 sq. ft. and in 1960, agricultural users accounted for 34% of total MBMA shipments. The remaining 66% went into commercial, industrial and other uses.

Insurance Committee first discussed the concept of fire-protection for metal buildings.

1961

MBMA became active in advising AISI on a research project they were carrying out at Cornell University, under the direction of Dr. Winters, on Diaphragm Action in Roof and Wall Panels.
In 1962, MBMA was involved in the first UL-approved roof, which lowered insurance costs for years to come.

1962

Norm Rimmer of Butler begins 10-year tenure as Technical Committee chairman.

1963

MBMA published "Recommended Guide Specification" and "A Primer of Wind Loads on Gable Roof and Flat Roof Buildings".

First "Insurance Facts" booklet was published by Committee on Insurance Matters (written by C. W. Schirmer of Schirmer Engineering Corporation).

1964

MBMA began the development of a roofing weather tightness test that included both a wind-driven rain evaluation and an ice damming test with the roof subjected to standing water.

1966

MBMA first cosponsored a major research effort. Dr. George Lee of the State University of New York at Buffalo investigated the behavior of tapered members in a project jointly funded by the U.S. Navy, AISC, AISI and MBMA.

MBMA compiled information on the thermal properties of insulation, recognizing that energy conservation was becoming more important

1967

AISI published "Design of Light Gage Steel Diaphragms" with the cooperative efforts of MBMA and SDI.

MBMA's Technical Committee was involved in helping Underwriters Laboratory develop an uplift test that became the precursor to UL 580.

1968

MBMA established the Purlin Uplift Subcommittee and began assessing research needs and available test data.

1969

The MBMA board directed the Technical Committee to prepare a list of research projects that might be undertaken by the association

"which could lead to major breakthroughs for the industry." The prioritized list of projects were: (1) Fire Protected Walls and Columns, (2) End Plate Moment Connections, (3) Diaphragm Action, (4) Lateral Support of Tapered Members, and (5) Major Axis Buckling

1970

By 1970, MBMA had grown to 25 members with 40 plants, and the number of builders/dealers had tripled to 3,000. Percentages for end use of products were: commercial and industrial, 36% each; agricultural, 10%; community, 8%; and miscellaneous, 10%.

MBMA statistics showed that manufacturer sales in 1970 were $363 million. Steel shipments grew to 659,000 tons and market penetration in the low-rise, non-residential segment of construction increased from 20% to 30%.

AISI first evaluated the use of limit states design that was gaining momentum in Europe and MBMA provided assistance.

1971

MBMA published "Metal Building Systems Manual" – with Recommended Design Practices, Recommended Guide Specifications and Metal Building Systems Nomenclature.

Professor Sanger of Texas Tech conducted a study for MBMA on "Response of Metal Buildings to Tornadic Winds" based on observations after the Lubbock, TX, tornado. This was the beginning of many field investigations that would provide insight into metal building performance.

MBMA provided funding and research for the First Specialty Conference on Cold-Formed Steel Structures hosted by the University of Missouri-Rolla.

MBMA commissioned Dr. Krishnamurthy of Auburn University to conduct the research on bolted end-plate moment connections. He proposed using finite element analysis which was relatively new and only commonly used in advanced aerospace applications. AISC agreed to co-fund the project.

MBMA published first Insurance Bulletins.

1972

Technical Committee began inviting leading researchers to make presentations at meeting, such as Dr. George Winter and Dr. George Lee.

ANSI A58.1-1972 was published but did not have appropriate wind loads for low-rise buildings. This gave incentive for MBMA to get involved in research and building code adoption of wind loads.

MBMA provided additional funding so that Dr. Pekoz of Cornell could complete the work on bracing requirements for C and Z members attached to sheeting.

1973

A vertical rib and trapezoidal standing seam roof system was introduced in the early '70s, increasing architects' interest toward metal. Standing seam roof systems also began to come into prominence. They offered greater energy efficiency and water tightness by elevating the roof seam above the water plane and eliminating fasteners through the panel.

New design and manufacturing techniques made possible structures of increased strength-to-weight ratios, using members with lighter cross sections and higher strength steel. Energy savings were added with the factory-insulated sandwich wall panel, giving low U-values and further attracting building designers and owners.

1974

In 1974, MBMA formed a Mill Relations Committee with William Slaton Sr. of Delta Steel Buildings Company as chairman.

MBMA began discussions with leading researchers on carrying out wind tunnel research –Dr. Alan Davenport of University of Western Ontario (UWO) was selected to begin the work.

MBMA hosted first Researcher's Meeting to have all researchers present their findings and to have interchange with the Technical Committee.

MBMA began deliberations on AISC's new Certification Program and how that might benefit the industry.

Supplement No. 3 was released for the AISC Specification that adds Appendix D on Tapered Members that was based on Dr. George Lee's work, cosponsored by MBMA. The use of Appendix D is optional to the designer but can result in significant savings in material when tapered members are used.

MBMA successfully performed column fire tests. Also in this year, the name of the committee was changed from "Committee on Insurance Matters" to "Committee on Fire Protection and Related Insurance Matters".

1975

MBMA hired a full-time director of research and engineering, Dr. Duane Ellifritt from Okalahoma State University.

MBMA awarded UWO a $15,000 contract to begin wind tunnel studies.

MBMA/TIMA Subcommittee met to review energy issues in California. A pending California senate bill was being followed closely that would impact the amount of insulation required in a metal building (early Title 24 development).

1976

First meeting of MBMA's Certification Committee to evaluate the need for developing criteria to be used in the AISC program, covering metal building systems and to develop recommended criteria for board review.

1977

New project on roof expansion/contraction was funded that included field measurements at one of MBMA members' manufacturing facilities (Garco).

First MBMA Design Workshop was held in conjunction with the Technical Committee meeting.

MBMA sponsored a Wind Research Symposium at UWO and invited building officials and consultants to learn more about the ongoing research and plans for codification.

The 1/3 allowable stress increase was coming under growing scrutiny, prompting MBMA's Duane Ellifritt to author "The Mysterious 1/3 Stress Increase", published in AISC's Engineering Journal. It provided one of the most thorough documentations to its origin and justification.

1978

MBMA research on the amount of residual stress in welded columns was begun by Dr. Avent at Mississippi State University. There were suspicions that higher residual stresses could reduce the column capacity over similar rolled sections, but this project eliminated that concern as far as typical metal building columns are concerned.

MBMA completed work at Midwest Research Institute that showed that the mass effects of masonry walls was not as influential in reducing energy costs when all the factors were considered, including setback thermostats.

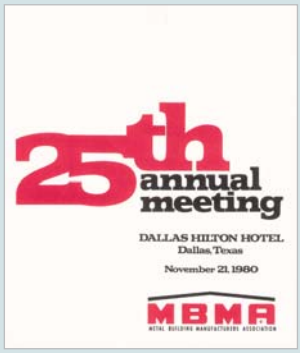
1979

Heavy snows in recent winters in the Chicago area caused failures to all types of construction, including metal buildings. MBMA initiated a Roof System Behavior project to address gravity loads and purlin roll forces by looking at the entire system effect, including roof insulation.

1980

MBMA sales in 1980 were over $1 billion dollars, compared to $323,000,000 a decade earlier. Member steel shipments were in excess of 1 million tons. In 1981, MBMA had 35 members operating 74 plants in the United States and 10 overseas. There were 8,800 independent dealer/builders.

MBMA published "Metal Building Systems" in conjunction with the Metal Building Dealers Association.



The MBMA Technical Committee formed the Code Action Subcommittee to be better organized and influential with the growing number of state and local codes that were offshoots of the three model building codes.

First MBMA graduate fellowship is awarded to a student at the University of Wisconsin – Milwaukee for anchor bolt research.

1981

MBMA selected Dr. Tom Murray at the University of Okalahoma to begin researching the behavior of roof systems under gravity loading. The two-year study began with an analytical procedure, followed by four full-scale purlin tests – two with simple spans and two with intermediate braces.

MBMA organized a Metal Building Symposium coordinated by the University of Wisconsin – Madison. Featured speakers were Dr. George Lee, Dr. Teoman Pekoz, and Dr. Jim Fisher.
MBMA published Dr. George Lee's seminal work on the tapered member research entitled, "Design of Single Story Rigid Frames."

1982

MBMA published "Crane Manual for Metal Building Systems".

The Southern Building Code adopted MBMA/UWO wind loads as an alternate procedure.

1984

Dr. Dale Perry of the University of Idaho, who had been the principal researcher on the roof thermal expansion project, replaced Dr. Ellifritt as MBMA's director of research and engineering. Dr. Ellifritt left to accept a faculty position at the University of Florida.

1986

MBMA aggressively pursued an MB category of AISC Certification, setting up a committee to put together a working program.

MBMA began research on snug tight bolts, cosponsored by RCSC and AISC.

1987

MBMA members (Butler and American) contributed building and turntable for a Texas Tech project to measure actual wind loads on a building that can be rotated based on wind direction.

UL Grants MBMA UL Design No. P516, based on engineering evaluation of a combination of AISI roof/ceiling tests and a small scale MBMA test.

1988

Gill Harris became MBMA's director of research and engineering, bringing many years of industry knowledge to the position, especially with his long involvement with wind engineering and standards.

1989

MBMA sponsored Wind Engineering Seminar at the University of Western Ontario for building officials and standard writers.

MBMA sponsored a study by Dr. James Fisher on serviceability of low-rise buildings that would become the basis for AISC Design Guide No. 3.

1990

MBMA published updated "Metal Building Systems" in conjunction with the Building Systems Institute.

MBMA participated in the first RICOWI meeting organized by Oak Ridge National Laboratory.

1991

MBMA began ambitious research projects to develop a dynamic wind uplift test evaluation for roofing. Projects at UWO, Clemson, and Mississippi State were funded to address different aspects of the problem.

ASTM A529, Grade 50 steel is adopted as standard, based largely on the work of Don Johnson and MBMA.

1992

Full scale metal building at Texas Tech is instrumented and wind load data was collected to compare to wind tunnel models. MBMA was a cosponsor of this project.

MBMA research was completed that will reduce the lap requirement for cold-formed C's in the AISI Specification.

Hurricane Andrew struck southern Florida and impacted construction and building codes. This led to a series of MBMA test modeling programs.

1993

Dr. Ellifritt of the University of Florida completed a study comparing primary frames designed to LRFD and ASD Specifications, concluding that there is not much difference in the total frame weight.

1994

Dr. W. Lee Shoemaker was hired as MBMA's director of research and engineering

Northridge Earthquake struck Southern California and lead to significant seismic design changes in the building codes.
1995
MBMA and Armstrong World Industries successfully completed a full-scale roof/ceiling test using suspended acoustical ceiling tiles.

MBMA was successful in getting BOCA to accept deflection limitations for members supporting metal cladding that is consistent with other model codes.

1996

The Base Test was incorporated into the 1996 AISI Specification, culminating many years of MBMA-sponsored research to determine the amount of lateral support that a standing seam roof provides to supporting purlins.

MBMA helped fund a research project by Dr. Roger Laboube at UMR which resulted in a 30% increase in Z purlin web crippling capacity and was incorporated into the 1996 AISI Specification.

MBMA published the 1996 Low Rise Building Systems Manual, in binder format for the first time.

1997

MBMA published the first compilation of ASTM standards for metal building systems.

AISI published the Standing Seam Roof Design Guide, the development of which was co-sponsored by MBMA.

MBMA reinstated the Graduate Fellowship Program and awarded a fellowship to a student at the University of Connecticut.

The Research Council on Structural Connections approved the use of snug tight bolts in low rise

building applications where there is not an overhead crane. This was based on research sponsored by MBMA.

1998

MBMA sponsored a seminar on the design of purlins supporting standing seam roofs presented by Dr. James Fisher and Dr. Roger LaBoube.

AISI published the Panel Design Guide that was co-sponsored by MBMA.

Dr. Murray of Virginia Tech began seismic testing of end-plate connections for MBMA in response to new Northridge earthquake requirements.

1999

MBMA joined with AISI, NCCA, MCA, and NamZac to sponsor cool roof research at ORNL.

2000

First International Building Code was published, which integrated the three model codes into a single code and MBMA began a comprehensive study of the code to determine its impact upon metal building systems.
MBMA began to assist NIST to develop a computer database of wind tunnel data that could become the next generation of wind engineering.

The first Annual Report of MBMA Technical Research Activities was published that summarized all ongoing projects with their objectives and status.

2001

MBMA published the first Metal Roofing Systems Design Manual with industry-approved metal roofing details.

The AISC/MBMA Design Guide No. 16 on bolted end-plate connections was a milestone publication that was the culmination of many years of MBMA-sponsored research on these types of connections.

MBMA research was completed by Dr. Murray of Virginia Tech that substantiated that washers are not required for slotted holes in purlin laps. This was adopted into the 2004 AISI Supplement.

2002

MBMA published 2002 Edition of the Metal Building Systems Manual (changing name from Low Rise Building Systems Manual) and incorporated load requirements from IBC 2000.

Dr. Shoemaker made a presentation at a UWO Symposium honoring the 40 years of wind engineering contributions of Dr. Alan Davenport, focusing on the MBMA collaboration with UWO over the years.

MBMA joined the Cool Metal Roofing Coalition, composed of AISI, MCA, NCCA, and NamZAC.

MBMA looked to the future and commissioned former Clark County Building Official and chair of ICC's Performance Based Design Committee to prepare a white paper on the performance-based design of metal building systems.

2003

MBMA Graduate Fellowship project at Rensselaer Polytechnic Institute determined that snow does not drift over the ridge of a gable roof with a slope less than ½ on 12.

MBMA research project at UWO was completed to better understand how parapets affect wind loads on buildings. This lead to changes in ASCE 7-05.

2004

MBMA published its first Seismic Design Guide for Metal Buildings, authored by four seismic experts.

MBMA established an Energy Committee to focus in energy codes, cool roofs, and strategies to better insulate metal buildings.

MBMA participated in the RICOWI Wind Investigation Program, after hurricanes Charley and Ivan.

2005

OSHA and the Steel Coalition, of which MBMA was a coalition partner, agreed on a voluntary plan for the use of roll forming lubrication in lieu of a regulation on slip testing. In addition, MBMA inserted the requirements into the AISC-MB Certification program.

AISC published the first LRFD/ASD combined specification and MBMA began a comprehensive study of the specification to determine its impact upon metal building systems. In addition, MBMA began developing the specification requirements for inclusion into the AISC-MB Certification program.

MBMA initiated a new seismic research project at UC San Diego to learn more about the seismic behavior of metal buildings and to recommend appropriate seismic design standards.

By Bob Ammerman, Chairman,
Metal Building Manufacturers Association

Chairman's Column

MBMA - There's Just Nothing Like It

My first exposure to the MBMA was in the mid 70's as a general manager for the Varco-Pruden Building organization. Bob Kelley was the president of VP at the time and an avid supporter of the MBMA. Bob served as MBMA chairman on several occasions dedicating his leadership and the support of his company to the advancement of the association and our industry. As a result of his inspiration my MBMA commitment emerged.

I probably attended my first meeting about 1980 and was in awe of the industry leaders and their vision for growth. While fierce competitors by day, they shared a friendship and common commitment to the best interest of the industry. Observing these industry giants shaped the principles for my 30-year building systems career. As I moved from VP Buildings to Stran Buildings to the UDI Buildings Group to American Buildings and MAGNATRAX, I jointly carried the flag of the MBMA and the companies I served.

I have enjoyed multiple terms on the MBMA executive committee and been privileged to serve as chairman on two occasions (1995 and 2006). I believe the MBMA is the most productive association with which I've been involved. If it weren't for our research and engineering accomplishments, our work with building code officials and local code authorities, the building systems industry might not have ever emerged.

INDUSTRY-CHANGING EVENTS

Two of the most significant programs developed in the MBMA's 50-year history are the AISC-MB Certification and Associate Member programs. The certification program has moved the industry to an unprecedented level of quality and credibility, assuring building owners superb value. The Associate Member program has embraced suppliers of products and services to our industry. It has enhanced mutual understanding and resulted in a common commitment to industry growth and success. Today's Associate Members are involved side-by-side with manufacturing members in every aspect of MBMA activities.

Industry consolidation and leadership changes have introduced challenges to the MBMA during the last decade. The industry has emerged from primarily entrepreneurial, locally-owned businesses to include corporate conglomerates and international owners. While the brands remain relatively constant, the number of corporate entities has lessened with multiple branding becoming common place. The MBMA challenge is to retain the support and resource commitment of all companies, both large and small. Communication effectiveness is more important than ever before. Together we can accomplish far more than as individual companies.

I enjoy my career in the buildings industry. Our industry has helped millions of building owners realize their dreams. Personally, I am richer because of friendships built with MBMA colleagues, thousands of builders and the associates of the companies for whom I've been privileged to serve. I think you will see this as a common theme in the following interviews with some of MBMA's past chairmen. As you read their comments, please recognize the sacrificial contributions that each has made for the betterment of our industry.

LON SHEALY served as MBMA chairman in 1979 and served on the executive committee from 1975-1979. He began his career in the metal building industry in 1947. After retiring from the workforce in 1987, he wrote a book, Destiny by Design, on strategic planning. He was also appointed Assistant Director of Commerce by the governor of Oklahoma. Today, at age 82, he runs a program to build integrity and character in teens. (Learn more at theadventureoflife.com.) Here's what he says about his time in the industry:

On MBMA's Influence

When I was on MBMA's executive committee, we had a mission to do better by the construction industry, offering attractive and functional structures at lower costs. The net value is that our efforts saved the American economy billions and billions of dollars. Much of the retail and commercial construction could not have happened without systems construction.

As an association, those of us who led competing companies learned to work together. Just as when Butler shared their research on wind damage in Canada, we learned to trust and help one another. We became loyal to our industry. MBMA made this possible. They saw the potential of teaming together and lived up to it.

In my opinion, no association has done it better.

On Innovation

During this time, the industry also came to grips with the power and value of innovations. By systematizing and industrializing the construction process we married the concepts of automation, industrialized production, and installation. And by joining them together … acting out-of-the-box … we became part of building an industry.

In the process of building an industry, we built bonds between manufacturers and contractors. We realized we needed each other to spur innovation. Together, we learned not to fight other products that could be used with metal, but to accommodate masonry and other surfaces to provide a more versatile product.

When computers were new, we brought a child to our annual meeting and set him before a computer to let him show the builders how easy it was going to be to estimate building costs with technology. We were among the first to bring computers into the builders offices.

As early as the 1960s, we could see the beginnings of globalization and introduced our first metal building in Israel. People were astounded, calling it "the miracle building" because it went up so fast.

DON PRATT served as chairman of MBMA in 1983 and was on the association's executive committee for several years prior to his chairmanship. An industry leader throughout his career, he remains visionary about the industry and respectful of MBMA's contributions. Here are his thoughts:

On MBMA's Impact …

Thomas Associates and MBMA showed vision early on when they chose to bring design capability on staff. They were one of the first trade associations to think in terms of research and analysis and its potential impact on their industry. Research, for example, led to proper light gage steel design. We had the AISC manual for main frame design, but it didn't have informa-

tion for designing purlins and girts and other components that make up a building.

Also, MBMA doesn't take enough credit for their safety programs. The industry became a lot safer because of MBMA.

The continued refinement of statistical information is another MBMA attribute. Their statistics identify market opportunities and allow companies to address markets with better knowledge and insight based on solid data.

And, of course, the AISC-MB Certification program is one of their association's primary achievements. Certification has enabled the industry to greatly enhance its stature in an increasingly technical industry.

On the Future ...

The building systems industry grew into an industrial building market that led to new systems solutions. But today, this market is declining as manufacturing moves offshore and into foreign labor markets. The future lies in commercial and institutional markets. While requiring different structures and solutions, these markets offer enormous growth opportunities.

On MBMA's Place in History ...

Our industry has a unique history and MBMA is a unique organization. It has created a place where competitors can work in cooperation to solve industry issues. Such cooperation has allowed the technology to evolve and adapt to offer high performance solutions for commercial and industrial buildings.

MBMA encourages the exchange of ideas. This has led to a steady stream of new construction and system building technologies that have changed individual member companies and the industry as a whole.

GEORGE KING served on MBMA's executive committee from 1987 to 1990, and again from around 1992-1995. He also served as chairman twice – in 1990 and 1995. George felt his "call to duty" was rewarding because of the significant achievements of that era. Here are his thoughts:

On Certification ...

"I was on the executive committee when the board of directors adopted the AISI-MB Certification program. It is one of key accomplishments that MBMA has achieved in its 50 years. Certification raised the level of quality which allowed metal building systems to become more widely accepted by code authorities.

"I was one of the drivers of the program, along with several other board members. It brings up vivid memories of long hours and hard work, but the result was industry-changing."

On Industry Research ...

"Throughout its history, MBMA's solid commitment to research has had a major influence on the industry. This research has enabled the industry to broaden its horizons in terms of end use of metal systems. Metal became more than 'tin sheds' and 'shades and shelters.' Metal systems became widely used and attractive – because of the research effort. And, the research enabled the technical committee to work with model and city code authorities to gain wider acceptance of metal building systems in the marketplace.

"Research, development, and engineering … along with certification … changed our industry and led to tremendous growth. And it was all accomplished by a group of highly competitive companies who chose to unite and come together for a common cause. I've seen this happen to some extent in other associations, but none others have been as successful at this as the MBMA."

TERRELL LANDRUM served on MBMA's executive committee from 1994 to 1998 and was elected chairman in 1998. Today, "I'm living a full life and having a wonderful time," he said, "I highly recommend retirement if you can afford it!" His days revolve around fishing, tennis, travel and grandchildren. Here are his thoughts on MBMA and the metal building industry.

On Standards...

During my years on the executive committee, MBMA continued to enhance the AISI-MB Certification program. It is an outstanding program, in terms of creating value and quality for the entire industry. It sets stringent standards for the design and manufacturing of buildings for the betterment of the whole metal building industry.

On the Future...

I believe metal systems manufacturers will continue consolidation with only five or six very large firms in the next ten years, and several smaller regional firms surviving in their geography. It's good when small firms join to make one better firm, creating economics of scale. But when large firms merge for the sake of getting larger, employees will lose jobs, the company will lose talent, and indifference can grow. It's not a good thing if it won't benefit the people.

On MBMA's Value...

MBMA has brought value to our industry. Forty years ago, we were building "shade and shelter" structures. Establishing the MBMA brought us all together to become more sophisticated, to have higher ethics, and to promote our industry. Because of MBMA, we became a more respectable industry and we can stand together and be heard with one voice. This is very important as we work with the code bodies, major steel companies, and specifiers.

BOB LOWE was chairman of MBMA in 1999 and 2005. Throughout his career, he has spent 16 years on MBMA's board of directors and worked on many committees and special initiatives. "I have witnessed the evolution of the MBMA," he said, "from an exclusive 'Good ol' Boys' club to a flexible organization that responds proactively to inevitable change." Here are his comments:

On the Codes

The development of the 2000 International Building Code which incorporated the most conservative features of most of the previous regional building codes, put us at competitive disadvantage. More than anything else, the 2000 IBC, demonstrated how clearly MBMA needed to be focused on technical research and code lobbying, which has become a great strength of the association.

On MBMA's Place in the Industry

Since our technology and products are unique to our industry, the early days of the MBMA were earmarked by the united efforts to gain acceptance for our form of construction in the market place. After that initial success, the role of the association became to broaden our scope of acceptance and defend our gains. The MBMA is the only association that compiles the technical and marketing information necessary to grow the industry as a whole.

On the Future

All things cycle. I see the demand for MBMA products growing with the population and consumption per capita that drives non-residential construction. My ten year forecast is that the up and down cycles will be 25% higher than the last decade with a peak year at 2.5M tons. As markets improve, the past consolidations will reverse somewhat as newer, smaller regional companies again appear in prosperous niches.

On the Industry

Our industry focuses on meeting a real need of society. Our buildings safely and economically house all of the activities that make peoples' lives better. Places of work, distribution, worship and recreation all come from our plants. There is little doubt that our industry has improved the quality of life in this country…..and will continue to do so!

CHUCK STOCKINGER is the industry's most knowledgeable resource on MBMA history. He began working for Thomas Associates, Inc. (and on the MBMA account) in 1974. He has been general manager of the association since 1980. In his 32 years with MBMA, he has seen many things and has been involved in every corner of the industry. Here are some of his thoughts:

On MBMA's Achievements …

MBMA has had a tremendous impact on the expansion of the industry and made giant strides through model code work, structural research, fire testing, market development, AISC-MB certification, in-plant and on-site safety, and industry statistics – to name a few . Such a broad-based association has advanced the industry and led to the advancement of other related associations. We've dramatically improved the image of steel building systems and helped to improve their quality and reliability. We've helped to give the industry form and substance. Yet, all of these advancements would have been impossible without the tremendous and constant commitment, and financial support made available over the years by the senior management of the association's member companies. They have been—and are—the change agents that have made it possible for the industry to become the credible leader it is today.

On Leadership …

The original members had to pioneer virtually every single initiative and program. There was no model in terms of an industry association to learn from. One of the most important original projects was the development of the metal building systems design manual. This allowed us to identify common practices and clarify design parameters unique to metal building systems. It helped lead to the recognition and acceptance of metal building systems by specifiers and end users, and positively influenced the various building codes. This, of course, helped the industry to grow. The manual has been continuously improved and updated over the years, and has become accepted as the authoritative resource on metal building systems design by building code officials, specifiers, and end-users nationwide.

Another significant leadership action occurred in the late 1950s. Through the hard work of the members, we were able to have a positive effect on the insurance industry and helped them to recognize that metal building systems are a good risk, and typically perform quite well under extreme conditions. This effort was another milestone in the industry's ability to gain credibility and acceptance, and to grow.

AISC- MB Certification, which AISC and MBMA pioneered and implemented together, is also a leadership initiative that changed the industry. The program certifies manufacturers of metal building systems and identifies important performance characteristics typical in the design and fabrication of metal building systems. Finally, our early and continuously extensive work in collecting and compiling industry statistics has brought benchmarking and demographics to the industry. Few associations can boast such comprehensive statistical programs.

MBMA's Associate Program Builds Crucial Intra-Industry Relations

MBMA's Associates Member program was instituted in 1995 and has resulted in a far more robust organization. Originally, the association only served metal building system manufacturing firms. The addition of the Associates program allowed participation by companies who supply critical products and services for building systems manufacturers.

"The addition of the Associates program changed MBMA from an association for manufacturers to an association involving all industry stakeholders," said Randy Ridenour, vice president of Atlas Bolt & Screw Co.

Ridenour cites three ways in which participation in MBMA has benefited his firm:

• It has allowed them to understand the industry and have a better handle on where it is headed, through the statistics MBMA provides.

• It has introduced his company to industry leaders whose manufacturing firms are current or potential customers.

• Involvement in committee work has led to new contacts, opportunities to uncover product development potential and to address specific industry needs.

Ray Bauer, vice president for sales and marketing and CMC Steel concurs. By getting involved in MBMA through the Associates program, his firm gained knowledge of the industry and that helped them decide to produce high-strength flat bars that metal building system manufacturers need to make support beams. "We made a commitment to make a product they could use," says Bauer, "and this allowed us to double and quadruple our sales to the industry over the past ten years."

Bauer says that participation in the association helps his team understand "what makes MBMA tick" and makes them want to invest more in the industry. "Knowledge of the industry, obtained through involvement in MBMA, has led to good, solid, synergistic relationships with building manufacturers," he added.

Al Dunlop is general manager of Valspar Corporation, the sixth largest coil and extrusion coatings company in the world. He underscores the value that the Associates program has brought to his firm. "MBMA is proactive and involved in code work and specifications that make the metal building systems industry more credible," he says. "We feel like we are partners with the manufacturers and that we're all working together for the benefit of us all."

All three men give special credit to Bob Ammerman, who served as chairman when the Associates program was instituted. "Bob has great passion for the industry beyond anyone I know," said Ridenour. "He has a great ability to set aside the interests of his own firm and get people motivated for the good of the industry."

ASSOCIATE MEMBERS

Metal Building Manufacturers Association

Akzo Nobel Coatings Inc.
ATAS International Inc.
Atlas Bolt & Screw Co.
BASF Corportation
Building Research Systems Inc.
CertainTeed Corporation
CMC Steel
CMC Steel Group
Consolidated Metal Products
Custom Solution Roof & Metal Products
DOFASCO
Dominion Building Products
Dow Chemical
Expi-Door Systems Inc.
Feralloy Corporation
Gerdau Ameristeel Corporation
Guardian Building Products Inc.
ITW Buildex
Metal Building Software Inc.
Metallic Products Corporation
New Process Steel L.P.
Nucor
Owens Corning
Palram Americas Inc.
Questware Corporation
Roof Curb Systems LLC
Schnee-Morehead Inc.
SFS Intec Inc.
Sika Corporation
Socar Inc.
Southeastern Bolt & Screw Inc.
Steel Dynamics Inc.
Steels Cape Inc.
Tremco Inc.
United States Steel Corporation
Valspar Corporation