

# COLIN B. BROWN

Curriculum Vitae (last updated in 2000)

COLIN B. BROWN, married - two children - born January 15, 1929

## EDUCATION

University of London, King's College, B.Sc. (Eng.), A.K.C., 1953

University of Minnesota, Ph.D., 1962

## FULL TIME PROFESSIONAL WORK (1953-1959)

Design Engineer; Donovan H. Lee, Consulting Engineer, London.

Design of prestressed concrete, steel and reinforced concrete structures in U.S.A., India, Australia, and England. 1953-55.

Design and Resident Engineer; Lindsey County Council, Lincoln.

Design of bridges, supervision of construction. 1955-57.

Design and Resident Engineer, British Columbia Department of Highways. Design of large steel and concrete bridges.

Supervision of construction in the north of the Province of prefabricated timber, steel and concrete bridges. 1957-59.

## ACADEMIC WORK (1959 to date)

Research Fellow, Department of Aeronautics and Engineering

Mechanics, University of Minnesota. 1959-62.

Assistant Professor of Civil Engineering, University of California, Berkeley. 1962-66.

Associate Professor, Department of Civil Engineering and Engineering Mechanics, Columbia University, New York. 1966-69.

Associate professor of Civil engineering, University of Washington, Seattle. 1969-70

Professor of Civil Engineering, University of Washington, Seattle. 1970-1994.

Professor Emeritus, University of Washington, Seattle. 1994 to date.

Courtesy Professor of Civil Engineering, Oregon State University, Corvallis. 1994 to date

## AWARDS

State Scholar (1950-53)

Ford Foundation Fellow - University of Minnesota (1962)

Premium of the Franklin Institute (\$1,000) for the outstanding paper published in the Journal that year. (1967)

A.S.C.E. - State of the Art in Civil Engineering Award. (1973)

NATO □□□/Senior Fellow, Imperial College, London. (1976)

Erskine Fellow, University of Canterbury, Christchurch, N.Z. (1979). Foreign Research Fellow - Fuzzy Systems and Knowledge Engineering Institute of Guanqzhou University (1986 to 1994)

Honorary Member, American Society of Civil Engineers (1994)

Henry Roy Berg Faculty Lecturer, University of Washington (1994)

Daniel L. and Irma Evans Lecturer, University of Washington (1995)

Kelley Lecturer, Oregon State University (1997)

## PROFESSIONAL REPRESENTATION

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American Society of Civil Engineers

Registered Professional Engineer, British Columbia, Canada

Sigma Xi

Member, ASCE Task Committee on Structural Safety

Member, ASCE Committee on Elasticity, (Chairman 1973-1975)

Associate Editor, Cement and Concrete Research

Associate Editor, Engineering Structures, the Journal of Earthquake, Wind and Ocean Engineering

Member, ASCE Committee on Probabilistic Methods (Chairman, 1980-82)

Member, Sea Ice Mechanics Panel of the N.R.C. (1980)

Editor, Civil Engineering Systems (1983 to date)

Member, Loads Advisory Group of Ship Structure Committee of the NRC (1983-86)

## UNIVERSITY REPRESENTATION

Member, Faculty Council on Planning and Priorities (Chair, 1973-74)

Member, Faculty Council on University Libraries (Chair, 1983-84)

Chair, College Council - College of Engineering (1982-83)

Member, University Senate (1981-83)

Director, Program in Structural and Geotechnical Engineering and Mechanics (1980-83)

Acting Chair, Department of Civil Engineering (1983)

Chair, Faculty Senate (1986-87)

Chair, Department of Civil Engineering (1987-92)

Assistant Provost for Branch Campuses (1990)

## PAPERS AND ARTICLES

80 odd refereed papers published

40 odd non-refereed papers and reports

## REFEREED PUBLISHED PAPERS

1. "Concepts of Structural Safety." Journal, Structural Division, American Society of Civil Engineers. 86: St. 12. 1960.

2. "Energy Dissipation on Contact Friction: Constant Normal and Cyclic Tangential Loading." (with L.E. Goodman), Journal, Applied Mechanics; Transactions, A.S.M.E., 29: E, 1. 1962.

3. "Dead Load Stresses and the Instability of Slopes." (with L. E. Goodman), Journal, Soil Mechanics and Foundation Division, American Society of Civil Engineers. 89: SM 3. 1963.

4. "Gravitational Stresses in Accreted Bodies." (with L. E. Goodman), Proceedings of the Royal Society of London. A. 276. 1963.

5. "Minimum Volumes to Ensure Homogeneity in Certain Conglomerates." Journal of the Franklin Institute. 279:3. 1965.

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6. "Models for Concrete Stiffness with Full and Zero Contiguity": Proceedings, International Conference on the Structure of Concrete, London. 1965.
7. "Automatic Embankment Analysis: Equilibrium and Instability Conditions." (with I. P. King), *Geotechnique*. 16:3. 1966.
8. "Bond Failure Between Steel and Concrete." *Journal of the Franklin Institute*. 282:5. 1966.
9. "The Solution of Problems Involving Darcy's Law." (with R.L.Taylor), Proceedings of the Fifth United States National Congress of Applied Mechanics. 1966.
10. "Darcy Flow Solutions with a Free Surface." (with R. L. Taylor), *Journal, Hydraulics Division, American Society of Civil Engineers*. 93: HY2. 1967.
11. "Modulus and Strength of Reinforced Matrices; Critical Values of Inclusion Concentration." (with N. Mostaghel), *Journal of Materials*. 2:1. 1967.
12. "The Forces on Rigid Culverts Under High Fills." *Journal, Structural Division, American Society of Civil Engineers*. 93: ST.5. 1967.
13. "Pressure Meter Design in Fills with Rock Inclusions." *Geotechnique*. 17:30. 1967.
14. "A study of the Bond Between Steel and Restrained Expanding Concrete." (with Z. S. Szabo), *Magazine of Concrete Research*. 20:62. 1968.
15. "Modification of the Pressures on Rigid Culverts with Fill Procedures." (with S. Pawsey), *Highway Research Record*, No. 249. 1968.
16. "Flexible Culverts Under High Fills." (with D. R. Green and S. Pawsey) *Journal, Structural Division, American Society of Civil Engineers*. 94:St.4. 1968.
17. "Factors Affecting the Damping in a Lap Joint," *Journal, Structural Division, American Society of Civil Engineers*, 94: ST5. 1968.
18. "The Effect of Aggregate Content on the Properties of Concrete," Proceedings, International Conference on Structure, Solid Mechanics and Engineering Design on Civil Engineering, 1969.
19. "On the Necessity of a Non-Slip Mechanism between Steel and Concrete in the Region of a Crack," *Magazine of Concrete Research*, 20:66. 1969.
20. "Paradigms in Structural Design," *Trend in Engineering*, 22:3. 1970.

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21. "Seismic Energy Transmission to Deep-Founded Structures," *Bulletin, Seismological Society of America*, 61:3. 1971.
22. "Damping Sources in Wood Structures," (with C. Y. Yeh and B. J. Hartz), *Journal of Sound and Vibration*, 19:4. 1971.
23. "The Prediction of Damping in Nailed and Glued Wood Structures," (with C. T. Yeh and B. J. Hartz), *Journal of Sound and Vibration*, 19:4. 1971.
24. "Safety of an Elastic Beam-Column," (with R. J. Evans), *Journal, Structural Division, American Society of Civil Engineers*, 98:ST3. 1972.
25. "On the Application of Couple-Stress Theories to Granular Media," (with R. J. Evans), *Geotechnique*, 22:2. 1972.
26. "Slab Avalanching and the State of Stress in Fallen Snow," (with R. J. Evans and E. LaChapelle), *Journal of Geophysical Research*, 77:24. 1972.
27. "Retaining Walls in Seismic Areas," (with M. S. Aggour), *Proceedings Fifth World Conference on Earthquake Engineering, Rome, 1973*.
28. "The Inclusion of Glide and Creep Measurements into Avalanche Mechanics," (with R. J. Evans and D. McClung), *Advances in North American Avalanche Technology; 1972 Symposium, Reno, 1973*.
29. "The Functional Safety of Structures," (with E. C. C. Chang), *Journal of the Franklin Institute*, 296:3. 1973.
30. "Steady State Ground Motions Caused by Single-Well Pumping," (with S. J. Burges), *Water Resources Research*, 9:5. 1973.
31. "Relationship of the Hypercircle Technique to the Energy Theorems," (with R. P. Shubinski), *Journal of the Franklin Institute*, 298:1. 1974.
32. "The Prediction of Earth Pressure on Retaining Walls Due to Compaction," (with M. S. Aggour), *Geotechnique*, 24:4. 1974.
33. "Effect of Glide and Creep on Rigid Obstacles," (with R. J. Evans), *Proceedings of the International Symposium on Snow Mechanics, 1974*.
34. "Effect of Deforestation on Slopes," (with M. S. Sheu), *Journal, Geotechnical Division, American Society of Civil Engineers*, 101:GT2. 1975.
35. "Arrangements of Separate Elastic Bodies," *Journal, Engineering Mechanics Division, American Society of Civil Engineers*, 102:EM6. 1976.

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36. "Evergreen Point Bridge Maintenance Problems," (with D. Christensen and G. Demich), Proceedings, National Structural Engineering Conference, 1976.
37. "Beam-Plate System on Winkler Foundation," (with J. M. Laurent and J. R. Tilton), Journal, Engineering Mechanics Division, American Society of Civil Engineers, 103:EM4. 1977.
38. "AIDJEX Results on Arctic Ice Mechanics," Journal, Structural Division, American Society of Civil Engineers, 103:EM4. 1977.
39. "Resonance of Retaining Walls," (with M. S. Aggour), Engineering Structures, 1. 1978.
40. "The Prediction of Dynamic Pressure Attenuation," (with M. S. Aggour), Proc. Central American conference on Earthquake Engineering, 1978.
41. "The Use of Maximum Entropy in the Characterization of Granular Media," Proc. U.S.-Japan Seminar on Continuum, Mechanical and Statistical Approaches in the Mechanics of Granular Material, Sendai, Japan, 1978.
42. "Analytical Determination of Earth Pressure due to Compaction," (with M. S. Aggour), Proc., Third International Conference on Numerical Methods in Geomechanics, Aachen, 1979.
43. "Evaluation of Methods Used in the Determination of Dynamic Earth Pressure," (with M. S. Aggour), Proc., Second South Pacific Regional Conference on Earthquake Engineering, Wellington, New Zealand, 1979.
44. "The Fuzzification of Probabilities," Proc., Speciality Conference on Probabilistic Mechanics and Structural Reliability, A.S.C.E., Tucson, 1979.
45. "A Fuzzy Safety Measure," Journal, Engineering Mechanics Division, American Society of Civil Engineers, 105:EM5. 1979.
46. "The Merging of Fuzzy and Crisp Information," Journal, Engineering Mechanics Division, American Society of Civil Engineers, 106:EMI. 1980.
47. "Entropy Constructed Probabilities," Journal, Engineering Mechanics Division, American Society of Civil Engineers, 106:EM4. 1980.
48. "Compliance of Assemblage of Unlike Elastic Spheres," (with D. C. Perry), Journal, Engineering Mechanics Division, American Society of Civil Engineers, 107:EM1. 1981.

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49. "Floating Bridge Drawspan Maintenance," (with D. F. Christiansen, J. W. Heavner, M. A. Landy and R. Vasu), *Journal, Structural Division, American Society of Civil Engineers*, 107:ST11. 1981.
50. "Instructions and Opinions: The Use of Fuzzy Subjectivity," (with J. T. P. Yao), *Architectural Science Review*, 25:3. 1982.
51. "Fuzzy Sets and Structural Engineering," (with J. T. P. Yao), *Journal of Structural Engineering, American Society of Civil Engineers*, 109:5. 1983.
52. "The Safety of Structures in the Face of Uncertainty and Imprecision," (with J. Munro), *Proceedings, Fourth International Conference on the Applications of Statistics and Probability in Soil and Structural Engineering*, 1983.
53. "Statistical Mechanics of Granular Materials," (with B. F. Backman, P. W. Jowitt and J. Munro), *Advances in the Mechanics and Flow of Granular Materials*, Ed.: M. Shahinpoor, *Trans. Tech. Publications*, 1983.
54. "Updating Parameters with Fuzzy Entropies," (with T-Y. Kam), *Journal of Structural Engineering, American Society of Civil Engineers*, 109:12. 1983.
55. "Civil Engineering Application of the Theory of Structural Reliability," (with J. T. P. Yao), *Proc., Symposium on Design-Inspection-Redundancy, Marine Structures Committee, Williamsburg*, 1983.
56. "Subjective Probability and Membership Functions," (with B. Mar), *Proc., Fourth ASCE Conference on Probabilistic Mechanics and Structural Reliability, Berkeley*, 1984.
57. "Subjective Modification of Aging Stochastic Systems," (with T. Y. Kam), *Journal of Engineering Mechanics, American Society of Civil Engineers*, 110:2. 1984.
58. "Subjective Seismic Safety Assessments," (with J. L. Johnson and J. J. Loftus), *Journal of Structural Engineering, American Society of Civil Engineers*, 110:9. 1984.
59. "Uncertainty in Civil Engineering Systems: Probability and Fuzzy Sets," (with D. H. Louie), *Civil Engineering Systems*, 1:5. 1984.
60. "Civil Engineering Applications of Fuzzy Sets," (with H. Furuta, N. Shiraishi and J. T. P. Yao), *Analysis of Fuzzy Information, Vol. III*, Ed: J. C. Bezdek, *CRC Press*, 1986.
61. "Incomplete Design Paradigms," *Modelling Human Error in Structural Design and Construction*, Ed: A. S. Nowak, *American Society of Civil Engineers*, 1986.
62. "Jaynes, Bayes and Fuzzy Identification," *Civil Engineering Systems*, 4:3. 1987.

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63. "Recent Civil Engineering Applications of Fuzzy Sets," (with J. T. P. Yao), *Mathematical Modelling*, 9:6. 1987.
64. "Experiments on Disc Arrays: Coordination and Void Entropies," *Micromechanics of Granular Materials*, Ed: M. Satake and J. T. Jenkins, Elsevier Science Publishers, BV, 1988.
65. "Errors in Structural Engineering," (with X. Yin), *Journal of Structural Engineering*, American Society of Civil Engineers, 118:10. 1988.
66. "Optimizing and Satisficing," *Structural Safety*, 7. 1990.
67. "Consistent Crudeness Principles in Design and Forensic Decision Making," (with D. Castaneda), *Civil Engineering Systems*, 8. 1991.
68. "Stability of Masonry Piers and Arches," (with T. E. Boothby), *Journal of Engineering Mechanics*, American Society of Civil Engineers, 118:2. 1992.
69. "Reliability in the Context of Design," (with D.A. Reed), *Structural Safety*, 11. 1992.
70. "Fuzzy Sets Applied to Civil Engineering Systems," *Optimization and Artificial Intelligence in Civil and Structural Engineering*, Kluwer Academic Publishers, 1. 1992.
71. "Civil Engineering Optimizing and Satisficing", *Optimization and Artificial Intelligence in Civil and Structural Engineering*, Kluwer Academic Publishers, 1. 1992.
72. "A General Lower and Upper Bound Theorem of Static Stability," (with T.E. Boothby), *Engineering Structures*, 15:3. 1993.
73. "Seismic Durability of Retrofitted Reinforced-Concrete Columns," (with H.L. Coffman and M.L. Marsh), *Journal of Structural Engineering*, 119:5. 1993.
74. "Entropy Methods in the Constitutive Modelling of a Granular Material," *Powders and Grains*, 93. 1993.
75. "Effects of Column Flexural Strength on the Seismic Response of a Multi-Column Bridge Bent," (with M.L.Marsh), *Earthquake Spectra*, 10:4. 1994.
76. "Methodology for Forensic Investigations of Seismic Damage," (with D.Castaneda), *Journal of Structural Engineering*, American Society of Civil Engineers,120:12. 1994.
77. "Trapped in One's Own Times: the Individual's Relationship to Education and Practice," *Civil Engineering Systems*, 14: 1. 1996.

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78. "Shear Connector Requirements for Embedded Steel Sections," (with C.W.Roeder and R.Chmielowski), Journal of Structural Engineering, American Society of Civil Engineers, 125: 2. 1999.
- 79 "The Role of Risk and Reliability in Engineering Education," (with J.T.P.Yao and F.S.Wong), Stochastic Structural Dynamics, Ed: B.F.Spencer,Jr. and E.A.Johnson, A.A.Balkema,Rotterdam, 1999.
- 80 "Composite Action in Concrete Filled Tubes," (with C.W.Roeder and B.Cameron), Journal of Structural Engineering, American Society of Civil Engineers, 125: 5. 1999.
- 81 "Entropy and Granular Materials: Model," Journal of Engineering Mechanics, American Society of Civil Engineers, 126:6, 2000
- 82 "Entropy and Granular Materials: Experiments," (with D.G.Elms, M.T.Hanson, K.Nikzad and R.E.Worden), Journal of Engineering Mechanics, American Society of Civil Engineers, 126:6, 2000