

Honorary Associate Professor Rob Wheen

Rob Wheen has had a passionate interest in bridges since he first discovered a book about the construction of the Firth of Forth Bridge in his high school library at Coffs Harbour High School. He knew that Civil Engineering was to be his chosen career from that moment.

He is a graduate of the University of Sydney with the degrees Bachelor of Science (1961), Bachelor of Engineering (Hons) (1963) and Master of Engineering Science (1969). He has been a Fellow of the Institution of Engineers, Australia since 1990.

He started with the Department of Main Roads, N.S.W. as a Civil Engineering Trainee in 1958 and upon graduation worked in the Bridge Design Section apart from the year spent in 1966 in the Resident Engineer's office for the construction of the first stage of the Warringah Expressway. The bridges that he worked on included the Roseville Bridge, the Hunter River North Channel, Macquarie River at Dubbo and the Rip Bridge.

His interest in design has led to a lengthy involvement in teaching design since joining the University of Sydney as Lecturer in Civil Engineering in 1969. With colleague Russell Bridge he started the Civil Engineering Design Competitions in 1970 and these have become a widely publicised annual event.

He is the author of over 60 papers covering a quite diverse range of topics. His papers include work on prestressed concrete tension members, on design teaching, on an invention to control construction loads on multi-storey concrete buildings, on construction cost estimating, and on concrete and steel stress-ribbon bridges.

He has been a member of the Concrete Institute of Australia for about thirty years. He was elected to the NSW Branch Committee in 1980 and served on the Federal Council from 1986 to 2003. He has been a member of the Editorial Committee of the Institute's "Concrete in Australia" magazine for some 20 years, for many of them as Convenor of the Committee.

He first expounded his "concrete origami" concept in 1979. Again with Russell Bridge, he produced a series of concrete canoes culminating in *Aurora Australis* which was entered in the First International Concrete Canoe race in Stockholm at the Ninth Congress of the International Prestressed Concrete Federation (FIP) in 1982. The canoes and *Icarus*, a concrete hang-glider which he built and successfully flew for a film on lightweight structures, all demonstrate the concrete origami principles.

With the help of a succession of undergraduate thesis students he has been developing the practical applications of these ideas for the construction of long-span prestressed concrete membrane roofs which are cast flat and lifted into their final positions hanging in tent-like catenaries.

Rob takes a special delight in new concepts, inventions and ideas. He has been consulted by a number of organisations at the very early conceptual design stage of projects and feels this is where he is best able to make a significant contribution. Two examples are his involvement with Reg Redjvani in the development of the Flexible Formwork idea and with Terry Doolan and the Roads and Traffic Authority in the testing of Terry's concrete/timber composite bridge deck modules. The latter investigation included the dynamic loading of two full-scale modules

to half a million cycles of loading in the University's JW Roderick Materials and Structures Laboratory.

He has collaborated with Doug Irvine of Australian Ultra Concrete Floors Pty Ltd in the development and testing of the Ultrafloor system over more than 15 years since the company was first established. The company has grown to be a significant player in the Australian construction industry.

He has been involved in numerous prestressed concrete structural investigations. Two notable examples were both from Canberra. The Cameron Offices at Belconnen required full scale testing of structure assemblies in the laboratory. The Campbell Park study at 1:2.5 scale involved the pretensioning of four large concrete beams in the laboratory for subsequent loading.

One interesting field study that he led was the instrumentation and load testing of the 18m span CSR Humes "Classic" Arch at Pendle Creek under the M4 Motorway. The "Classic" Arch has been widely used since then, incorporating a number of design innovations that he proposed.

He served as a member of the University's Academic Board from 1978 to 1988 and has taken a vigorous interest in all matters to do with public relations for the School of Civil and Mining Engineering and the University.

In the five years preceding his "retirement" at the end of 2004 he served as Head of the School of Civil Engineering at the University of Sydney.

In "retirement" he continues to lecture at the University on a casual basis. He is a member of the Earthquake Roundtable, a group that is attempting to find simple solutions to the challenge of domestic reconstruction following earthquakes such as those in Pakistan and China in the last few years. He is an active participant in the Ocean Nourishment research work of the Ocean Technology Group in Civil Engineering at the University of Sydney. He is currently pursuing ideas with Doug Irvine that may have an impact on the way structures are built in the building industry.