

WILLIAM McGUIRE
121 Simsbury Drive
Ithaca, New York

I. Personal Data

Born: December 1920, Staten Island, New York
Married: Barbara Weld McGuire
Children: Robert W., Thomas R.

II. Education

B.S.C.E., Bucknell University, 1942
M.C.E., Cornell University, 1947

III. Registration

Licensed Professional Engineer, New York State

IV. Professional and Honorary Societies, Clubs

Honorary Member: American Society of Civil Engineers
Member: National Academy of Engineering, International Association for
Bridge and Structural Engineering, Structural Stability Research
Council, Sigma Xi, Chi Epsilon

V. Employment Summary

1942-45: U.S. Navy. Ensign to Lieutenant. Aircraft maintenance, aircraft carrier,
Pacific fleet.

1946-47: Cornell University. Graduate student.

1946 American Bridge Co., Elmira (summer). Steel detailer.

1947-49: Jackson & Moreland, Engrs., Boston. Structural engineer. Design of power
plants and atomic energy projects.

1949 to present: Cornell University. Assistant Professor, 1949-1952; Associate Professor,
1952-60; Professor, 1960 to 1988, Professor Emeritus, 1989. Director of
School of Civil Engineering, 1966-68. (Summary of Cornell academic
activity in Section VII below.)

- 1950, 1951: H. F. Eckerlin, Engr., Syracuse (summers). Structural engineer. Design of commercial and industrial buildings.
- 1952: C. A. Maguire, Engr., Boston (summer). Structural engineer. Design of bridges.
- 1954, 1955-56, 1957: Pittsburgh-Des Moines Steel Co., Pittsburgh (2 summers and sabbatic year). Structural engineer. Design of wind tunnels and special structures, e.g., solar furnace. Bridge erection planning.
- 1968-70: Asian Institute of Technology, Bangkok (2 year leave from Cornell). Taught graduate courses in structural engineering and supervised graduate research.
- 1972-73: National Bureau of Standards, Gaithersburg, Visiting Research Engineer, progressive collapse research. University of Canterbury, Christchurch, Visiting Lecturer. University of Western Australia, Perth, Gledden Senior Visiting Fellow. (Sabbatic year).
- 1979: University of Tokyo, Tokyo (sabbatic semester). Visiting Professor, Japan Society for the Promotion of Science Fellowship.
- 1985-86: University of Liege, Liege. Strathclyde University, Glasgow. Visiting Professor. (Sabbatic year).

VI. Independent Consulting (sample assignments)

- 1950: Vee-D-X Corp. Design of guyed towers.
- 1954-56: Armco Steel Corp. Design of rigid frame buildings.
- 1956-63: Power Reactor Development Corp. Study of containment capacity of fast breeder reactor (Fermi Plant).
- 1958-62: Cornell University. Preliminary planning of Arecibo, Puerto Rico, Observatory.
- 1959: Buckminster Fuller. Design of Museum of Modern Art exhibit.
- 1959: Cornell University. Fall Creek suspension bridge design.
- 1967: Gibbs & Hill, Engrs. Prestressed concrete nuclear containment vessel studies.

- 1971-86: Cornell University (National Astronomy and Ionosphere Center). Evaluation of proposals for upgrading Arecibo Observatory. Consultant on structural problems and structural maintenance of a very large radio telescope.
- 1972-74: Republic Steel Corp. Consultant on industrial building failure.
- 1977-83: Central Hudson Gas & Electric Corp. Consultant on implosion of large steam generator (Roseton Plant) .
- 1978: Armco Steel Corp. Consultant on roof systems.
- 1979-82: National Bureau of Standards. Consultant on structural integrity of U.S. Olympic structure, Lake Placid. Consultant on investigation of Hyatt Regency Walkway collapse and East Chicago ramp collapse.
- 1980: Balzarini, Carey, Maurizi, Attorneys. Consultant on bridge demolition accident (Brady Street Bridge, Pittsburgh).
- 1982: C. Lindbergh & Assoc. Engrs. Review of the design of the structure of a very large engine test facility (Tullahoma, Tennessee).
- 1987: Skidmore, Owings & Merrill, Architect Engineers. Consultant on computer aided design software development.
- 1987: Visual Edge Ltd. Development of ELRFD, an electronic version of the AISC LRFD Specification.
- 1988: OSHA. Consultant on investigation of L'Ambiance Plaza Collapse.
- 1990: National Research Council, Transportation Research Board. Development of a Load and Resistance Factor Design Specification for Highway Bridges.
- 1991-97; Cornell University (NAIC). Consultant on upgrading of Arecibo Radio Telescope (ground screen and Gregorian feed)

VII. Principal Academic Activities

1. Teaching
Courses in elementary and advanced structural analysis, elementary and advanced steel design, elementary and advanced concrete design, foundation engineering.
2. Advising
Advisor to five classes of undergraduates and more than 100 graduate students.

3. Committees and Administrative Assignments (Cornell)
 - a) Advisor to ASCE Student Chapter, 1951-54.
 - b) Student placement officer, 1951-54.
 - c) Civil Engineering Curriculum Committee, 1957-68. Chairman, 1957-60.
 - d) Engineering College Policy Committee, 1963 to 1966, 1975-78. Chairman, 1965, 1977.
 - e) University Committee on Quality of Undergraduate Instruction, 1963 to 1964.
 - f) Cornell Centennial Campaign Committee, Vice-Chairman, 1965.
 - g) Committee on Reorganization of Civil Engineering School, 1965 (Chairman).
 - h) University Faculty Committee on Relationships Between the Cornell Aeronautical Laboratory and Cornell University, 1966-67.
 - i) Civil Engineering Representative to Graduate School, 1966-68, 1975-78.
 - j) Faculty Council of Representatives (Academic Senate), 1971-72, 1974-77.

4. Research

- A. Current Interests

1. Nonlinear analysis and design of two- and three-dimensional steel frame structures.
 2. Nonlinear torsional-flexural behavior of steel members and frames.

- B. Earlier Interests

1. High strength steel reinforcement
 2. Structural steel connections
 3. Progressive collapse of structures
 4. Welding of thin steel
 5. Transmission tower behavior
 6. Fatigue of crane runway girders

5. Writing (See Appendix)

VIII. Lectures, Seminars, Short Courses

1. Invited Lectures

- a) Keynote address, 1984 American Institute of Steel Construction National Engineering Conference.
 - b) 1978, 1985, 1993, 1999 Mexican Society of Structural Engineers Symposia on Metal Structures.
 - c) Keynote address, 1977, 1985, and 1989 Australian Institute of Steel Construction Conferences on Steel Developments.
 - d) 1973 Australian Institute of Steel Construction Conference on Steel Developments.

2. Seminars

- a) American Universities: Arizona, Michigan Technological University, Clarkson College of Technology, Purdue, Case Western, Arizona State (1981 Prince Visiting Scholar), Syracuse, RPI, Lehigh, Colorado (1988 Boase Lecture), Washington University, Johns Hopkins (1993 Carroll Lecture), SUNY Buffalo, Minnesota, Penn State (1996 Kavanagh Lecture), West Point
- b) Foreign Universities: Canterbury, New South Wales, South Australia, Western Australia, National Taiwan, Tokyo, Kyoto, Hiroshima, Kyushu, Osaka, Kobe, Tskuba, Liege, Strathclyde, Glasgow, Dundee, Cambridge, Milan, Carleton
- c) American Industry:
Eastman Kodak, Rochester, 1975; AISC, Dallas, 1984.

3. Short Courses

- a) Steel design for practicing engineers. Melbourne, Sydney, 1977. Perth, 1973.
- b) AISC steel design lectures. Syracuse, Buffalo, Rochester, Albany, 1972, 1975, 1987, 1991.
- c) Cold formed steel design. Cornell, 1971.

IX. Professional Activities

- a) Group Coordinator, Steel Building Group, Council on Tall Buildings and Urban Habitat (1975-85)
- b) Member, AISC Specification Committee (1985-91)
- c) Member, AWS Subcommittee on Design (1975-90)
- d) Member, ASCE A7 Task Committee on General Provisions (1975-90)
- e) Member, AISI Subcommittee on Welding of Cold Formed Steel (1975-85)
- f) President, Ithaca Section, ASCE (1962)
- g) Member, Educational Advisory Committee, AISC (1973-77)
- h) Member, Awards Jury, Lincoln Arc Welding National Professional Design Competition (1973)
- i) Member, Awards Jury, AISC Architectural Awards (1987)
- j) Emeritus Member, AISC Specification Committee (1998-99)

X. Honors

- a) US Navy letter of commendation (for service in action), 1945
- b) Norman Medal, ASCE, 1962 and 1994
- c) Professor of the Year award, Cornell Chapter, Chi Epsilon, 1979
- d) Special Citation Award, American Institute of Steel Construction, 1982
- e) Distinguished Alumnus Award, Bucknell University, 1987.
- f) Shortridge Hardesty Award, ASCE, 1992
- g) T. R. Higgins Lectureship Award, AISC, 1992
- h) Who's Who in America
- i) Honorary Member, ASCE, 1994
- j) National Academy of Engineering, 1994
- k) Geerhard Haaijer Award, AISC, 2000
- l) Lynn Beedle Award, SSRC, 2005

APPENDIX
PUBLICATION LIST

A. TEXTBOOKS

McGuire, W., R. H. Gallagher, and R. D. Ziemian, Matrix Structural Analysis, 2nd Ed., J. Wiley, 2000

McGuire, W., and R. H. Gallagher, Matrix Structural Analysis, J. Wiley, 1979

McGuire, W., Steel Structures, Prentice-Hall, 1968

B. MONOGRAPHS AND HANDBOOKS

McGuire, W., "Chapter 3.1, Introduction to Connection Design," and "Chapter 8.1, Computer-Aided Analysis," Constructional Steel Design, An International Guide, Elsevier, 1992

McGuire, W., "Chapter 1, Introduction," Steel Beam-to-Column Building Connections, J. Const. Steel Res., Vol. 10, 1988.

"Chapter SB-1, Commentary on Structural Steel Design," Structural Design of Tall Steel Buildings, W. McGuire, Chairman of Chapter Committee, ASCE, 1979.

McGuire, W., "Section 7, Part 2, Reinforced Concrete," Civil Engineering Handbook, L. C. Urquhart, Chief Editor, 4th Ed., McGraw-Hill, 1959.

C. TECHNICAL AND PROFESSIONAL PAPERS

Ziemian, R. D. and McGuire, W., "Modified Tangent Modulus Approach, A Contribution to Plastic Hinge Analysis" Journal of Structural Engineering, ASCE, Vol. 128, No. 10, Oct, 2002

McGuire, W., and Ziemian, R. D., "Steel Frame Stability: Out-of-Plane Effects" Proceedings, First Int'l Conf. on Structural Stability and Dynamics, National Taiwan University, Taipei, Taiwan, Dec., 2000

McGuire, W., and Ziemian, R. D., "On Levels of Analysis in Steel Frame Design" Proceedings, Sixth International Symposium on Steel Structures, Puebla, Mexico, November, 1999.

McGuire, W., "Structural Engineering – Some Trends and Future Directions", T. C. Kavanagh Lecture, Pennsylvania State University, University Park, 1996

Chen, C-S, Deierlein, G. G., and McGuire, W., "Finite Rotation Effects in 3-D Frame Analysis", Proceedings, Tenth Engineering Mechanics Conference, ASCE, Boulder, May, 1995.

Attalla, M. R., Deierlein, G. G., and McGuire, W., "Spread of Plasticity: A Quasi-Plastic Hinge Approach", Journal of Structural Engineering, ASCE, Vol. 120, No.8, August, 1994.

McGuire, W., "Toward Nonlinear Analysis and Design of Steel Structures," Proceedings, Sixth National Symposium on Steel Structures, Oaxaca, Mexico, November 1993.

Ziemian, R. D., McGuire, W., and Deierlein, G. G., "Inelastic Limit States Design Part I: Planar Studies and Part II: Three-Dimensional Frame Study" Journal of Structural Engineering, ASCE, Vol. 118, No. 9, September, 1992

McGuire, W., "Computers and Steel Design," Higgins Lecture, Engineering Journal, AISC, 4th Quarter 1992.

McGuire, W., "Comments on L'Ambiance Plaza Lifting Collar/Shearheads," Jl. Performance of Const. Facilities, ASCE, Vol. 6, No. 7, May 1992.

Deierlein, G. G., and McGuire, W., "The Use of 2nd-Order Inelastic Analysis to Estimate Frame Stability for Design," Proceedings, 1990 Technical Session, Structural Stability Research Council, St. Louis, April 1990

Ziemian, R. D., White, D. W., Deierlein, G. G., and McGuire, W., "One Approach to Inelastic Analysis and Design," Proceedings, AISC 1990 National Steel Construction Conference, Kansas City, March 1990.

McGuire, W., "Education for Steel - Prospects and Problems," Proceedings, Pacific Structural Steel Conference, 1989, Aust. Inst. of Steel Const., Sydney, May 1989.

McGuire, W., "Extended End Plate Moment Connections," Proceedings, International Colloquium on Bolted and Special Structural Connections, IABSE, Moscow, May 1989.

Deierlein, G. G., Abel, J. F., McGuire, W., and Srivastav, S., "Some Interactive Graphics and Parallel Processing for Earthquake Engineering," Computer Utilization in Structural Engineering, edited by J. K. Nelson, ASCE, San Francisco, May 1989.

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Greschik, G., White, D. W., and McGuire, W., "Evaluation of Rotation Capacity of Wide-Flange Beams Using Shell Finite Elements," Proceedings of the ASCE Structures Congress, ASCE, New York, May 1989

Ziemian, R. D., and McGuire, W., Discussion on "Second-order Elastic Frame Analysis for Frame Design," Journal of Structural Engineering, ASCE, Vol. 115, No. 2, Feb. 1989.

Sutharshana, S., and McGuire, W., "Non-Linear Response Spectrum Method for Three-Dimensional Structures," Earthquake Engineering and Structural Dynamics, Vol. 16, 1988, pp. 885-900.

McGuire, W., "Research and Practice in Computer-Aided Structural Engineering," A. J. Boase Lecture, Univ. of Colorado, Boulder, March 1988.

White, D. W., and McGuire, W., Discussion on "Uniaxial Cyclic Stress-Strain Behavior of Structural Steel," Journal of Engineering Mechanics, ASCE, Vol. 112, No. 11, November 1987, pp. 1803-1806.

White, D. W., and McGuire, W., "Detailed Modeling of the Cyclic Response of Structural Steel Frame Subassemblages," Proceedings of Ninth World Conference on Earthquake Engineering, 1990

Phoenix, S. L., Johnson, H. H., and McGuire, W., "Condition of Steel Cable After Period of Service," Journal of Structural Engineering, ASCE, Vol. 112, No. 6, June 1986.

Yang, Y. B., and McGuire, W., "Joint Rotation and Geometric Nonlinear Analysis," Journal of Structural Engineering, ASCE, April 1986.

Yang, Y. B., and McGuire, W., "A Stiffness Matrix for Geometric Nonlinear Analysis," Journal of Structural Engineering, ASCE, April 1986.

McGuire, W., and Castañer, J. L., "Computer Aided Limit States Design," Proceedings of the Third Conference on Steel Developments, Australian Institute of Steel Construction, May 1985.

Yang, Y. B., and McGuire, W., "A Work Control Method for Geometrically Nonlinear Analysis," NUMETA 85 -- Numerical Methods in Engineering: Theory and Applications, A. A. Balkema, Rotterdam, 1985, pp. 913-921.

Pesquera, C. I., and McGuire, W., "Interactive Limit States Design of Steel Frames," Final Report, 12th Congress, IABSE, Vancouver, Sept. 1984, pp. 463-470.

Yang, Y. B., and McGuire, W., "A Procedure for Analyzing Space Frames with Partial Warping Restraint," International Journal for Numerical Methods in Engineering, Vol. 20, No. 8, Aug. 1984, pp. 1377-1398.

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McGuire, W., "Structural Engineering for the 80's and Beyond," Engineering Journal, AISC, Second Quarter, 1984, pp. 77-88.

Yang, Y. B., and W. McGuire, "Effects of Joint Moments and Warping on Stability," Proceedings 5th ASCE-EMD Conference, ASCE, August, 1984.

Sutharshana, S., and W. McGuire, "Design of Three-Dimensional Frames Using Interactive Computer Graphics," Proceedings, 8th World Conference on Earthquake Engineering, IAEE, July, 1984.

Kulhawy, F. H., W. A. Wood, and W. McGuire, "Response of Transmission Line Structures to Differential Foundation Movement," Proceedings, 3rd Conference on Ground Movements and Structures, University of Wales Inst. of Science and Technology, Cardiff, July, 1984.

McGuire, W., "Structural Engineering for the 80's and Beyond," (Keynote Address), AISC National Engineering Conference, March, 1984.

McGuire, W., and C. I. Pesquera, "Interactive Computer Graphics in Steel Analysis/Design -- A Progress Report," AISC Engineering Journal, Third Quarter, 1983

Pesquera, C. I., and W. McGuire, "Design of Steel Frames with Interactive Computer Graphics," Instability and Plastic Collapse of Steel Structures, Granada Publishing Ltd., London, 1983.

Yang, Y. B., and W. McGuire, "Interactive Specification of Partial Warping Restraint," Recent Advances in Engineering Mechanics and Their Impact on Civil Engineering Practice, ASCE, May 1983.

Abel, J. F., W. McGuire, and A. R. Ingraffea, "Computer Graphics for Three-Dimensional Structural Analysis," Proceedings, 8th Conference on Electronic Computation, ASCE, February, 1983.

Pesquera, C. I., W. McGuire, and J. F. Abel, "Interactive Graphical Preprocessing of Three-Dimensional Framed Structures," Computers and Structures, Vol. 17, No. 1, 1983

Gross, J. L., and W. McGuire, "Analysis for Progressive Collapse Resistant Design," Journal of Structural Engineering, ASCE, Vol. 109, No. 1, Jan. 1983.

Orbison, J. G., W. McGuire, and J. F. Abel, "Yield Surface Applications in Nonlinear Steel Frame Analysis," Computer Methods in Applied Mechanics and Engineering, Vol. 33, Nos. 1-3, 1982

Pekoz, T., and W. McGuire, "Sheet Steel Welding," Journal of Structural Engineering, ASCE, Vol. 107, No. 8, August, 1981.

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Gattass, M., J. G. Orbison, C. I. Pesquera, M. A. Schulman, W. McGuire, and J. F. Abel, "Interactive Graphics Dynamic Analysis of Frames," Dynamic Response of Structures: Experimentation, Observation, Prediction and Control, ASCE, January, 1981.

Greenberg, D. P., J. F. Abel, and W. McGuire, "Interactive Computer Graphics in Structural Engineering," Final Report, 11th Congress, Vienna, IABSE, September 1980.

Gross, J. L., T. A. Mutryn, and W. McGuire, "Computer Graphics and Nonlinear Frame Analysis," Proceedings, 7th Conference on Electronic Computation, ASCE, August, 1979.

Abel, J. F., D. P. Greenberg, W. McGuire, and R. H. Gallagher, "Interactive Graphics for Finite Element Analysis," Proceedings, 7th Conference on Electronic Computation, ASCE, August, 1979.

Gross, J. L., T. A. Mutryn, and W. McGuire, "Computer Graphics in Nonlinear Design Problems," Canadian Journal of Civil Engineering, Vol. 6, No. 1, March 1979.

McGuire, W., "Interactive Computer Graphics and the Design of Steel Frames," First Symposium on Metal Structures, Mexican Society of Structural Engineers, July, 1978.

McGuire, W., "The Simple Design -- Wind Connection Method" (Keynote Address), Proceedings, 2nd Conference on Steel Developments, Australian Institute of Steel Construction, May, 1977.

McGuire, W., "Structural Welding of Sheet Steel," Proceedings, 2nd Conference on Steel Developments, Australian Institute of Steel Construction, May, 1977.

McGuire, W., and E. V. Leyendecker, "Analysis of Non-Reinforced Masonry Building Response to Abnormal Loading and Resistance to Progressive Collapse," NBSIR 74-526, Center for Building Technology, National Bureau of Standards, November 1974.

McGuire, W., "American Universities and Developing Countries," Cornell Engineering Quarterly, Vol. 9, No. 3, Autumn, 1974.

McGuire, W., "Prevention of Progressive Collapse," Proceedings, ASCE-IABSE Regional Conference on Tall Buildings, Bangkok, January, 1974.

McGuire, W., "Remodelling the Arecibo Radio Telescope," Proceedings, 1st Conference on Steel Developments, Australian Institute of Steel Construction, May, 1973.

Kato, B., and W. McGuire, "Analysis of T-Stub Flange-To-Column Connections," Journal of the Structural Division, ASCE, Vol. 99, No. 5, May, 1972.

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McGuire, W., "Engineering for Human Needs," Cornell Engineering Quarterly, Vol. 2, Spring 1967.

Douty, R. T., and W. McGuire, "High Strength Bolted Moment Connections," Journal of the Structural Division, ASCE, Vol. 91, No. 2, April, 1965.

Douty, R. T., and W. McGuire, "High Strength Bolted Connections with Applications to Plastic Design," Preliminary Publications, 7th Congress, Rio de Janeiro, IABSE, August, 1964.

Douty, R. T., and W. McGuire, "Research on Bolted Moment Connections -- A Progress Report," Proceedings, AISC National Engineering Conference, 1963.

McGuire, W., and G. P. Fisher, "Containment Studies for an Atomic Power Plant," Transactions, American Society of Civil Engineers, Vol. 126, 1961

McGuire, W., and G. P. Fisher, "Containment Studies of the Enrico Fermi Atomic Power Plant," Proceedings of a Symposium at the Royal College of Science and Technology, Glasgow, May, 1960.

List and Description of Major Awards Received by William McGuire

Norman Medal

The Norman Medal is the most prestigious award, and one of the oldest (1872), presented by the American Society of Civil Engineers (ASCE). This honor recognizes the authors of a paper that is judged worthy of special commendation for its merit as a contribution to engineering science. Papers may be taken from any of the seven areas of civil engineering which include over fifty possible journals. Professor McGuire has won the award twice; once in 1962 for his work on atomic power plant containment design, and again in 1994 for his work in applying nonlinear analysis to structural design.

Shortridge Hardesty Award

This award is given annually to a member of ASCE who has contributed substantially in applying fundamental results of research to the solution of practical engineering problems in the field of structural stability. Professor McGuire received this award in 1992 for his contributions in design methods related to the flexural-torsional stability of beam-columns.

T.R. Higgins Lectureship Award

This is the top award presented by the American Institute of Steel Construction (AISC). It recognizes an outstanding lecturer and author whose technical paper or papers are considered an outstanding contribution to the engineering literature on fabricated structural steel. The award is based on two criteria: (1) his/her reputation as a lecturer and (2) the paper's originality, clarity of presentation, contribution to engineering knowledge, future significance and value to the fabricated structural steel industry. Professor McGuire was honored in 1992 for his application of computer graphics to the structural engineering industry.

Geerhard Haaijer Award

The Geerhard Haaijer Educator Award, named for one of AISC's most respected Vice Presidents of Technology and Research, is given in special recognition to individuals who have had a profound and lasting impact in developing a unique application for engineering practice or in the mentoring of future technical leaders. This prestigious award also honors those who, through their research and teaching, have had an outstanding impact on advancing the use of structural steel framing in the construction industry. Bill McGuire received this award in 2000 and was the second of only three people who have been honored in this way.

Beedle Award

In April of 2005, Bill McGuire received the Structural Stability Research Council's highest honor, the Beedle Award. Recipients of the award must be a worldwide leader in stability research and/or design of structures with significant stability issues. They must also be a leader in fostering cooperation between professionals worldwide, thereby making significant contributions to national and international design code development.

Bill McGuire was specifically noted as a scholar who made sure significant advances in research and design methodologies always appeared in the latest design specifications.

National Academy of Engineering

Perhaps the single greatest recognition of any engineer is election into the National Academy of Engineering (NAE). The procedures for nomination and election of member and foreign associate candidates involve a search in all fields of engineering by present members of the NAE for outstanding engineers with identifiable contributions or accomplishments in engineering research, practice, or education, including, where appropriate, significant contributions to the engineering literature. Elected members are recognized by associates and others for their professional integrity and are often pioneers of new fields of engineering, individuals who have made major advancements in traditional fields of engineering, and/or those who have developed and implemented innovative approaches to engineering education. Bill McGuire was elected into the NAE in 1994 and continues to be an active member of the Academy today.