

## DR. DONALD ALEXANDER BRUCE

<b>EDUCATION</b>	B.Sc. (First Class Honours) Geology and Mineralogy, University of Aberdeen, Scotland Ph.D. Faculty of Science, Engineering Department University of Aberdeen, Scotland D.Sc. University of Aberdeen, Scotland (Under preparation)
<b>PROFESSIONAL QUALIFICATIONS</b>	Chartered Civil Engineer (UK) Fellow, Institution of Civil Engineers (UK) Licensed Geologist Licensed Engineering Geologist
<b>PROFESSIONAL SOCIETIES</b>	Member, American Society of Civil Engineers Member, Hong Kong Institution of Civil Engineers Member, Association of Engineering Geologists Fellow, Geological Society of London Member, Deep Foundations Institute Member, U.S. Society on Dams Member, British National Committee on Large Dams Member, British Geotechnical Society Member, ADSC: The International Association of Foundation Drilling Member, Association of State Dam Safety Officials
<b>PROFESSIONAL COMMITTEES</b>	ASCE Ground Improvement Committee ASCE Grouting Committee (Immediate Former Chairman) ASCE International Activities Committee ADSC Micropile Committee ADSC Epoxy Coated Strand Committee DFI Diaphragm Wall/Slurry Trench Committee (Former Chairman) DFI Micropile Committee (Former Chairman) DFI Deep Mixing Committee International Society of Rock Mechanics (Grouting) International Society Soil Mechanics and Geotechnical Engineering (Ground Improvement – TC-17 Committee – Industry Liaison) International Society for Micropiles (ISM) (Chairman) PTI Ground Anchor Recommendations Committee AUA Technical Committee on Backfill and Contact Grouting of Tunnels and Shafts Euronorm WG10 Deep Mixing

## **PRINCIPAL PROFESSIONAL DISTINCTIONS**

Martin S. Kapp Award Winner 1998: ASCE Geotechnical Division  
Wallace Hayward Baker Award Winner 2004: Geo-Institute of ASCE  
Lecturer - Annual Grouting Course, University of Florida (Formerly Missouri, Rolla) 1988-Present  
Lecturer and Chairman - Annual Short Courses on Geotechnical Engineering University of Wisconsin/Milwaukee, 1989-1999  
Keynote Lecturer - First Canadian International Grouting Seminar, Toronto, 1989  
Invited Lecturer - 3rd Cross Canada Lecture Tour: Tunneling Society of Canada, 1989  
Organizing Committee - Int. Grouting Conference, New Orleans, February, 1992  
Invited Lecturer - First International Symposium and Workshop on Ground Anchors, Mexican Society of Civil Engineers, September, 1994  
International Who's Who, 1994  
Principal Lecturer - Short Course in Ground Treatment, AIT Bangkok, 1996  
Co-Founder – Japanese Association of Micropiles, 1997  
Keynote Speaker – XI PanAmerican Conference, Sao Paolo, Brazil, 1999  
Faculty – ADSC Workshop 2000  
Keynote Speaker – GeoEng2000, Melbourne, Australia 2000  
Organizing Committee, ASCE Conference, Blacksburg, VA 2001  
Organizing Committee and Proceedings Editor, ASCE Grouting Conference, New Orleans 2003  
Lecturer and Organizer – ADSC/DFI/ASCE Short Course Workshops on various topics, 2000-present  
Technical Program Chair and Proceedings Editor, ADSC GeoCubed, Construction Quality Assurance/Quality Control Technical Conference, Dallas, Texas, 2005

## **PROFESSIONAL EXPERIENCE AND BACKGROUND**

PRINCIPAL, GEOSYSTEMS, L.P., PITTSBURGH, PA, MAY 1996 TO PRESENT  
(FORMERLY KNOWN AS ECO GEOSYSTEMS, INC.)

Dr. Bruce formed Geosystems, L.P. and continues to act as President. Geosystems L.P. offers advisory services in the practical and business aspects of specialty geotechnical construction, with a focus on drilling and grouting techniques, anchors, micropiles, deep mixing, cut offs, and in situ reinforcement. The scope of services includes all phases of projects from feasibility assessments to expert witness duties. Dr. Bruce is a member of numerous Boards of Consultants for major projects in North America and elsewhere. Dr. Bruce continues to teach at short courses, seminars, universities and conferences both throughout North America and worldwide, and is active in many national and international technical societies and committees. He also acts as FHWA Principal Investigator for Micropiles and Deep Mixing.

PARTNER, SBMA LLC, JANUARY 2001 TO PRESENT

Dr. Bruce is a Partner in SBMA LLC, a company specializing in designing and supplying high capacity ground anchors.

DIRECTOR, SOLDATA, INC., APRIL 2000 TO PRESENT

Dr. Bruce is a Director of Soldata, Inc., a largely French-owned company based in Rockville, MD specializing in the collection, management and real time display of geotechnical and structural data.

TECHNICAL DIRECTOR, NICHOLSON CONSTRUCTION COMPANY, PITTSBURGH, PA, OCTOBER 1986 - MAY 1996

Dr. Bruce assumed the position of Technical Director, with special responsibility for the transfer and marketing of “European Technologies” to the U.S.A. These technologies were largely the newer developments of the related Rodio group of companies, then one of the world’s largest geotechnical contractors. Dr. Bruce spent much time on sites throughout Europe gaining first-hand experience, especially in ground treatment and ground support. In June 1994, he also became Manager of the Business Development Group before being appointed Manager of the newly formed Technical Services Group a year later following the amalgamation of Nicholson and Rodio in North America. Duties included the management of the Engineering, Safety, and Contracts/Claims Sections. Responsibility was also held for Research and Development, project troubleshooting, process quality initiatives, special project management, and technical writing. He was appointed Vice President in June 1991.

MAIN BOARD DIRECTOR, COLCRETE LTD., WETHERBY, UK, DECEMBER 1983 - SEPTEMBER 1986

Dr. Bruce was promoted as Main Board Director, responsible for the operation of the Geotechnical Engineering Division. This Division encompassed activities worldwide in the field of anchors, micropiles, nails, all forms of grouting, tunnels, structural repair, and fabric formwork. During the period Dr. Bruce headed the Division, volume increased five-fold, and the contribution of the Division to total group volume increased from 10% in 1983 to about 60% in 1986. The major contract won and executed in this period was a tunnel chemical grouting project in Cairo, Egypt, then valued at almost \$4M U.S. Dr. Bruce was also responsible for the company marketing and publicity matters, and undertook over 20 major marketing/technical visits to countries in Western and Southern Europe, North Africa and the Middle East.

MANAGING DIRECTOR, COLCRETE LTD., HONG KONG, JANUARY 1982 - NOVEMBER 1983

Dr. Bruce was appointed Managing Director of the newly formed Hong Kong subsidiary and was responsible for all aspects of the establishment of the new company. Duties were wide-ranging and included marketing, bidding, contract management, technical direction, and financial reporting. Contracts worth over \$3M U.S. were won and executed in this period, and featured the chemical grouting of many sections for tunneling of the Mass Transit Railway, sealing of deep excavations, and the installation of micropiles. At the height of activity, monthly volume ranged from \$300,000 to \$500,000 U.S., and involved 10 expatriates and over 200 locals. During this time, several technical visits were made to tunneling and grouting specialists in Japan, Taiwan, Thailand, and Malaysia.

GROUP TECHNICAL MANAGER, COLCRETE GROUP, WETHERBY, UK, AUGUST 1980 - DECEMBER 1981

Upon his return from Pakistan, Dr. Bruce was appointed Group Technical Manager. His role was involvement with all matters relating to technical development within the Group, including troubleshooting at site level, studies on new techniques or processes, rationalization of existing methods, and delivering both in-house and external lectures and seminars. He was also a member of the "Special Projects Group" and was directly responsible for major projects in the North Sea and Middle East. He also took part in two major market assessment tours with the Managing Director (to U.S.A. and Australia, Far East), both in 1991.

TECHNICAL AND PLANNING MANAGER, COLCRETE-RODIO-KELLER JOINT VENTURE, PAKISTAN, OCTOBER 1979 - JULY 1980

Dr. Bruce was appointed Technical and Planning Manager for the Joint Venture for the massive remedial works executed at Tarbela Dam, on the Indus River. The scope of the duties included responsibility for all scheduling, planning, testing, quality assurance, general technical services, production analyses, and technical reporting. The value of the season's work was then over \$7M U.S., and the staff comprised over 30 expatriates and 350 locals. The work involved rock anchors, soil and rock grouting, slabjacking, and drainage systems.

PROJECT ENGINEER, COLCRETE, LTD., WETHERBY, UK, FEBRUARY 1977 - OCTOBER 1979

Dr. Bruce joined Colcrete, specialist ground engineering contractors, as a Project Engineer. During this time he was responsible for all aspects of the

drilling and grouting work conducted on four major dams in England, and several mine infill sites in Scotland. From February 1979 he also acted as the liaison engineer with VSL in Bern, Switzerland, with respect to rock anchor technology.

PH.D. RESEARCH, DEPARTMENT OF ENGINEERING, ABERDEEN, OCTOBER 1973  
- JANUARY 1977

Donald Bruce joined the Geotechnics Research Group to conduct Doctoral studies under Professor G.S. Littlejohn into the fundamental behavior of prestressed rock anchor systems. This involved very close liaison with specialists worldwide and with contractors in the U.K., with whom two full-scale field trails were organized and conducted. During this period he taught in both the Geology and Engineering Departments of Aberdeen University and acted as anchor consultant to two specialist contractors.

## PUBLICATIONS

1. Littlejohn, G.S. and D.A. Bruce. (1975). "Rock Anchors - Design and Quality Control." 10th Symposium on Rock Mechanics, University of Minnesota, Minneapolis, MN, September 22-24, pp. 77-88, plus discussions, pp. 151-157.
2. Bruce, D.A. (1976). Contribution to Discussion, "Detailed Design of Anchorages," Section IV, A Review of Diaphragm Walls, I.C.E., London, September, pp. 75-76 and 106-109.
3. Littlejohn, G.S. and D.A. Bruce. (1977). "Rock Anchors - State of the Art." Foundation Publications, Essex, England, 50 pp. (Previously published in Ground Engineering in 5 parts, 1975-1976.)
4. Littlejohn, G.S., D.A. Bruce, and W. Deppner. (1978). "Anchor Field Test in Carboniferous Strata." Revue Francais Geotechnique 3 pp. 82-86 (Previously presented at ISSMFE Conference, Tokyo, 1977.)
5. Littlejohn, G.S. and D.A. Bruce. (1979). "Long Term Performance of High Capacity Rock Anchors at Devonport." Ground Engineering 12 (9) pp. 25-33.
6. Bruce, D.A. and C.R.F. George. (1982). "Rock Grouting at Wimbleball Dam." Geotechnique 21 (4) 14 pp.
7. Bruce D.A. (1982). "Aspects of Rock Grouting Practice on British Dams." ASCE Geotechnical Engineering Specialty Conference on Grouting, New Orleans, February 10-12, pp. 301-216.
8. Bruce, D.A. and J.P. Millmore. (1983). "Rock Grouting and Water Testing at Kielder Dam." Quarterly Journal of Engineering Geology 16 (1) pp. 13-29.

9. Bruce, D.A. and G.M. Joyce. (1983). "Slabjacking at Tarbela Dam, Pakistan." Ground Engineering 16 (3) pp. 35-39.
10. Bruce, D.A. and L.A. Bell. (1983). "Cement Bags Bring Solutions to Pipe Laying Problems." Petroleum News, March, pp. 40-41.
11. Bruce, D.A. (1983). "Job Site Report on Diaphragm Wall Blasting." Hong Kong Contractor, April, 2 pp.
12. Bruce, D.A. and C.K. Yeung. (1983). "Minipiling at Hong Kong Country Club", Hong Kong Contractor, November, pp. 13-18.
13. Bruce, D.A. and C.K. Yeung. (1983). "A Review of Minipiling with Particular Regard to Hong Kong Applications." Hong Kong Engineer, June, pp. 31-54.
14. Bruce, D.A. (1984). "The Drilling and Treatment of Overburden." Geodrilling, August and October, 11 pp. (First presented at Drillex 84 Conference, Stoneleigh, Warwks., April, 1984.)
15. Bruce, D.A. and J.N. Shirlaw. (1985). "Grouting of Completely Weathered Granite with Special Reference to the Construction of the Hong Kong Mass Transit Railway," 4th International Symposium, Tunneling 85, Brighton, March 10-15, pp. 253-264.
16. Bruce D.A., J.L. Ingle, and M.R. Jones. (1985). "Recent Examples of Underpinning Using Minipiles." 2nd International Conference on Structural Faults and Repairs, London, April 30 - May 2, pp. 13-28.
17. Bruce, D.A. (1986). "Enhancing the Performance of Large Diameter Piles by Grouting." Ground Engineering 19 (4), 7 pp. and 19 (5) 7 pp.
18. Bruce, D.A. and R.A. Jewell. (1986, 1987). "Soil Nailing: Application and Practice." Ground Engineering 19 (8) pp. 10-15, and 20 (1) pp. 21-38.
19. Bruce, D.A., D.L. Boley, and F. Gallavresi. (1987). "New Developments in Ground Reinforcement and Treatment for Tunneling." Rapid Excavation and Tunneling Conference, New Orleans, June 14-17, Vol. 2, pp. 811-835.
20. Bruce, D.A. (1987). "Tunnel Grouting: An Illustrated Review of Recent Developments in Ground Treatment." International Conference on Foundations and Tunnels, London, March 24-26, pp. 156-173.
21. Bruce, D.A. and R.A. Jewell. (1987). "Soil Nailing: The Second Decade." International Conference on Foundations and Tunnels, London, March 24-26, pp. 68-83.

22. Bruce, D.A. and D.L. Boley. (1987) . “New Methods of Highway Stabilization.” 38th Annual Highway Geology Symposium, Pittsburgh, PA, May 11-13, pp. 57-72.
23. Bruce, D.A. (1987). “Structural Repair by Grouting.” 3rd International Conference on Structural Faults and Repairs, London, July, 21 pp.
24. Bruce, D.A. (1988). “Developments in Geotechnical Construction Processes for Urban Engineering.” Civil Engineering Practice 3 (1) Spring, pp. 49-97.
25. Bruce, D.A. and F. Gallavresi. (1988). “The MPSP System: A New Method of Grouting Difficult Rock Formations.” ASCE Geotechnical Special Publication No. 14, “Geotechnical Aspects of Karst™ Terrains.” pp. 97-114. Presented at ASCE National Convention, Nashville, TN. May 10-11.
26. Bruce D.A. and F. Gallavresi. (1988). “Special Tunneling Methods for Settlement Control: Infilaggi and Premilling.” 2nd International Conference on Case Histories in Geotechnical Engineering, St. Louis, Vol. 2, June 1-5, pp. 1121-1126.
27. Bruce, D.A. (1988). “Urban Engineering and the New Technologies.” 39th Highway Geology Symposium, Park City, UT, August 17-19, 29 pp.
28. Bruce, D.A. (1988). “Pinpiling in the United States - Practice and Potential.” Conference on Developments in Geotechnical Engineering, ASCE and Pennsylvania Department of Transportation, Hershey, PA, September 7-8, 23 pp.
29. Bruce, D.A. (1988). “Practical Aspects of Rock Anchorages for Dams.” Association of State Dam Safety Officials 5th Annual Conference, Manchester, New Hampshire, September 25-28, 26 pp.
30. Bruce, D.A. (1988). “Piling and Insitu Reinforcement.” Deep Foundations Institute 1988 Annual Meeting, Atlanta, GA, October 3-5, 22 pp.
31. Bruce, D.A. (1988, 1989). “Aspects of Minipiling Practice in the United States.” Ground Engineering, 21 (8) pp. 20-33 and 22 (1) pp. 35-39.
32. Bruce, D.A. and P.J. Nicholson. (1988). “Minipiles Mature in America.” Civil Engineering, 58 (12) December, pp. 57-59.
33. Bruce, D.A. and P.J. Nicholson. (1989). “The Practice and Application of Pin Piling.” ASCE Foundation Engineering Conference, Evanston, IL, June 25-29, 19 pp.
34. DePaoli, B., R. Tornaghi, and D.A. Bruce. (1989). “Jet Grout Stabilization of a Peaty Layer to Permit Construction of a Railway Embankment in Italy.” ASCE Foundation Engineering Conference, Evanston, IL, June 25-29, pp. 272-290.

35. Bruce, D.A., B. DePaoli, C. Mascardi, and E. Mongilardi. (1989). "Monitoring and Quality Control of a 100 Meter Deep Diaphragm Wall." DFI International Conference on Piling and Deep Foundations, London, May 15-18, pp. 23-32.
36. Bruce, D.A. (1989). "American Developments in the Use of Small Diameter Inserts as Piles and In Situ Reinforcement." DFI International Conference on Piling and Deep Foundations, London, May 15-18, pp. 11-22.
37. Bruce, D.A. (1989). "Contemporary Practice in Geotechnical Drilling and Grouting." Keynote Lecture, First Canadian International Grouting Seminar, Toronto, April 18, 28 pp.
38. Bruce, D.A. (1989). "Methods of Overburden Drilling in Geotechnical Construction – A Generic Classification." Ground Engineering 22 (7), pp. 25-32. Also published in "Drill Bits - The Official Publication of the International Drilling Federation", Fall 1989, pp. 7, 8, 110, 11, 13, 14.
39. Bruce, D.A., and P. DePorcellinis. (1989). "The RODUR Process of Concrete Dam Repair." Proc. 4th International Conference on Structural Faults and Repairs, London, June 27-29, pp. 63-78.
40. Bruce, D.A. and J.E. Croxall. (1989). "The MPSP Grouting System: A New Application for Raise Boring." Proc. 2nd International Conference on Foundations and Tunnels, London, September 19-21, pp. 331-340.
41. Bruce, D.A. (1989). "An Overview of Current U.S. Practice in Dam Stabilization Using Prestressed Rock Anchors." 20th Ohio River Valley Soils Seminar, Louisville, KY, October 27, 15 pp.
42. Bruce, D.A. and P.J. Nicholson. (1989). "Nicholson PinPiles<sup>sm</sup> on Interstate 78 Structure Dig In." Highway Builder, Summer, pp. 36-38.
43. Bruce, D.A. and J.H. Clark. (1989). "The Stabilization of Shepaug Dam, CT, Using High Capacity Prestressed Rock Anchors." Association of State Dam Safety Officials 6th Annual Conference, Albuquerque, NM, October 1-5, 10 pp.
44. Bruce, D.A. (1989). "The Repair of Large Concrete Structures by Epoxy Resin Bonding." The REMR Bulletin (US Army Corps of Engineers), 6 (4), October, pp. 4-7, and in Association of State Dam Safety Officials Newsletter, 6 (3), May, pp. 7-10.
45. Bruce, D.A. (1990). "The Sealing of Concrete Dams and Their Foundations: Two New Techniques." 10th Annual USCOLD Lecture Series, March 6 and 7, New Orleans, LA. 33 pp.
46. Bruce, D.A. (1990). "Common Sense in Rock Anchoring." Geotechnical News, 8 (1), March, pp. 36-38.

47. Bruce, D.A., S.L. Pearlman, and J.H. Clark. (1990). "Foundation Rehabilitation of the Pocomoke River Bridge, MD, Using High Capacity Preloaded Pinpiles." Proc. 7th Annual International Bridge Conference, Pittsburgh, PA, June 18-20, Paper IBC-90-42, 9 pp.
48. Bruce, D.A. (1990). "Major Dam Rehabilitation by Specialist Geotechnical Construction Techniques: A State of Practice Review." Proc. Canadian Dam Safety Association 2nd Annual Conference, Toronto, Ontario, September 18-20, 63 pp. Also reprinted as Volume 57 of the Institute for Engineering Research, Foundation Kollbrunner-Rodio, Zurich, September.
49. Bruce, D.A. (1990). "Structural Repair of Major Concrete Dams through Epoxy Resin Bonding." Concrete Repair Bulletin, 3 (3), May, pp. 4, 5, 22.
50. Bruce, D.A. and J.W. Pratt. (1990). "A Hydraulic Cut-off through Unconsolidated Mine Dump Material." Association of State Dam Safety Officials, 7th Annual Conference, New Orleans, LA, October 14-18, pp. 417-430.
51. Bruce, D.A. (1990). "The Practice and Potential of Grouting in Major Dam Rehabilitation." ASCE Annual Civil Engineering Convention, San Francisco, CA, November 5-8, Session T13, 41 pp.
52. Bruce, D.A. and B. Bianco. (1991). "Large Landslide Stabilization by Deep Drainage Wells." Proc. ICE International Conference on Slope Stability Engineering, Shanklin, Isle of Wight, UK, April 15-19, 8 pp.
53. Bruce, D.A. and P.H.C. Chan. (1991). "Design, Construction, and Performance of a Deep Circular Diaphragm Wall, Staten Island, New York," Seminar on Tunnels and Underground Construction, Construction Group, ASCE Metropolitan Section, New York, February 4-5, 18 pp.
54. Bruce, D.A. and F.M. Kord. (1991). "A First for Kidd Creek." Canadian Mining Journal, 112 (7), September, October, pp. 57, 59, 62 and 65
55. Bruce, D.A. and P. DePorcellinis. (1991). "Sealing Cracks in Concrete Dams to Provide Structural Stability." Hydro Review, 10 (4), pp. 116-124.
56. Bruce, D.A. (1991). "Equal Rights for Grouters." Geotechnical News, 9- (1), March pp. 47-48. Also in Canadian Dam Safety Newsletter, 2, (2), April, pp. 3-4.
57. Bruce, D.A., P.H.C. Chan, and G.J. Tamaro. (1991). "Design Construction and Performance of a Deep Circular Diaphragm Wall." Proc. ASTM International Symposium on Slurry Walls, Atlantic City, NJ, June 27-28, 12 pp.
58. Bruce, D.A., W.R. Fiedler, M.R. Randolph, and J.D. Sloan. (1991). "Load Transfer Mechanisms in High Capacity Prestressed Rock Anchors for Dams" Association of State Dam Safety Officials, 8th Annual Conference, San Diego, CA, September 29 - October 2, 15 pp.

59. Bruce, D.A. (1991). "The Construction and Performance of Prestressed Ground Anchors in Soils and Weak Rocks: A Personal Overview." Proc. 16th Annual Meeting, DFI, Chicago, October 7-9, 20 pp.
60. Bruce, D.A., W.R. Fiedler, and R.E. Triplett. (1991). "Anchors in the Desert." Civil Engineering, 61 (12), pp. 40-43.
61. Bruce, D.A. and F.M. Kord. (1991) "Grouting with the MPSP Method at Kidd Creek Mines, Ontario." Ground Engineering 24 (8), October, pp. 26, 28, 30, 31, 34, 37, 38, 41.
62. DePaoli, B., B. Bosco, R. Granata, and D.A. Bruce. (1992). "Fundamental Observations on Cement Based Grouts (1) : Traditional Materials." Proc. ASCE Conference, "Grouting, Soil Improvement and Geosynthetics," New Orleans, LA, February 25-28, 2 Volumes, pp. 474-485.
63. DePaoli, B., B. Bosco, R. Granata, and D.A. Bruce. (1992). "Fundamental Observations on Cement Based Grouts (2): Microfine Cements and the Cemill Process." Proc. ASCE Conference, "Grouting, Soil Improvement and Geosynthetics," New Orleans, LA, February 25-28, 2 Volumes, pp. 486-499.
64. Bruce, D.A. (1992). "Progress and Developments in Dam Rehabilitation by Grouting." Proc. ASCE Conference, Grouting, Soil Improvement and Geosynthetics," New Orleans, LA, February 25-28, pp. 601-613.
65. Bruce, D.A. (1992). "Recent Progress in American Pinpile Technology." Proc. ASCE Conference, "Grouting, Soil Improvement and Geosynthetics," New Orleans, LA, Feb. 25-28, pp. 765-777.
66. Bruce, D.A., W.R. Fiedler, G.A. Scott, and R.E. Triplett. (1992). "Stewart Mountain Dam Stabilization." USCOLD Newsletter, 97, (March) pp. 6-10.
67. Bruce, D.A. (1992). "Recent Advances in American Pinpiling Practice." Proc. ICE Conference, "Piling: European Practice and Worldwide Trends," London, April 7-9, pp. 123-130.
68. Bruce, D.A. and R. Gemme. (1992). "Current Practice in Structural Underpinning Using Pinpiles." Proc. NY Met. Section ASCE Seminar, New York, April 21-22, 46 pp.
69. Scott, G.A. and D.A. Bruce. (1992). "Full Scale Field Tests of High Capacity Rock Anchors." Proc. 33rd U.S. Rock Mechanics Symposium, Santa Fe, NM, June 3-6, 10 pp.
70. Bruce, D.A. and F.M. Kord. (1992). "The Stabilization of Loose Backfill by Drilling and Grouting Techniques." Proc. International Symposium on Rock Support, Sudbury, ON, June 16-19, pp. 227-236.

71. Bruce, D.A. (1992). "Two New Specialty Geotechnical Processes for Slope Stabilization." Proc. ASCE Conference, "Stability and Performance of Slopes and Embankments," Univ. California - Berkeley, June 30-July 2, pp. 1505-1519.
72. Bruce, D.A. and R.E. Triplett. (1992). "Environmental Safeguards During Rock Anchoring." Proc. CDSA - CANCEL Joint Conference, Quebec City, Quebec. September 8-12, 13 pp.
73. Bruce, D.A. (1992). "Drilling and Grouting Techniques for Dam Rehabilitation." Proc. ASDSO 9th Annual Conference, Baltimore, MD, September 13-16, pp. 85-96.
74. Nicholson, P.J. and D.A. Bruce. (1992). "Opportunities and Constraints for the Innovative Geotechnical Contractor." ASCE Annual Convention, New York, NY, September 14-17, 20 pp.
75. Bruce, D.A. (1992). "Prestressed Anchorages for Retaining Structures Applications and Construction." ADSC Boston Earth Retention Seminar, Boston, MA, September 30 - October 1, 28 pp. Also presented at Oakland, CA Seminar.
76. Bruce, D.A. (1992). "New Horizons in Ground Anchorages, Pinpiles and Cement Grouting." Ohio River Valley Soils Seminar XXIII, Louisville, KY, Oct. 16, 25 pp.
77. Bruce, D.A., C.H. Hall, and R.E. Triplett. (1992). "Structural Underpinning by Pinpiles." Proc. 17th DFI Annual Meeting, New Orleans, LA. October 21-23, pp. 49-80.
78. Bruce, D.A. (1992). "High Capacity Pinpiles for Structural Underpinning." Proc. 45th Canadian Geotechnical Conference, Toronto, ON, October 26-28, paper 37, 18 pp.
79. Bruce, D.A. and L.K. Nuss. (1992). "Anchoring Stewart Mountain Dam Against Seismic Loadings." Proc. 45th Canadian Geotechnical Conference, Toronto, ON, October 26-28, paper 25, 11 pp.
80. Bruce, D.A. (1992). "Current Technologies in Ground Treatment and In Situ Reinforcement." Proc. 2nd Interagency Symposium on Stabilization of Soils and Other Materials, Metairie, LA, November 2-5, pp. 271-295.
81. Bruce, D.A. and R.H. Bianchi. (1992). "The Use of Post-Tensioned Tendons on Stewart Mountain Dam, Arizona: A Case Study Involving Precision Drilling." Proc. 2nd Interagency Symposium on Stabilization of Soils and Other Materials, Metairie, LA, November 2-5, pp. 5.39-5.54.
82. Bruce, D.A. (1992). "Trends and Developments in American Grouting Practice." Proc. I.C.E. Conference, *Grouting in the Ground*, London. November 25-26, pp 573-589.
83. Bruce, D.A. (1993). "Innovations in American Grouting Practice." Seminar on "Innovation in Construction," Sponsored by ASCE, Metropolitan Section, New York, February 1-2, 22 pp.

84. Bruce, D.A. (1993). "A Review of Drilling and Grouting Methods for Existing Embankment Dams." ASCE Specialty Conference on Geotechnical Practice in Dam Rehabilitation, North Carolina State University, Raleigh, NC, April 25-28, pp. 803-819.
85. Bruce, D.A. (1993). "The Stabilization of Concrete Dams by Post-Tensioned Rock Anchorages: The State of American Practice." ASCE Spec. Conference on Geotechnical Practice in Dam Rehabilitation, North Carolina State University, Raleigh, NC, April 25-28, pp. 320-332.
86. Bianchi, R.H. and D.A. Bruce. (1993). "The Use of Post Tensioned Anchorages on the Arch Portion of Stewart Mountain Dam, Arizona." ASCE Specialty Conference on Geotechnical Practice in Dam Rehabilitation, North Carolina State University, Raleigh, NC, April 25-28, pp. 791-802.
87. Bruce, D.A. (1993). "A Review of Specialty Geotechnical Techniques for Dam Safety." Proc. National Earthquake Conference, Memphis, TN, May, Volume II, pp. 625-635.
88. Bruce, D.A., S.L. Pearlman, and J.R. Wolosick. (1993). "Support of Bridge Piers by High Capacity PinPiles<sup>sm</sup>." Proc. National Earthquake Conference, Memphis, TN, May 3-5, Volume II, pp. 563-573.
89. Bruce, D.A., R. Granata, M. Mauro, and A. PerelliCippo. (1993). "Some Recent Developments in Ground Treatment for Tunneling." Proc. Rapid Excavation and Tunneling Conference, Boston, MA, June 13-17, pp. 93-108.
90. Bruce, D.A., R. Bjorhovde. And J.R. Kenny. (1993). "Fundamental Tests on the Performance of High Capacity PinPiles<sup>sm</sup>." Proc. 18th Annual DFI Conference, Pittsburgh, PA, October 18-20, 33 pp.
91. Bruce, D.A. (1993). "In Situ Earth Reinforcing by Soil Nailing." Chapter 11, "Underpinning and Retention." Edited by S. Thornburn and G.S. Littlejohn. Published by Blackie Academic and Professional, pp. 340-394.
92. Bruce, D.A. (1993). "Contemporary Practice in the Stabilization of Concrete Dams by Post Tensioned Rock Anchors." Ohio River Valley Soils Seminar XXIV, Cincinnati, OH, October 15, 15 pp.
93. Bruce, D.A., E.C. Luttrell, and L.J. Starnes. (1993). "Remedial Grouting Using Responsive Integration<sup>sm</sup>." Proc. ASDSO 10th Annual Conference, Kansas City, MO, September 26-28, 13 pp. Also in Ground Engineering 27 (3), April, pp. 23-29.
94. Groneck, P.B., D.A. Bruce, J.H. Greenman, and G. Bingham. (1993). "PinPiles<sup>sm</sup> Save Silos." Civil Engineering 63 (9), September, pp. 66-68.

95. Bruce, D.A., J.A. Gerlach, B.H. Greene, and A. Schaffer. (1994). "Locking into Success." Civil Engineering 64 (4) April pp. 48-50.
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