

GIDEON P.A.G. VAN ZIJL (DEng, PhD, PrEng)

Professor of Structural Engineering



BIOGRAPHICAL INFORMATION

Nationality: The Netherlands
Permanent residence: South Africa
Languages: Afrikaans (home), English, Dutch

WORK ADDRESS AND RESIDENCE

Department of Civil Engineering, Stellenbosch University
Division of Structural Engineering and Civil Engineering Informatics
Room S320E, Corner of Banghoek Road and Bosman Street, Stellenbosch, 7600, South Africa
Web site: <http://civeng.sun.ac.za>
Email: gvanzijl@sun.ac.za

EDUCATION

BEng (1986, Civil Engineering, Cum laude), Stellenbosch University
MEng (1990, Civil Engineering, Cum laude), Stellenbosch University
PhD (2000, Civil Engineering) – Delft University of Technology, The Netherlands, promoters Prof.dr.ir. R de Borst, Prof.dr.ir.JG Rots
DEng (2016), Stellenbosch University

PROFESSIONAL APPOINTMENTS

2001-Present Professor of Structural Engineering, Stellenbosch University
2010-2015 Head Department of Civil Engng, SU
2001-2005 2009 2017-2018 Head Division for Structural Engng & Civil Engng Informatics, SU
2001-2004 2006-2009 Postgraduate Program Coordinator, Civil Engng, SU
1999-2009 Research Fellow, Faculty of Architecture, TU Delft
1995-1999 Assistant Researcher, Civil Engng and Geosciences, TU Delft
1992-1995 Lecturer, Civil Engng, SU
1989-1992 Structural Engineer/Project manager, Bureau for Mechanical Engng, SU
1987-1989 Researcher, Institute for Structural Engng, Civil Engng, SU

PROFESSIONAL AFFILIATIONS

Fellow: South African Academy of Engineering (FSAAE)
Fellow: South African Institute of Civil Engineers (FSAICE, nr 202102)
Member: Concrete Society of Southern Africa (MCSSA, nr V124)
Engineering Council of South Africa – professional registration (PrEng 1993)

PROFESSIONAL AND SCIENTIFIC SERVICE

Vice-President, International Association of SHCC
RILEM Educational Activities Committee (EAC) member 2015-2017, 2017-2020
FRAMCOS Board of Advisors (2013-2016) – Fracture Mechanics of Concrete and Concrete Structures
Chairman of RILEM Technical Committee 240-FDS: Framework for Durability of Strain-hardening Cement-based composites (SHCC)
Co-chairman of RILEM TC 208-HFC, sub-committee Durability
Editorial Committees: *fib* Structural Concrete, RILEM Journals Materials and Structures (2010-2015), Concrete/Beton, Guest Editor MDPI Infrastructures Edition Durability of Concrete Infrastructure
Referee for Research Funding bodies in Belgium, Israel, RSA, Singapore, Switzerland, The Netherlands
Reviewer for 37 International and National Journals
Examiner: PhD-candidates at 14 Universities, Nationally and Internationally
Member of Scientific / International Committees of 40+ International Conferences
Member of SABS working group for revision of the Structural Concrete Code
South African National Roads Agency Ltd (SANRAL) Research Panel Category A Member, Structures, Pavements

VISITING PROFESSOR

2010, March Delft University of Technology, The Netherlands, Prof JG Rots
2010, April Technical University Dresden, Dresden, Germany, Prof V Mechtcherine
2010, June Gifu University, Gifu, Japan, Prof K Rokugo
2016, April Nanyang Technological University, Singapore, Profs Min Jen TANG, Chee Kay CHUA
2016, Aug-Sept Delft University of Technology, The Netherlands, Prof JG Rots

RESEARCH INTERESTS

Structural Mechanics; Computational Mechanics
Deterioration mechanisms; corrosion; alkali-silica reaction
Durability of Strain-Hardening Cement-based Composites
Constitutive models for cement-based materials, including concrete, fibre-reinforced concrete, masonry
3D printing of concrete

STUDENT SUPERVISION

Completed: 33 Masters, 15 Doctoral, 2 Postdoctoral
Current: 6 Masters, 7 PhD

RESEARCH GRANTS Total ZAR 29m+ since 2001

The Concrete Institute: 2014-2016, 2017-2019, 2020
IIBCC 2019-2020
Oppenheimer Memorial Trust awards for Sabbatical 2016, 2010
NRF Incentive funding for rated researchers 2010-2017, Durability of SHCC 2008-2010, TDMSES 2007
THRIP Research Grants: SIM 2015-2018, ACM 2012– 2014, ACM-S 2009-2011, SAPERCS 2006-2008, APERCS 2003-2005
Various South African Industry partners 2001-2013
Volkswagen Foundation (Germany) 2003-2005, Extension 2006
Institute of Structural Engineering, Stellenbosch University

HONORS & AWARDS

Research Excellence Awards 2018 & 2019, Research Outputs and PhDs delivered, Stellenbosch University
Lecturer of the year 2012, Engineering Faculty, Stellenbosch University
THRIP/DTI award 2011: Runner up Human Resource Quality and Quantity of students
Rector's award for General Performance/Research 2010, 2012, 2013, 2014, 2015, Stellenbosch University
Upcoming Researcher of the year 2006, Engineering Faculty, Stellenbosch University
Best paper awards: Dr HWH West Award 9th Canadian Masonry Symp. 2001; Materials & Structures top ten papers of 2016; Merit certificate Scholarship of Teaching and Learning 2019; Rapid Prototyping Journal 2019 highly commended award
H.L. Reitz medal for best postgraduate student in Civil Engineering, Stellenbosch University, 1990.
Several merit bursaries for undergraduate and graduate studies (1983-1987)
Harry Crossley award for PhD-studies, 1995
Top Final year Civil Engineering student, 1986
Academic Colours of Stellenbosch University, 1986

Awards to Students supervised

Paper awards at 4 international conferences ACCTA 2013, SCMT3 2013, SCMT4 2016, RILEM Week 2018
Reitz medal for best postgraduate student in Civil Engineering, Stellenbosch Dr Boshoff 2007, Dr C van Dyk 2008, Dr SC Paul 2015, Dr S Zeranka 2017, Dr WI de Villiers 2019
Greenovate 3rd prize M van den Heever & FA Bester 2018
Jac van der Merwe Prize for most innovative Engineering Final Year Project FA Bester 2018

COURSES TAUGHT

Strength of Materials 144 / 143:	2001, 2004, 2005
Strength of Materials 214 / 224:	2001 – 2004, 2017, 2018
Strength of Materials 244 / 254:	2002 - 2005
Construction Materials 244 / 254:	2001-2008
Structural Design: Reinforced Concrete Design 314:	1992 - 1995
Theory of Structures 324 - Introduction to Continuum Mechanics:	2007-2009
Theory of Structures 354 - Finite Element Method:	2005-2015, 2020
Advanced Mechanics of Materials and Modelling (AMMM):	2010-
Cement-based Materials:	2017, 2018

PUBLICATIONS

h-factor

Scopus (Author ID 6603009526)	19
ResearchGate	21
GoogleScholar	23

Author of 250+ books, book chapters, papers and technical reports

SELECTED INTERNATIONAL (PEER REVIEWED) JOURNAL PUBLICATIONS

- [1] Kruger PJ, Seung C, Zeranka S, Viljoen C, van Zijl GPAG 2020. 3D concrete printer parameter optimisation for high rate digital construction avoiding plastic collapse. *Composites Part B: Engineering* 183 (2020) 107660. <https://doi.org/10.1016/j.compositesb.2019.107660>.
- [2] Kruger PJ, van Zijl GPAG, Zeranka S 2019. Ab initio approach for characterisation of nanoparticle-infused 3D printable concrete. *Construction and Building Materials* 224 (Nov 2019):372-386. <https://doi.org/10.1016/j.conbuildmat.2019.07.078>.
- [3] Bezuidenhout SR, van Zijl GPAG 2019. Corrosion propagation in cracked reinforced concrete, towards determining residual service life. *fib Structural Concrete* 20(6) 2183-2193 <https://doi.org/10.1002/suco.201800275>
- [4] Pourbehi MS, van Zijl GPAG, Strasheim JAvB 2019. Analysis of combined seismic loads and alkali-silica reaction in concrete dams considering key chemical-physical-mechanical factors and fluid-structure interaction. *Engineering Structures* 195(2019) 263-273. <https://doi.org/10.1016/j.engstruct.2019.05.087>
- [5] Paul, SC, van Rooyen AS, van Zijl GPAG, Petrik LF 2018. A review of nanoparticles in cement-based materials. *Construction and Building Materials* 189(2018) 1019-1034. <https://doi.org/10.1016/j.conbuildmat.2018.09.062>.
- [6] Dunn TPA, van Zijl GPAG, Van Rooyen AS 2018. Investigating a reinforced lightweight foamed concrete walling system for low-rise residential buildings in moderate seismic regions. *Journal of Building Engineering* 10 (2018) 663-670. [DOI.org/10.1016/j.jobbe.2018.09.011](https://doi.org/10.1016/j.jobbe.2018.09.011).
- [7] Van Zijl GPAG, Wittmann, FH, Toledo Filho RD, Slowik V, Mihashi H 2016. Comparative testing of crack formation in SHCC. *International Journal Materials and Structures* 49(4) 1175-1189. <https://doi.org/10.1617/s11527-015-0567-9>.
- [8] van Zijl GPAG, Folker H, Wittmann, Byung H, Oh, Petr Kabele, Romildo D, Toledo Filho, Eduardo M.R. Fairbairn, Volker Slowik, Atsuhisa Ogawa, Hideki Hoshiro, Viktor Mechtcherine, Frank Altmann, Michael D. Lepech 2012. Durability of strain-hardening cement-based composites (SHCC), *Materials and Structures* 45(10) 1447-1463. <https://doi.org/10.1617/s11527-012-9845-y>.
- [9] Boshoff WP, Mechtcherine V and van Zijl GPAG 2009. Characterising the time-dependent behaviour on the single fibre level of SHCC: Part 1: Mechanism of fibre pull-out creep, *Cement and Concrete Research*, 39 (2009) 779-786. <https://doi.org/10.1016/j.cemconres.2009.06.007>
- [10] Van Zijl GPAG 2007. Improved mechanical performance: Shear behaviour of strain hardening cement-based composites (SHCC). *Cement and Concrete Research*, 37(8) 1241-1247. <https://doi.org/10.1016/j.cemconres.2007.04.009>.
- [11] Van Zijl GPAG 2004. Modeling masonry shear-compression: the role of dilatancy highlighted, *ASCE Journal of Engineering Mechanics*, 130(11) 1289-1296. [https://doi.org/10.1061/\(ASCE\)0733-9399\(2004\)130:11\(1289\)](https://doi.org/10.1061/(ASCE)0733-9399(2004)130:11(1289)).