

## In memoriam: Dr Douglas William Brown, 1940-2019, BSc DIC PhD MPhil CEng MICE FStructE FBCS.

Doug was born in 1940 in Barnhurst, Kent to a Glaswegian chartered mechanical engineer father, and a Yorkshire mother. He is survived by his wife Jennifer; children Sandra, Ian and James; and three grandchildren.



Doug de-nailing timber as part of his Master's thesis on sustainability and the recycling of housing in 1999.

After A Levels at Surbiton County Grammar School, Doug enrolled at Battersea College of Technology (a few years before it became the University of Surrey) to do a degree in Physics. However after a few weeks he decided that the civil engineering fluids labs looked much more interesting and switched courses. Following graduation Doug spent four years on site, first with Trollope and Colls, then with George Wimpey where his starting salary in 1964 was the princely sum of £950.0.0d per annum.

1966 was a very eventful year: Doug married his childhood sweetheart Jennifer; he became a member of the Institution of Structural Engineers and a chartered engineer at the age of 25; he moved to the design office at Wimpey; and Wimpey sponsored him to do a Diploma of Imperial College. At Christmas, there was an optional week on computing, and that was the start of his love affair with software development. It always tickled Doug that he was one of the last students to do a standalone DIC, as shortly thereafter DICs were awarded as part of a Master's degree. Back in the office, Doug was responsible for the detail design of the Immingham Oil Terminal. Even the big firms didn't have their own computers so Doug would write his software on paper tape and run it on a Honeywell Bull mainframe on a time-share basis. On one occasion he was summoned by the boss at Wimpey as the bill for the computer time was greater than his salary that month!

In 1969, Doug was head hunted by Alan Marshall and Partners to set up their own in-house computing. He chose a Varian computer and it had its own room in their offices at Fitzroy House in Worcester Park. Doug started Fitzroy Computer Systems in 1972 to write books in his "spare" time: "Stanchion Design Charts" and "Reinforced Concrete Design Charts". By 1974 he had risen to partner, and spent several years on committees and giving lectures. He was the Institution of Structural Engineers' representative on the British Standard for Stairs and Walkways, and on the CEB Commission XIV "Programmes de calculs structuraux sur ordinateurs," for which he'd regularly jet off to Paris. He was also an Institution of Civil Engineers technical paper appraiser.

Doug grew disillusioned with the meetings requirements of being a partner, and so branched out on his own in 1978. His parents were horrified he had given up a safe job to write software!

To put food on the table, Doug had two part time jobs; at SW Farmer, a steel working company in Lewisham, and at Sir Robert McAlpine. SW Farmer at that time had won the Queen's Award for Industry and Doug was tasked with setting up a complete computer system for them. So Doug worked out what parts were required and had them delivered to his home to set up the computer and test his software. It was fortunate he had a large study as the £17,000 computer took up a lot of space, and cost as much as a house! (In 1979, the average UK house price rose from £15,000 to £18,500!) The Brown family had a week long house swap with a great uncle and aunt on the Isle of Wight, and Doug was very anxious about leaving the computer!

In 1981/82 Doug wrote SuperSTRESS, a 2D/3D linear elastic structural analysis program, for the Cement and Concrete Association, subsequently marketed by Integer then Graitec. He ran a 'Frame Analysis Postal Service' for the rest of the 1980's which generated the revenue to allow him time to write the code for NL-STRESS, a structural analysis program for 2D/3D elastic, finite displacement, sway or within-member stability, plastic, and collapse, analysis of plane frames & trusses, grids, space frames & space trusses. Doug was very pleased to get Professor Michael Horne (IStructE past president and Gold Medal winner) on board as a consultant to contribute all the plastic analysis and other non-linear theory. Jennifer still remembers Doug's joy at getting a letter of approval in principle from the Department of Transport in January 1986 for NL-STRESS. Doug also wrote SCALE, Structural CALculations Ensemble, to cover the detailed design of steel, concrete, masonry and timber. NL-STRESS and SCALE were sold together as SAND, Structural Analysis and Design.

In 1988, following requests from firms who already had a structural analysis package, and didn't want to pay for a second one, Doug started selling SCALE as a separate product. Doug published a paper in The Computer Journal in January 1990, about the language used in SCALE with his friend Donald Alcock (of Genesys and Illustrating Basic fame, who also illustrated all Fitzroy's manuals) entitled, "PRAXIS: A Program for Reproducing Proforma Design Calculations" by Alcock and Brown. Doug should really have been first author, but he thought it was hilarious to have the names that way round.

In the 1990's he developed further new systems, LUCID and SPADE, covering the detailing of reinforced concrete, structural steelwork, masonry, timber & proprietary products, with daughter Sandra helping digitise the detailing overlays.

In 2001, now in his sixties, Doug completed a Master of Philosophy degree at the University of Nottingham on Recycling Housing, for which Doug and Jen dismantled and rebuilt a house overlooking Bournemouth Bay to demonstrate the sustainability aspects of construction. Bournemouth Bay was always a favourite place for Doug, in the 1970's he loved playing in the waves with his kids, before going for a swim around Bournemouth Pier.

Doug stepped down from managing Fitzroy in 2003, with elder son Ian taking the helm. This gave Doug time to embark on a PhD, and to bring Ian up to speed with the million lines of code that Doug had written and maintained. Doug completed his PhD on "Verifying the correctness of structural engineering calculations" at the University of Surrey in 2006, forty-seven years after he matriculated at its predecessor. He also pursued other avenues, including publishing a paper in The Structural Engineer, "A system for invention" with younger son James, discussing the nature of invention and providing a system to stimulate lateral thinking.

After retiring in 2010, Doug sadly had a long battle with Alzheimer's disease. He loved walking around the New Forest countryside, with Jennifer and James taking turns accompanying him, but having great difficulty keeping up with him. Indeed, a police helicopter was called out on one occasion to try and find him when he had walked halfway to Salisbury! Doug peacefully passed away in May this year with his family by his side.