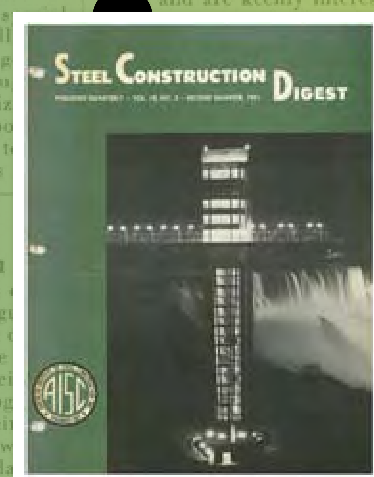
50 Years of Steel

A look back at the first half century of *Modern Steel Construction* magazine.



FOR THE PAST 50 YEARS, *Modern Steel Construction* has chronicled the growth of the fabricated structural steel industry. Whether it was the first North American use of high-strength steel or the industry shift to A992, *MSC* illustrated the trends in steel design and construction through thousands of pages of project profiles, technical reports, and new product information.

The magazine's roots actually go back to 1930, when AISC launched *Aminsteel News* to keep members informed about the fledgling association's work. By 1938, it had morphed into *The Steel Constructor*, which included association news and technical updates. By 1944, it was supplanted by *Steel Construction Digest*, a newsletter with a reach extending for the first time beyond the association's membership.

Finally, in 1961, *Modern Steel Construction* was born.

For half a century, *Modern Steel Construction* has presented the latest information on both buildings and bridges. We covered the nation's first welded suspension bridge in 1964 and just last year we wrote about innovative folded plate girder systems. In the 1960s, we wrote about structural innovations such as composite construction and today we're covering such topics as self-centering frames and slit steel-plate shear walls. We wrote about the beginning use of spray-applied fire protection in 1970 and we're now covering shop-applied intumescent paints.

The following pages present a pictorial of 50 years of *MSC*. But if you want more, please visit **www.modernsteel.com**. We've posted every issue for your reading enjoyment (just click on the archives link in the upper right hand corner).

1994: Moment connections provided both long spans and structural stability on the Bullocks department store building in Burbank, Calif.

1994: *MSC* notes that only four states require continuing education for renewal of P.E. licenses.

1994: *MSC* extensively covered the Northridge earthquake and the resultant seismic research.

1996: H. Louis Gurthet begins a 10-year tenure as president of AISC (yes, the same Lou Gurthet who now handles *MSC* ad sales!).

1994: For the first time, *MSC* printed the complete list of AISC Certified fabricators.

1995: Finally answering the question of why we put a Christmas tree atop a building during the topping out ceremony.

1996: Five years before 9-11, owners and designers were already concerned with the potential for terrorism. New York City's new 911 service center is designed to resist a terrorist attack.

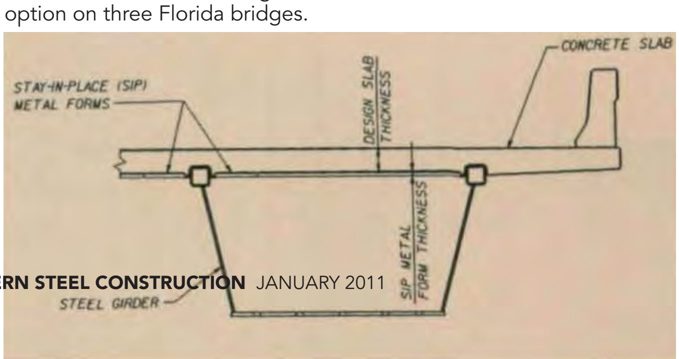
1994 — 1995 — 1996

1994: Larry Griffis' T.R. Higgins lecture offered everything you need to know about composite frame construction, using the Bank of China in Hong Kong as one example.

1996: The Reduced Beam Section (dogbone) is introduced.

1996: AISC introduces its first website.

1995: Post tensioned box girders were an aesthetic and cost-effective option on three Florida bridges.



1996: Seismic design is in the forefront of everyone's mind. This issue featured new information on weld toughness and introduced *MSC* readers to the first of a series of proprietary seismic solutions: the MNH-SMRF Connection, now known as the SidePlate® connection.

1997: The Niles West Field House in Skokie, Ill., minimized its internal volume (and therefore the space that needed to be heated and cooled) by moving the structural system outside the building.

1997: The Blue Water Bridge between Port Huron, Mich., and Sarnia, Ontario, is an early example of the use of LRFD in bridges (it was also designed with all SI units).

1997: A lecture at the 1997 NSCC explained the concept of unrestrained and restrained fire ratings. As the speaker noted, almost all interior steel can be considered restrained in fire calculations.

1997: Combining Grades 70W, 50 and 36 on the Central Bridge between Newport, Ky., and Cincinnati allowed the designers to maintain a constant girder depth.

1997 | 1998 | 1999

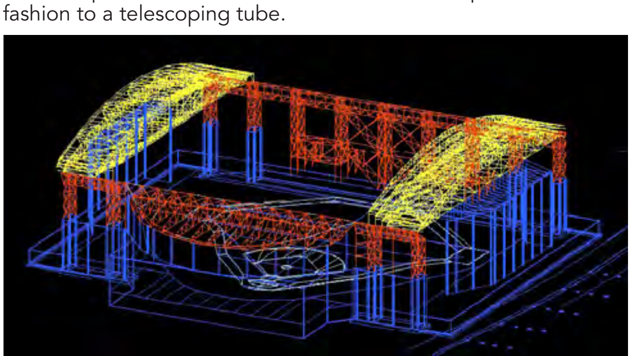
1998: The Guggenheim Museum in Bilbao, Spain, ushers in the Age of Gehry.

1998: AISC introduces its Erector Certification program.

1998: *MSC* publishes an in-depth analysis of the cost-saving potential of A572 Grade 50 compared with A36.

1998: The Cardington fire tests encourage designers to contemplate performance-based fire design as a practical alternative to prescriptive designs.

1998: Moveable roofs are all the rage for ballbarks. For the Bank One Ballpark in Phoenix, the two halves collapse in a similar fashion to a telescoping tube.



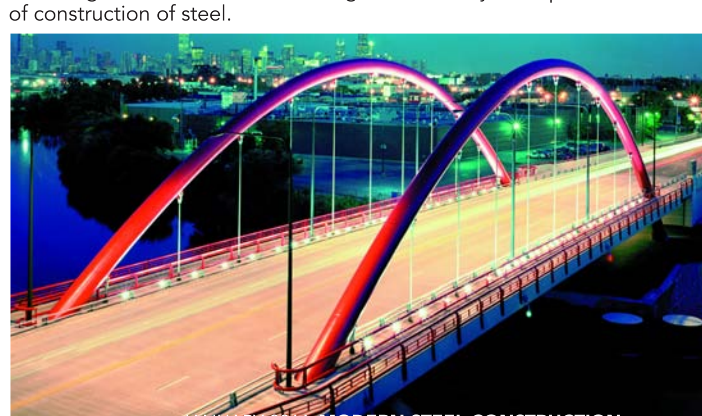
1999: The Steel Conference heads north to Toronto and is renamed the North American Steel Construction Conference.

1999: AISC pushes EDI to the forefront of steel design.

1999: It only took 26 months from the start of design to the completion of construction on the 1.5-million-sq.-ft Boeing Rocket Booster facility in Decatur, Ga.

1999: A992 is introduced.

1999: Damen Ave. arch creates a new neighborhood landmark in Chicago while also demonstrating the economy and speed of construction of steel.



2000: The steel-plate shear wall installed during the rehabilitation of the Oregon State Library in Salem was a precurser to a system that gained popularity later in the decade.

2000: A new system using concrete plank atop a grid of asymmetric steel members is used on a new Drexel University dormitory building. The result is low-floor-to-floor heights and incredibly rapid construction. The system ultimately leads to the development of the increasingly popular Girder-Slab® System.

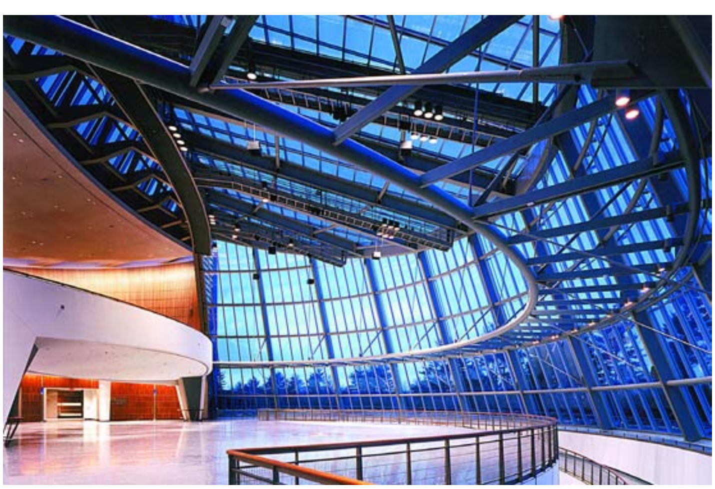
2001: Utilitarian doesn't have to mean pedestrian, as this chiller plant in Philadelphia proves.

2000: Nucor-Yamato Steel adds a surcharge to A36; the move to A992 is complete.

2000

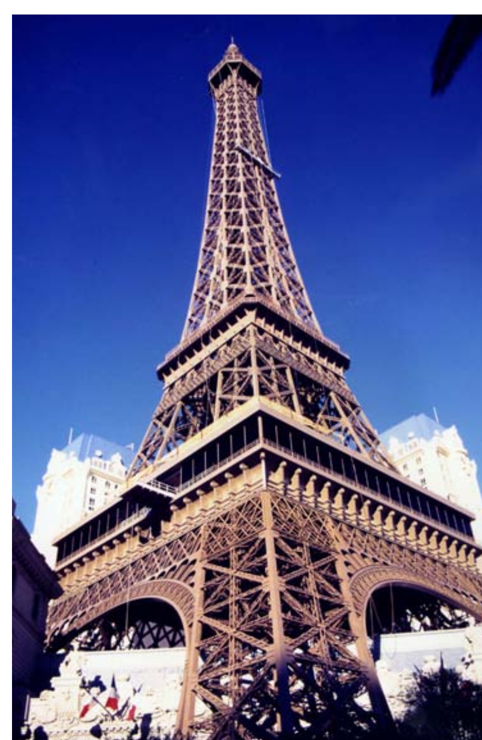
2001

2000: Design-Build is the buzzword for the year.



2000: Fire engineering saved $750,000 by reducing the need for passive fire protection of the exposed steel at the Mashantucket Pequot Museum in Ledyard, Conn.

2001: A new Eiffel Tower rises in—where else?—Las Vegas.



2002: Who says steel can't be fun? Few visitors to Seuss Landing in Orlando are aware of the complex geometry for the steel frame supporting everyone's favorite cat in a hat.

2001: AISC's parking structure and multi-story residential initiatives are in full-swing.

2002

2001: AISC opens the Steel Solutions Center.

2002: Everyone, including Case Western Reserve University in Cleveland, wants their own Frank Gehry building.

2002: After a pair of errant barges knocked down the I-40 bridge at Weber Falls in Oklahoma, the steel industry mobilized to get a new bridge up and open in just two months.

2003: For the Dallas Children's Medical Center, steel was the answer for adding six stories to the existing concrete structure.

2004: Houston's Reliant Stadium sets a U.S. record for the size of an opening in a moveable roof stadium.

2003: Steel framing dominates the early ranks of LEED-certified buildings, including one of the first Gold projects, the Department of Education Building in Sacramento.

2003

2004: An entire issue devoted to green construction includes a discussion of the designing for deconstruction as well as a look at a 454,000-sq.-ft green roof atop a Ford Motor Co. plant in Dearborn, Mich.

2003: The Gaylord Texan featured cellular steel beams—and will play host to NASCC: The Steel Conference in 2012.

2003: *MSC* publishes an AESS *Specification*.

2005: The parking structure for the Legacy Salmon Creek Hospital in Vancouver, Wash., is an early example of the SmartBeam™ system in a parking structure.

2005: Building 1 at Santa Row in San Jose, Calif., was one of the first to use the proprietary ConXtech system.

2004

2005

2004: The US20 brige over the Iowa River is the first in the U.S. to use the incremental launch method for erecting an I-girder bridge.

2005: Buckling Restrained Braced Frames (BRBF) became very popular later in the decade. Shown is an early example at the Intermountain Medical Center in Murray, Utah.

2004: Santiago Calatrava's Sun Dial Bridge in Redding, Calif., works as both a sculpture and as a bridge.

2005: Roger E. Ferch becomes AISC's new president.

2006: A diagrid steel frame gained attention for the 46-story Hearst Building in New York City.

2007: The Main Street Bridge in Columbus, Ohio, is the first inclined single-rib arch bridge in the U.S.

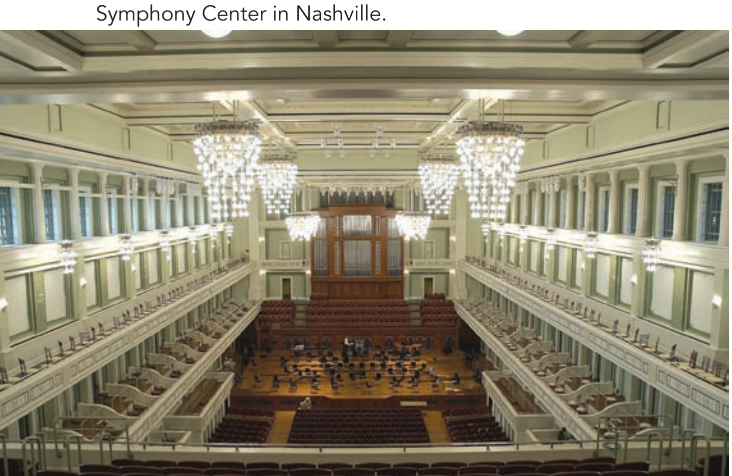
2006: The roof of the old center was salvaged and reused when the Richmond (Va.) Convention Center was expanded.

2007: The Gateway Bridges on I-94 near Detroit mark the first time tied arches are built with longitudinal ties buried under the road. The innovative system solves the redundancy issue with tied arches.

2006

2007

2006: Acoustic isolation was a critical success on the Schermerhorn Symphony Center in Nashville.



2007: Cellular beams help Boise's Banner Bank achieve green goals while also providing long open spaces and low construction costs.

2008: The Bank of America Tower in New York City features 15-ft cantilevers to create column-free executive offices.

2008: Southpark Hospital in Shreveport, La., remained fully operational while an additional floor was added.

2008

2007: The Blennerhassett Bridge over the Ohio River between West Virginia and Ohio used 30 million lbs. of HPS for its 4,000-ft span.

2008: A steel framed, post-tensioned slab system proved economical for a parking structure at Ruby Memorial Hospital in Morgantown, W.Va.

2008: The Dallas Cowboys Stadium boasts the largest single-span roof structure in the world.

2009: Shop-applied intumescent fire protection cuts the construction schedule on the the BJC Institute of Health in St. Louis.

2010: A look at thermal bridging in steel structures.

2009

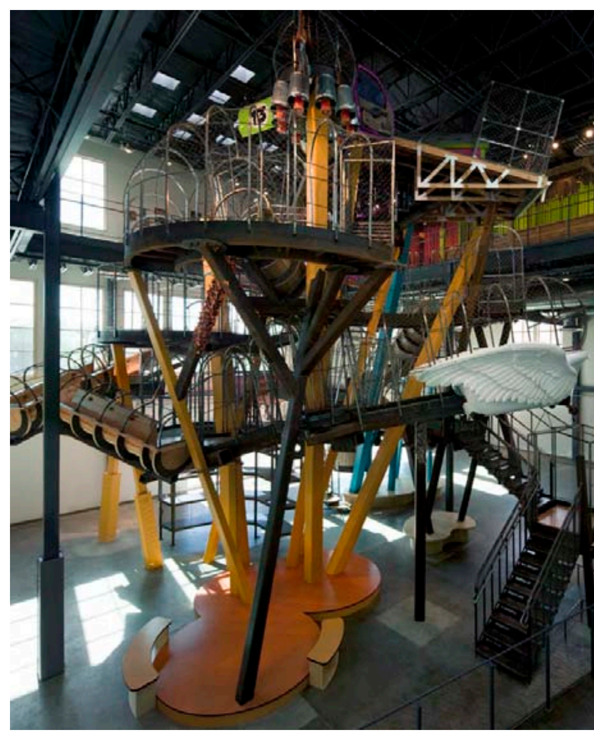
v's Federa
rope's tal

Rising

BY BRAD MALMSTEN, P.E.

2009: Exposing the New York Times Building's structural system on the exterior of the building is part of a design to exemplify the ideal of transparency in journalism.

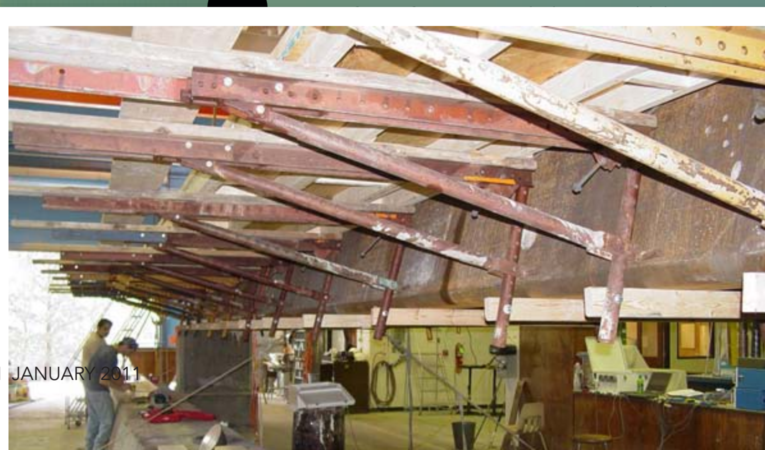
WHILE THE NEVER-ENDING RACE for world's tallest building has shifted to the Middle East for now, tallest on the continent is nothing



2010: The climbing structure at the Children's Museum in Phoenix required more than 400 bolted connections.

walls—facilitating the MEP design and the layout of refuge floors.

The complex geometry of the tower also made these particular areas more conducive to steel framing. The extraordinary amount



2009: Folded plate girder bridge systems have the potential to revolutionize the short-span bridge market.

Til

BY ROBERT B. ANDERSON, P.E.,
MIKE GUTER, P.E., AND

2010

2010: Curved steel played a critical role in the design of the Kauffman Center for the Performing Arts in Kansas City, Mo.

2010: Panelized construction sped completion of a residence hall for Southern Nazerene University in Bethany, Okla. MSC

DETROIT'S NEW MEXICANTOWN Bagely Street P... Bridge is the first cable-stayed bridge in the state and part of Michigan's $230 million I-75 Gateway Project. The two-span, cable stayed structure crosses 10 ramps and roadways, including both I-75 and I-96, and provides a vital link between the east and west sides of Detroit's Mexicantown community.

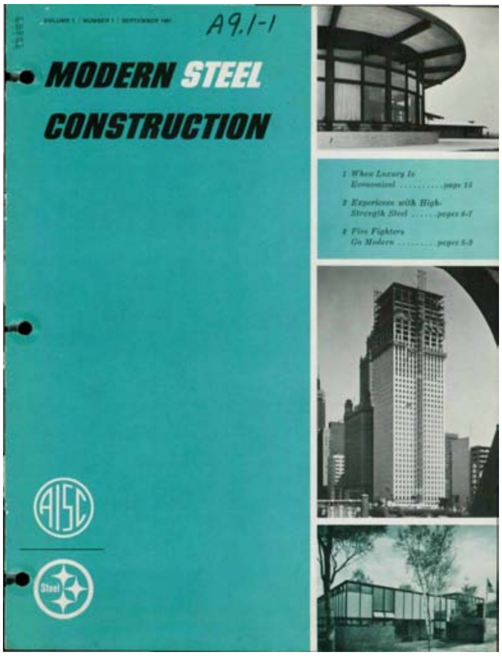
The total bridge length is 417 ft, with a main span of 276 ft and a back span of 141 ft. The forestays are arranged in a fan configuration and are inclined in both the longitudinal and transverse directions. The bridge features a unique asymmetrical design, with a selected look of a single cable plane. A single 155-ft-tall inclined pylon provides the upper support for the cables, which form an eccentric plane and are anchored at the lower end to a tapered, trapezoidal, single-cell steel box girder.

The back span balances the forces imposed by the forestays and anchors into a deadman/abutment. The welded steel, trapezoidal box girder carries the variable-width deck slab. The project incorporates

structure. Each portion of the project, including abutments, entry plazas, barriers, and fencing employs architectural finishes with three-dimensional variations, and is therefore highly stylized aesthetically.

The bridge lies on a tangent horizontal alignment. The western span expands from 15 ft, 3 in. to 21 ft, 6 in. while the shorter eastern span widens even more dramatically, from 21 ft, 6 in. to 34 ft. The pedestrian walkway entrance and exit grades of the vertical profile are at 5% grades and are connected by a 200-ft crest vertical curve whose midpoint is located near the pylon. The minimum vertical clearance to the closest underlying roadway is 16 ft, 10⅜ in. at the eastern abutment.

The structural system—a single-cell box girder superstructure—is supported at the westerly forespan by stay cables anchored eccentrically to the girder shear center at the northern girder web. The eastern back span is self-supporting and also transmits compression forces introduced by the westerly forestays to the east abutment.



1961: *Modern Steel Construction* debuts as 16-page periodical, William C. Brooks serves as first editor.

1961: A36 introduced

1961: High-strength steel makes its North American debut on the One East Wacker Dr. building in Chicago; coincidentally, AISC moved its headquarters to this building in 1989.

FIRST STEEL FOR ST. LOUIS ARCH

In mid-February the first 40-ton triangular section of the Jefferson National Memorial was set in place by Pittsburgh-Des Moines Steel Company. The Saarinen-designed arch will soar 630 ft above the park on the St. Louis waterfront and will contain 4000 tons of steel. The all field-welded structure will be completed in 1964 for the Bicentennial celebration.

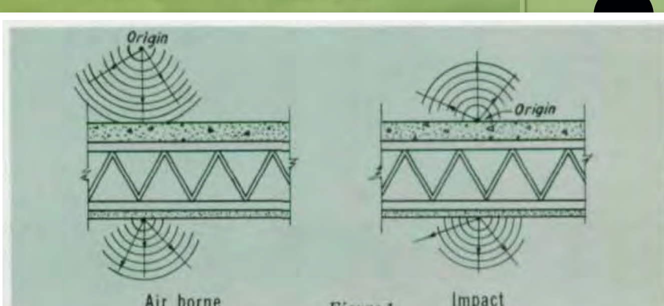
1961

1962

1963

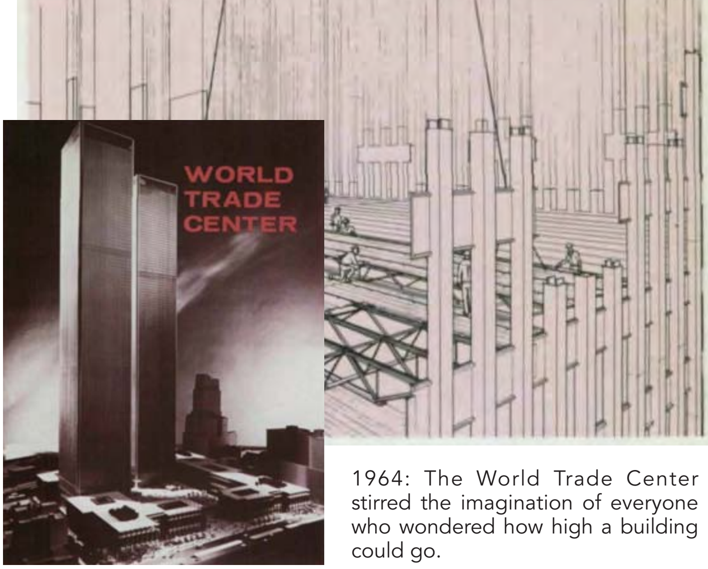
1962: Steel designers are introduced to a new shape when steel tubes make their first appearance in *MSC* in an article entitled "New Member Joins Structural Family."

1963: Leslie N. Gillette begins serving intermittently as acting editor of *Modern Steel Construction*.



1963: In a discussion that persists today, *MSC* asks "How quiet are steel floors" and discusses methods of mitigating sound transmittal in steel-framed buildings.

1963: Parking structures were a growing market and AISC showcased several projects using high-strength steel to minimize columns and reduce costs.



1964: The World Trade Center stirred the imagination of everyone who wondered how high a building could go.

1965: Steel's advantage in office building design is evident in the Continental Center project, which featured 42-ft square bay spacing—a previously unheard of figure in Chicago.

1963: *MSC* looks at the future and discusses the possibility of using "electric computers" for steel detailing.

1964: The future is now. *MSC* discusses the potential use of digital computers for engineering calculations.

1964: AISC unveils a new technical publication, *Engineering Journal*.

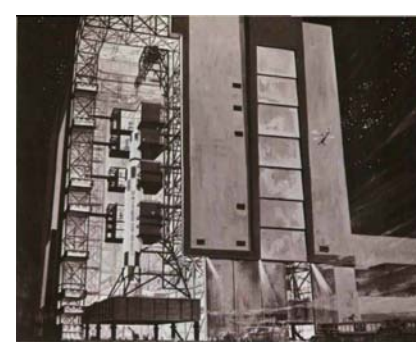
1965: Leslie N. Gillette returns as acting editor of *MSC*.

1964

1965

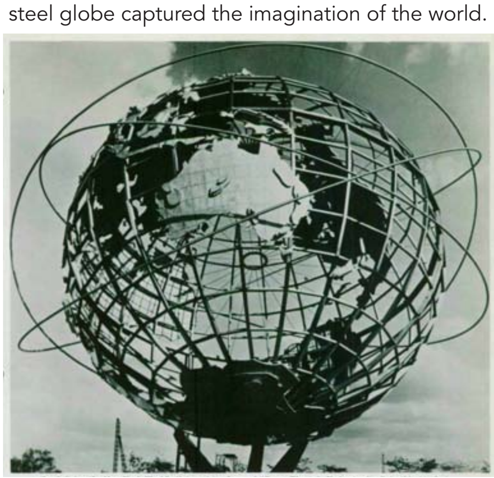
1964: The Vincent Thomas Bridge in Los Angeles Harbor made the pages of *MSC* as the nation's first welded suspension bridge.

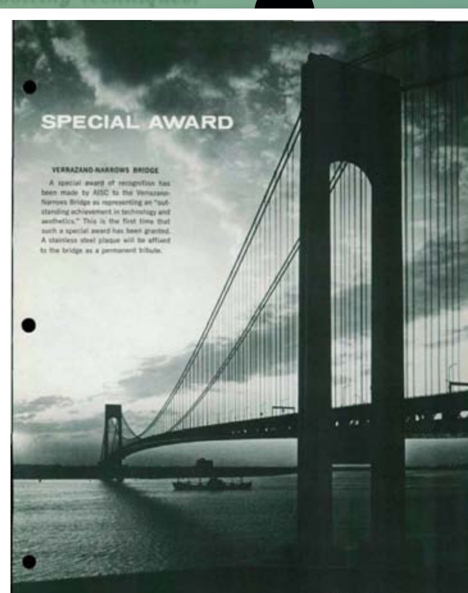
1964: A.M. Hattal named editor of *MSC*.



1965: With 125,000,000 cubic feet of enclosed space, the Vertical Assembly Building (used to build the 362-ft high Saturn rocket) at the Kennedy Space Center is touted as the world's largest building.

1964: The New York World's Fair and its iconic steel globe captured the imagination of the world.





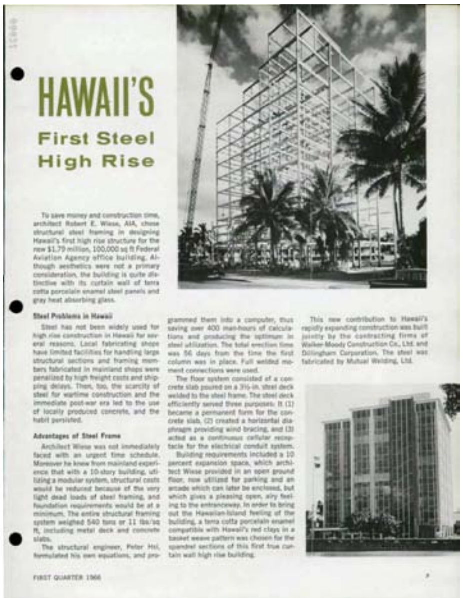
SPECIAL AWARD

VERRAZANO-NARROWS BRIDGE

A special award of recognition has been made by AISC to the Verrazano-Narrows Bridge as representing an "outstanding achievement in technology and aesthetics." This is the first time that such a special award has been granted. A stainless steel plaque will be affixed to the bridge as a permanent tribute.

1965: The Verrazano-Narrows Bridge receives a special award from AISC for its "outstanding achievement in technology and aesthetics."

1965: Zinc rich coatings gain popularity as the coating is used on a rehab of the Golden Gate Bridge.



HAWAII'S

First Steel High Rise

To save money and construction time, architect Robert E. Wiese, AIA, chose structural steel framing in designing Hawaii's first high rise structure for the new $1.79 million, 100,000 sq ft Federal Aviation Agency office building. Although aesthetics were not a primary consideration, the building is quite distinctive with its curtain wall of terra cotta porcelain enamel steel panels and gray heat absorbing glass.

Steel Problems in Hawaii

Steel has not been widely used for high rise construction in Hawaii for several reasons. Local fabricating shops have limited facilities for handling large structural sections and framing members fabricated in mainland shops were penalized by high freight costs and shipping delays. Then, too, the scarcity of steel for wartime construction and the immediate post-war era led to the use of locally produced concrete, and the habit persisted.

Advantages of Steel Frame

Architect Wiese was not immediately faced with an urgent time schedule. Moreover he knew from mainland experience that with a 10-story building, utilizing a modular system, structural costs would be reduced because of the very light dead loads of steel framing, and foundation requirements would be at a minimum. The entire structural framing system weighed 540 tons or 11 lbs/sq ft, including metal deck and concrete slabs.

The structural engineer, Peter Hsi, formulated his own equations, and programmed them into a computer, thus saving over 400 man-hours of calculations and producing the optimum in steel utilization. The total erection time was 56 days from the time the first column was in place. Full welded moment connections were used.

The floor system consisted of a concrete slab poured on a 3½-in. steel deck welded to the steel frame. The steel deck efficiently served three purposes: It (1) became a permanent form for the concrete slab, (2) created a horizontal diaphragm providing wind bracing, and (3) acted as a continuous cellular receptacle for the electrical conduit system.

Building requirements included a 10 percent expansion space, which architect Wiese provided in an open ground floor, now utilized for parking and an arcade which can later be enclosed, but which gives a pleasing open, airy feeling to the entranceway. In order to bring out the Hawaiian-Island feeling of the building, a terra cotta porcelain enamel compatible with Hawaii's red clays in a basket weave pattern was chosen for the spandrel sections of this first true curtain wall high rise building.

This new contribution to Hawaii's rapidly expanding construction was built jointly by the contracting firms of Walker-Moody Construction Co., Ltd. and Dillingham Corporation. The steel was fabricated by Mutual Welding, Ltd.

FIRST QUARTER 1966

1966: Despite high freight costs, steel proved to be most economical material for the 10-story Federal Aviation Agency office building, the first steel high-rise in Hawaii.

1966: Daniel Farb named editor of *MSC*.

1969: 888 7th Ave. in New York is an early use of composite construction.

1968: A572 is introduced.

1970: Dan Farb named AISC Director of Publications; Mary Anne Donohue named Editor of *MSC*.

1970: *MSC* touts the use of weathering steel for short-span steel bridges.

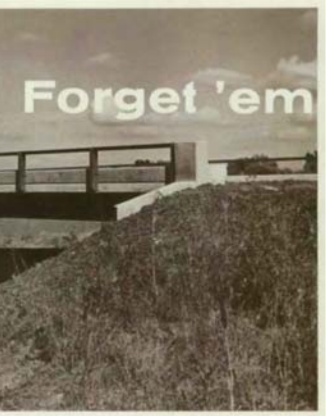
1970: AISC/AISI announce the development of a computer program for column design.

1966 1967 1968 1969

1967: Setting what might be a record for a building of its size, a 2.6-million-sq.-ft Chrysler plant was designed and constructed in just 11 months.

1968: The United States Pavilion at EXPO '67, received an AISC Special Achievement Award for "an outstanding achievement in technology and aesthetics."

1968: In an effort to capture more of the multistory residential market, the steel industry introduces an open-web steel joist system with gypsum plank for apartment construction.



1971: Both the John Hancock Building in Chicago and the U.S. Steel Building in Pittsburgh are among the structures honored in AISC's Architectural Awards of Excellence.

1972: St. Louis' Eads Bridge is designated a national historic landmark.

1971: Spray-applied fire protection is introduced after its efficacy is demonstrated in a 1970 UL test.

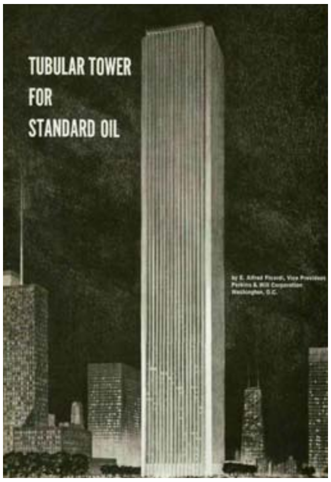
1970: AISC announces a new award: The T.R. Higgins Lectureship Award. The first winner is Egor Popov in 1972 for his lecture on "Connections Cyclic Reversal."

1970

1971

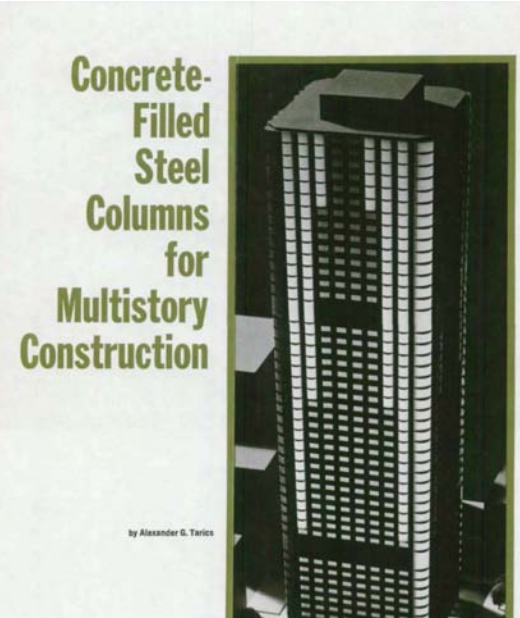
1972

1970: The designers of the Bell Telegraph Building in Pittsburgh use 100 ksi steel for its X-bracing.


TUBULAR TOWER FOR STANDARD OIL

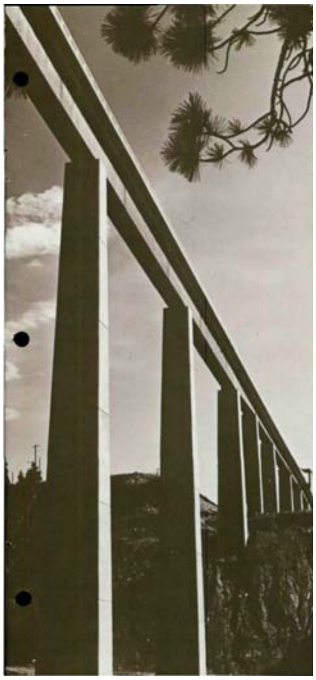
1970: The Standard Oil Building (now Aon Center) rises in Chicago; it features the first steel shell tube and at 1,136 ft. it was the fourth tallest building in the world when completed in 1973.

1971: Load Factor Design is introduced for steel bridges.


Concrete-Filled Steel Columns for Multistory Construction

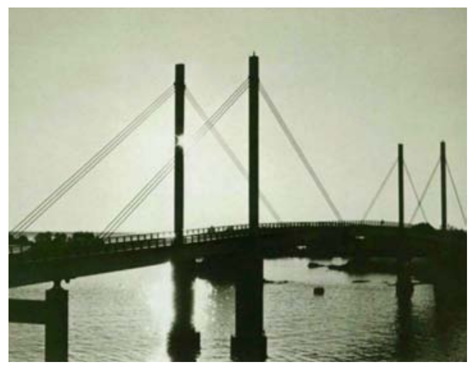
by Alexander G. Tarics

1972: *MSC* introduces its readers to the concept of concrete-filled steel tubes for high-rise buildings.



1973: The Latah Creek Canyon Bridge in Spokane is an early example of a steel box girder bridge.

1973: The first coverage of AISI's Scranton fire tests, which demonstrate that fire protection is not needed in open-air steel parking structures.



1974: The Sitka Harbor Bridge in Alaska is the first cable stayed vehicular bridge in the U.S.

1975: The Sears Tower wins an Architectural Award of Excellence.

1973

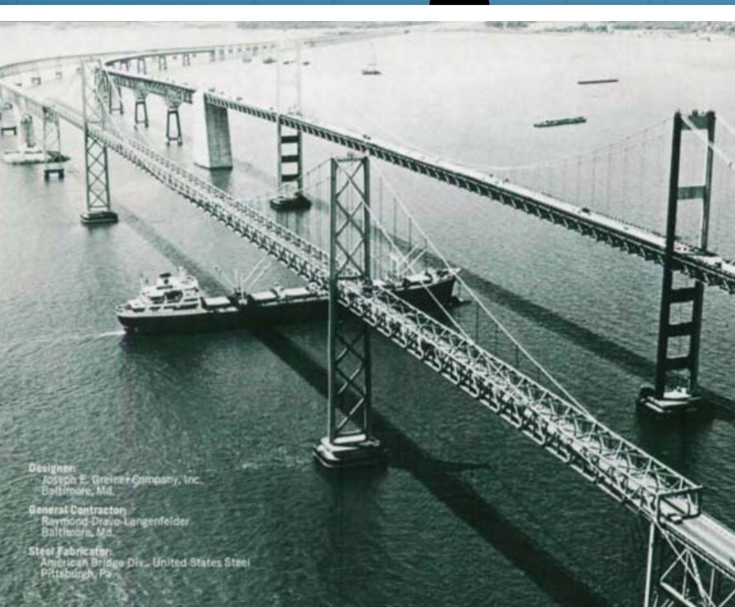
1974

1975

1973: Fazlur Khan is presented with the J. Lloyd Kimbrough medal, AISC's highest honor.

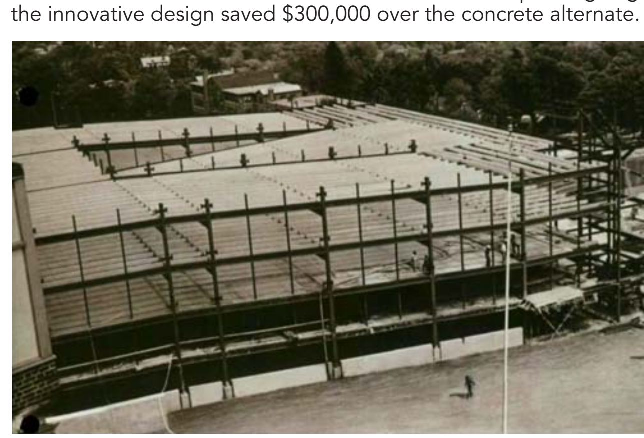
1974: Mary Anne Stockwell takes over as editor of *MSC*.

1974: The 12-story Ramada Inn in Los Angeles is one of the first buildings to feature a Skipcon System (a type of staggered truss).

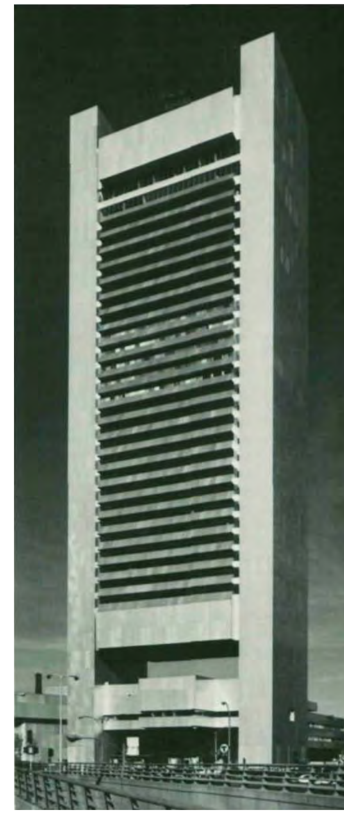


1973: The Chesapeake Bay Bridge combines four steel systems to create an incredibly economical bridge: continuous welded girder spans, suspension bridge, deck cantilever truss spans, and through cantilever truss spans.

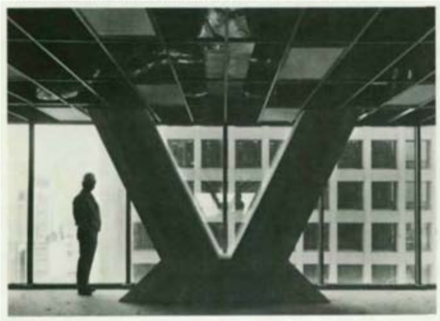
1974: The 590-space Faulkner Hospital Garage in Jamaica Plain, Mass., is billed as the nation's first steel-concrete composite garage; the innovative design saved $300,000 over the concrete alternate.



1976: The Louisiana Superdome is the world's largest fixed domed structure and its steel frame covers a 13-acre expanse.



1978: The Federal Reserve Bank of Boston utilized an X-braced "supertruss" design.



1976: The 56-story First International office building in Dallas features a trussed tube design with diagonal X-bracing and stub girders.

1976 | 1977 | 1978 | 1979

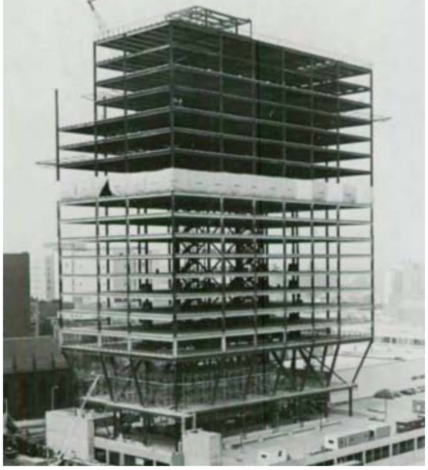
1977: The landmark Los Angeles Bonaventure Hotel features a cluster of five towers, all tied together to meet seismic design requirements.

1978: AISC introduces the AISC Quality Certification Program.

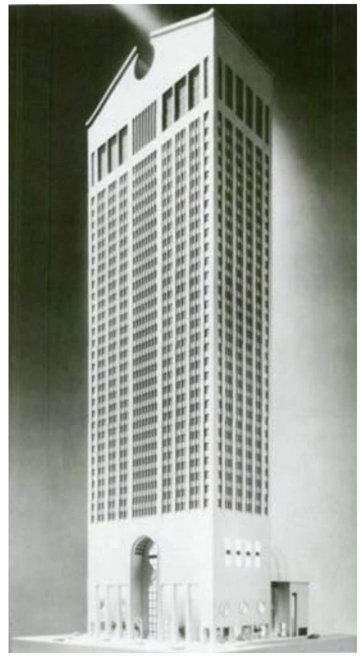
1975: The Russian Residence in New York City utilizes a slip form concrete core and a unique top-down construction technique.

1975: *MSC* discusses the impact of E119 on steel construction and the provisions for credit of the use of sprinklers.

1979: Demonstrating that no one is perfect, the New River Gorge Bridge in Fayetteville, W.Va., only receives a merit award in the AISC Prize Bridge Award competition.

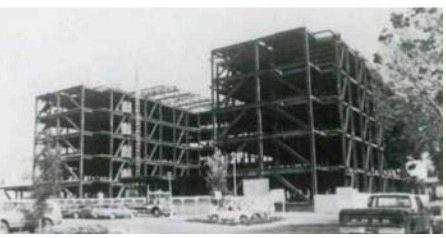


1981: One Corporate Center in Hartford, Conn., demonstrates the growing trend toward vertical expansions as it rises 16 stories on top of an existing building.



1982: *MSC* features Philip Johnson's controversial design for the AT&T Headquarters Building (now the Sony Building) in New York City.

1983: Michigan bans weathering steel prompting a multi-state study and new details that vastly improve the performance of this material that results in its renewed use.



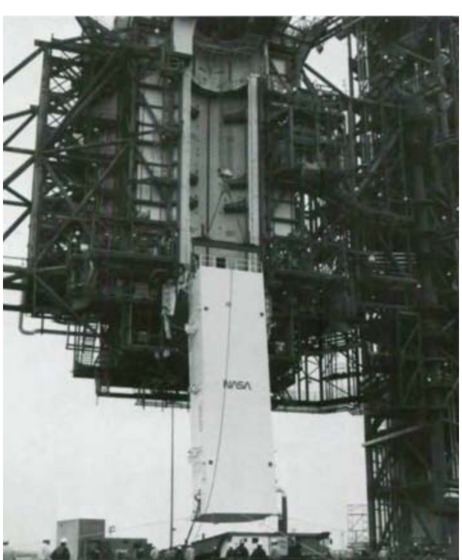
1980: The O'Connor Hospital in San Jose, Calif., is an early use of eccentric braced frames for seismic design.

1983: The Barnes Building Rehabilitation team touts their extensive use of computer analysis using STAAD-III.

1980 | 1981 | 1982 | 1983

1980: George E. Harper begins his tenure as editor of *MSC*.

1982: The first ads appear in *MSC*: Nicholas J. Bouras (now owned by Commercial Metals Company), TRW Nelson, W.A. Whitney, Cooper & Turner (now TurnaSure), and St. Louis Screw & Bolt.



1981: The Kennedy Space Center ignites the dreams of every child.

1982: Continuing its tradition of publishing practical information, *MSC* features an article on "How to Fasten Steel Deck."

How to Fasten Steel Deck

by Richard B. Heagler

1983: Four Allen Center in Houston is designed as a circue-ovular building to reduce wind loads.

1983: First AISC/AIA Student Design Competition.

1985: Fast track construction is all the rage; the 172,000-sq-ft Federal Express storage facility in Memphis goes from ground breaking to occupancy in just nine months.

1987: The AISC Steel Sculpture is created by Duane Ellifritt at the University of Florida.

1987: *MSC* increases its frequency from 4x to 6x a year.

1987: Since 1980, bidding alternate designs has gained in popularity and has allowed steel to be more competitive, resulting in such structures as the I-20/I-459 Interchange in Jefferson County, Ala.

1984: Maria von Trapp (yes, from the Sound of Music) looks over the steel framing for the new von Trapp Family Lodge in Stowe, Vt.

1984 1985 1986 1987

1985: For the first time, estimates put computer use in structural engineering firms at greater than 50%.

1986: The AISC Shapes Database is created for use on PCs.

1986: LRFD debuts and quickly becomes an obsession with *MSC* editors.

1987: The United Airlines terminal in Chicago helped popularize both the use of curved steel tubes and exposed structural steel.

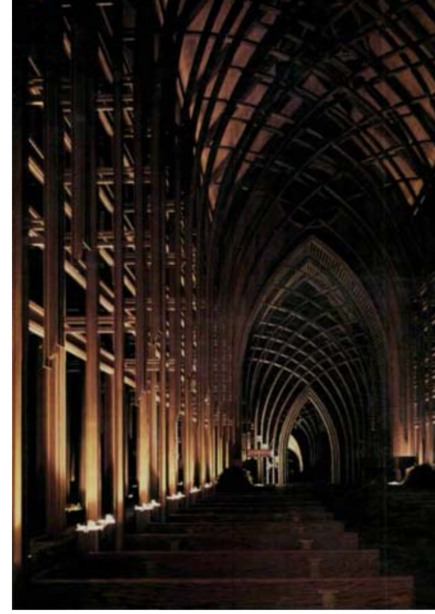
1986: The staggered truss system makes a comeback and is used on the 40-story Resorts International hotel in Atlantic City.

1983: National Bureau of Standards and AISI conduct tests that confirm the accuracy of FASBUS II fire computer modeling.

1987: The Quaker Tower in Chicago uses its central core as its complete lateral load resisting system.

1986: *MSC* introduces a new cover design—and color photographs!

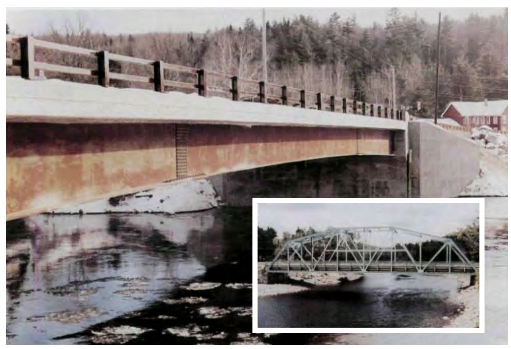
1988: A tube of wide flange sections creates an "infinity room" and a new tourist attraction at the House on the Rock in Spring Green, Wis.



1990: Cooper Chapel in Bella Vista, Ark., is arguably the most beautiful use of exposed structural steel ever.

1989: National Engineering Conference and the Conference of Operating Personnel join to become the National Steel Construction Conference (which would evolve into today's NASCC: The Steel Conference).

1990: The East Outlet Bridge in Maine is one of the first bridges designed and built to the new ALFD AASHTO specification.



1990: Scott Melnick named editor of *MSC*.

1991: Nucor-Yamato Steel introduces the first domestically produced 40 in. beam.

1988

1989

1990

1989: LRFD is just starting to show up on projects. The designers of the AEGIS pre-commissioning building in Bath, Me., report that using LRFD reduced the weight of the structure by around 10% and that the learning curve to switch from ASD to LRFD was "not severe."

1989: Snug-tight bolt provisions are promulgated.

1990: Setbacks required by the New York City zoning code required the use of 84 transfer girders on the 35-story 750 Seventh Ave. building.

1989: AISC issues 9th edition ASD Manual; sells 60,000 copies in one year.

1990: Pilot Field in Buffalo ushers in a new era of stadium design featuring exposed structural steel. The design proves popular and is a forerunner to most of the major league ballparks built since then, including Camden Yards in Baltimore, the Cleveland Indians Stadium, PNC Park in Pittsburgh, Coors Field in Denver, and the Rangers Ballpark in Arlington.

1990: The bridge on State Route 739 over US33 in Union County, Ohio, was an early adopter of integral abutments.

1991: The Morton International Building in Chicago was built over active railroad tracks. As a result, the entire structure is suspended from huge exterior overhead trusses.

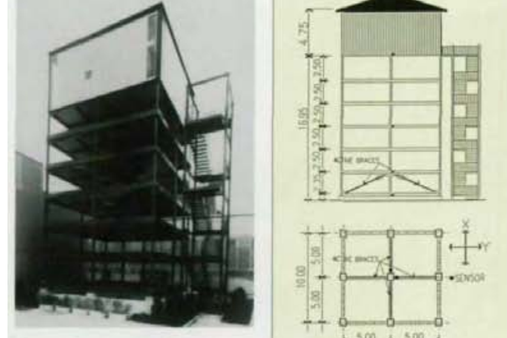


Figure 1: Experimental test building in Tokyo featuring "smart" braces

1993: Active bracing systems come through their full-scale testing with flying colors.

1993: *MSC* introduces an annual listing of shape availability. The list has since moved to the AISC website and rather than being updated yearly, it's now updated each time a producer makes a change.

1993: *MSC* focuses an entire issue on design responsibility following a day-long session at the NSCC.

1991: *MSC* makes its first references to Electronic Data Interchange (EDI), the precurser to today's BIM.

1991: *MSC* begins talking about the recycled content of structural steel and its environmental advantages.

1993: A feature story on Lev Zeltin (written before his death but published afterwards) starts a series of profiles in *MSC*. Other notables featured include: Bill LeMessurier, Stan Lindsay, Eli Cohn, Larry Griffis, Richard Weingardt, Bob Disque, and Shankar Nair.

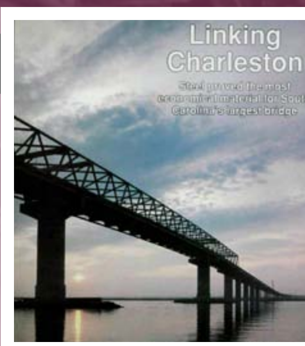
1992: The Boston University Medical Center Campus is one of the first buildings designed using the new AISC LRFD Seismic Provisions.

1992: Steel Interchange premieres.

1991 — 1992 — 1993

1991: *MSC* begins publishing monthly!

1992: From groundbreaking to occupancy took only 22 months on the 1.2 million sq. ft. GTE Telephone Operations Center in Dallas. The building was designed using LRFD and featured A572 Gr. 50 steel.



1992: Parallel chord trusses on the Cooper River Bridge helped to create one of the nation's most beautiful bridges.

1993: The use of in-wall beams and web openings for mechanical ductwork allowed the designers of Harborside Hyatt in Boston to achieve an 8 ft 9 in. floor-to-floor height while also beating concrete on cost.

1991: An accident on Chicago's Calumet Expressway destroys two of an overpasses three columns—yet the structure stays up!

1992: *MSC* tackles economic steel design with an entire issue devoted to advice on how design engineers can reduce fabrication costs.

1993: The Alsea Bay Bridge Replacement was noteworthy for its economic design but it was the bridge's outstanding aesthetics that earned it a Prize Brige Award.