

Prof Celeste Viljoen, PrEng

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ACADEMIC QUALIFICATIONS

2006: PhD (Structural Engineering), University of Stellenbosch

2001: BEng (Civil Engineering), Cum Laude, University of Stellenbosch

EXPERIENCE

Associate Professor: University of Stellenbosch, 01/2017 – current

Senior Lecturer: University of Stellenbosch, 09/2009 – 12/2016

- Structural Engineering; Reliability and Risk Assessment; Design of reinforced and post-tensioned concrete structures; Continuum mechanics and finite element analysis.
- See attachment for list of publications, postgraduate student supervision, academic modules lectured and courses presented to engineering industry

Director of the Institute for Structural Engineering: University of Stellenbosch, 2010 – current

Head of the division Structural Engineering: University of Stellenbosch, 01/2019 – current

Structural Design Engineer: Element Consulting Engineers, 2004 (part time), 2006 – 2009

- Reinforced- and pre-stressed concrete design; Bridge design; Project specification; Finite Element Analysis
- See attachment for project details

Consultant: Safran Engineering Algorithms, 10/2005 – 12/2005

- Norsk Hydro Pilot Study, Estimation of as-laid static configuration of pipelines on the seafloor from measurement data

NATIONAL AND INTERNATIONAL INVOLVEMENT IN STRUCTURAL STANDARDISATION

JCSS International Joint Committee on Structural Safety, member since 2010

ISO Member of South African Mirror Group for the revision of ISO 2394

Member of ISO TC 98/SC 2/WG 11 for the revision of ISO 13824

SABS Convener of SABS Working Group for the development of SANS 10100-3

Member of SABS TC 98-01 and SABS TC 98-02

SABS TC 98 representative: Revision of ISO 13824

MEMBERSHIPS

ECSA Engineering Council of South Africa

Pr.Eng Reg. No. 20120361

SAICE South African Institute of Civil Engineers

Membership No. 201314

AWARDS

- 2015: Vice-Rectors award for young upcoming researchers (University of Stellenbosch)
- 2014/15: Rectors awards for general performance (University of Stellenbosch)
- 2006: Chancellor's Medal (University of Stellenbosch)
- 2006: Postgraduate student of the year (Department of Civil Engineering)
- 2003: Academic Honours (University of Stellenbosch)
- 2001: Merit Medal - Engineering Student of the year (Engineering Council of South Africa)
- 1998 – 2001: All subjects cum laude; highest class average each year; multiple subject awards

RESEARCH GRANTS AND -FUNDING

- 2016/17/18/19: WRC project K5/2514/1
- 2014/15/16: THRIP CDSS Industry partnership
- 2012/13/14: NRF Thuthuka (Post PhD track)
- 2012/13/14: WRC project K5/2154/1
- 2012/13: Germany-SA year of Science
- 2012/13: Engineering Strategic Fund
- 2011/12/13: THRIP CDSS Industry partnership
- 2005: Wilhelm Frank Stipend for doctoral study abroad
- 2004: Wilhelm Frank Bursary for doctoral study

PUBLICATIONS

Refereed Journals

1. Walls, R., Viljoen, C., De Clercq, H., 2019, *A nonlinear, beam finite element with variable, eccentric neutral axis*, Engineering Structures, 187:341-351, <https://doi.org/10.1016/j.engstruct.2019.02.056>
2. Olalusi, O.B., Viljoen, C., 2019, *Assessment of simplified and advanced models for shear resistance prediction of stirrup reinforced concrete beams*, Engineering Structures, 186:96-109, <https://doi.org/10.1016/j.engstruct.2019.01.130>
3. Fischer, K., Viljoen, C., Kohler, J., Faber, M.H., 2019, *Optimal and acceptable reliabilities for structural design*, Structural Safety 76:149-161
4. Walls, R., Viljoen, C., De Clercq, H., 2018, *Analysis of structures in fire as simplified skeletal frames using a customised beam finite element*, Fire Technology Journal, 54-6:1656-1682.
5. Lenner, R., van Nierop, S., Viljoen, C., 2018, *A comparative study of target reliability index derivation for reinforced concrete structures governed by serviceability limit state*, Structural Concrete DOI: <https://doi.org/10.1002/suco.201800202>
6. Botha, J., Retief, J.V., Viljoen, C., 2018, *Uncertainties in the South African wind load design formulation*, Journal of the South African Institution of Civil Engineering, 60-3:16-29.
7. Botha, J., Retief, J.V., Viljoen, C., 2018, *Reliability assessment of the South African wind load design formulation*, Journal of the South African Institution of Civil Engineering, 60-3:30-40.
8. Lenner, R., De Wet, D.P.G., Viljoen, C., 2017, *Bridge loading and traffic characteristics in South Africa*, Journal of the South African Institution of Civil Engineering, 59-4:34-46
9. Walls, R.S., Viljoen, C., De Clercq, H., Clifton, C., 2017, *Reliability analysis of the Slab Panel Method for the design of Composite Steel Floors in Severe Fires*, Journal of Structural Fire Engineering
10. Walls, R.S., Viljoen, C., 2016, *A comparison of technical and practical aspects of Eurocode 3-1-1 and SANS 10162-1 hot rolled steelwork design codes*, Journal of the South African Institution of Civil Engineering, 58-1:16-25
11. Cloete, G., Retief, J.V., Viljoen, C., 2016, *A Rational Quantitative Optimal approach to dam safety risk reduction*, Civil Engineering and Environmental Systems, 33-1:1-21
12. Reynolds, S., Barnardo-Viljoen, C., 2014, *Evaluating the prioritisation of South African dams for rehabilitation with special focus on risk to human lives*, Journal of the South African Institution of Civil Engineering, 56-3:14-24
13. Barnardo-Viljoen, C., Mensah, K.K., Retief, J.V., Wium, J.A., van Zijl, G.P.A.G, 2014, *Background to the Draft SA National Standard for the design of Water Retaining Structures*, Concrete/Beton, 138:10-19
14. Retief, J.V., Diamantidis, D., Barnardo-Viljoen, C., Van der Klashorst, E., 2014, *Extreme actions and climate change: Experience gained in South Africa and Germany*, Civil Engineering and Environmental Systems, 31:179-188
15. Maincon, P., Barnardo, C., 2013, *An inverse finite element method for the analysis of VIV data*, Marine Structures, 33:143-159
16. Hauser, C., Walz, B., Maincon, P., Barnardo, C., 2008, *Application of inverse FEM to earth pressure estimation*, Finite Elements in Analysis and Design, 44:705-714

Conference publications

1. West-Russel, M, Viljoen, C., *Reliability assessment of cold formed steel columns designed using the direct strength method*, IALCCE, Ghent, Belgium, 2018
2. Boshoff, W.P., Viljoen, C., *Reliability based approach for determining the characteristic strength and material factor for macro synthetic fibre reinforced concrete*, International Conference on Advances in Construction Materials and Systems (71st RILEM Week & ICACMS), 2017, Chennai, India
3. Van Nierop, S., Viljoen, C., Lenner, R., *Target reliability of concrete structures governed by serviceability limit state design*, International Probabilistic Workshop (IPW), Dresden, Germany, 2017
4. McLeod, C.M., Viljoen, C., Retief, J.V., *Determining model uncertainty associated with concrete crack models for members in flexure*, International Probabilistic Workshop (IPW), Dresden, Germany, 2017
5. McLeod, C.M., Viljoen, C., Retief, J.V., *Determining model uncertainty associated with concrete crack models for members in tension*, International Probabilistic Workshop (IPW), Dresden, Germany, 2017
6. Retief, J.V., Holicky, M., Viljoen, C., *International practice and standardisation of the basis of structural design*, The 12th International Conference on Structural Safety and Reliability (ICOSSAR), Vienna, 2017
7. Olalusi, O.B., Viljoen, C., *Towards effective general probabilistic model representation for shear resistance*, The 12th International Conference on Structural Safety and Reliability (ICOSSAR), Vienna, 2017
8. Botha, J, Retief, J.V., Viljoen, C., *Hierarchical Bayesian wind load models for reliability assessment and calibration of standards*, The 12th International Conference on Structural Safety and Reliability (ICOSSAR), Vienna, 2017
9. Sykora, M., Holicky, M., Rozsas, A., Viljoen, C., Retief, J.V., Diamantidis, D., *Risk Based Design of Infrastructures under Extreme Actions due to Environmental Change*, Symposium of the International Association for Life-Cycle Civil Engineering (IALCCE), Delft, 2016, p1366-1373
10. Lenner, R., Viljoen, C., *Traffic Loading in South Africa – Remedial action*, fib Symposium, Cape Town, 2016
11. Viljoen, C., Retief, J.V., Sykora, M., *Reliability Assessment of fib Model Code Shear Resistance for Reinforced Sections*, fib Symposium, Cape Town, 2016
12. Reynolds, S., Viljoen, C., *Evaluation of life safety criteria for South African dams*, Symposium of the International Committee on Large Dams (ICOLD), Johannesburg, 2016
13. Holicky, M., Retief, J.V., Viljoen, C., *Partial Factors for Wind Actions Considering Hidden Safety due to Time Invariant Components*, SEMC: The 6th International Conference on Structural Engineering, Mechanics and Computation, Cape Town, 2016
14. Botha, J., Retief, J.V., Viljoen, C., *Application of Monte Carlo simulation for the reliability treatment of variables with multiple sources of uncertainty*, SEMC: The 6th International Conference on Structural Engineering, Mechanics and Computation, Cape Town, 2016
15. Van der Klashorst, E., Viljoen, C., Retief, J.V., *Reliability based design for vibration control of light steel floor structures*, SEMC: The 6th International Conference on Structural Engineering, Mechanics and Computation, Cape Town, 2016
16. McLeod, C.H., Viljoen, C., Retief, J.V., *Quantification of model uncertainty of EN1992 crack width prediction model*, SEMC: The 6th International Conference on Structural Engineering, Mechanics and Computation, Cape Town, 2016

17. Viljoen, C., Reynolds, S., *Evaluation of decisions to rehabilitate South African dams in terms of the ANCOLD ALARP criterion and SWTP for human safety*, The 12th International Conference on Applications of Statistics and Probability in Civil Engineering (ICASP12), Vancouver, 2015
18. Viljoen, C., Reynolds, S., *Economic optimization considerations in South African dam rehabilitations*, The 12th International Conference on Applications of Statistics and Probability in Civil Engineering (ICASP12), Vancouver, 2015
19. Botha, J., Retief, J.V., Viljoen, C., *Variability of time independent wind load components*, The 12th International Conference on Applications of Statistics and Probability in Civil Engineering (ICASP12), Vancouver, 2015
20. Holicky, M., Retief, J.V., Diamantidis, D., Viljoen, C., *On Standardization of the Reliability Basis of Structural Design*, The 12th International Conference on Applications of Statistics and Probability in Civil Engineering (ICASP12), Vancouver, 2015
21. Retief, J.V., Diamantidis, D., Viljoen, C., Van der Klashorst, E., *Application of Risk Based Infrastructure Design Concepts to provision for climate change*, American Meteorological Society annual conference, Atlanta, 2014
22. Jacobs, H.E., Viljoen, C., De Villiers, W., *A review of Stellenbosch University Civil Engineering Department's first flexible assessment cohort in 2012*, The 7th Annual Conference on the Scholarship of Teaching and Learning, Stellenbosch, 2014
23. Van Wyk, R., Viljoen, C., *Reliability of thin-walled single screwed connections in cold-formed steel against tilt-and-bearing failure*, IPW12: The 12th International Probabilistic Workshop, Weimar, 2014
24. Walls, R., Viljoen, C., De Clercq, H., Retief, J.V., *A Critical Review on Current and Proposed Structural Fire Engineering Codes for Steelwork in South Africa*, ICCMATS, Johannesburg, 2014,
25. Botha, J., Retief, J.V., Holicky, M., Viljoen, C., *Development of probabilistic wind load model for South Africa*, 13th Conference of the Italian Association for Wind Engineering, Geneva, 2014
26. Wium, J.A., Retief, J.V., Viljoen, C., *Lessons from development of design standards in South Africa*, 37th IABSE Symposium, Madrid, 2014
27. Smit, C., Barnardo-Viljoen, C.: *Reliability based optimisation of concrete structural components*, IPW11: The 11th International Probabilistic Workshop, Brno, 2013
28. Retief, J.V., Barnardo-Viljoen, C., Holicky, M.: *Probabilistic models for design of structures against wind loads*, SEMC: The 5th International Conference on Structural Engineering, Mechanics and Computation, Cape Town 2013
29. Holicky, M., Sykora, M., Barnardo-Viljoen, C., Mensah, K.K., Retief, J.V.: *Model uncertainties in reliability analysis of reinforced concrete structures*, SEMC: The 5th International Conference on Structural Engineering, Mechanics and Computation, Cape Town 2013
30. Mensah, K.K., Barnardo-Viljoen, C., Retief, J.V.: *A comparison of the variable strut inclination and alternative stirrup design methods*, SEMC: The 5th International Conference on Structural Engineering, Mechanics and Computation, Cape Town 2013
31. Mensah, K.K., Retief, J.V., Barnardo-Viljoen, C.: *Reliability based application of Eurocode 2's Variable Strut Inclination Method for shear*, ICOSSAR: The 11th International Conference on Structural Safety and Reliability, New York, 2013
32. Barnardo-Viljoen, C., Van der Klashorst, E., Retief, J.V., Diamantidis, D.: *Extreme actions and climate change: Experience gained in South Africa and Germany*, ICOSSAR: The 11th International Conference on Structural Safety and Reliability, New York, 2013
33. Mensah, K.K., Retief, J.V., Barnardo-Viljoen, C.: *Eurocode 2's variable strut inclination method for shear, its modelling uncertainty, and reliability calibration*, fib symposium, Tel Aviv, 2013

34. Mensah, K.K., Retief, J.V., Barnardo-Viljoen, C.: *Review of the reliability basis of structural design and its application to structural concrete in South Africa*, ACCTA: , Johannesburg, 2013
35. Fischer, K., Barnardo, C., Faber, M.H.: *Deriving target reliabilities from the LQI*, LQI symposium, Kgs. Lyngby, Denmark, 2012
36. Retief, J.V., Barnardo, C., Dithinde, M.: *Reliability basis for adopting Eurocodes as South African standards*, The 11th International Conference on Applications of Statistics and Probability in Civil Engineering, Zurich, Switzerland, 2011
37. Dunaiski, P.E., Retief, J.V., Barnardo, C.: *Harmonization of South African Standards for Structural Design to International Practice*, The 9th Pacific Structural Steel Conference, Beijing, China, October 19-22, 2010.
38. Mensah, K.K., Retief, J.V., Barnardo, C.: *Structural Reliability and the Basis of Design for Concrete Structures*. SEMC: The 4th International Conference on Structural Engineering, Mechanics and Computation, Cape Town 2010.
39. Maincon, P., Barnardo, C., Larson, C.M.: *VIV Force Estimation using Inverse FEM*, International Conference on Offshore Mechanics and Arctic Engineering, Estoril, Portugal, June 15-20, 2008, OMAE2008-57325
40. Barnardo, C., Maincon, P.: *Inverse FEM – IV: Influence of modelling error*. SEMC The 2nd International Conference on Structural Engineering, Mechanics and Computation, Cape Town 2004.

Technical reports

1. Viljoen, C., *Provisions for the control of load- and restraint induced cracking for SANS 10100-3: Assessment and recommendation*, Project K5/2514/1: Developing practical documents to aid design and construction of liquid retaining structures and making research provision for the next revision of SANS 10100-3, Water Research Commission, February 2019
2. Viljoen, C., *Seminars on the design and construction of liquid retaining structures*, Project K5/2514/1: Developing practical documents to aid design and construction of liquid retaining structures and making research provision for the next revision of SANS 10100-3, Water Research Commission, April 2018
3. Viljoen, C., Retief, J.V., *A guide to tender specifications for liquid retaining structures*, Project K5/2514/1: Developing practical documents to aid design and construction of liquid retaining structures and making research provision for the next revision of SANS 10100-3, Water Research Commission, August 2017
4. Viljoen, C., Bosman, H., Bultman, K., Dubber, T., Erasmus, D., Kruger, N., Smith, W., *Construction guidelines for liquid retaining structures*, Project K5/2514/1: Developing practical documents to aid design and construction of liquid retaining structures and making research provision for the next revision of SANS 10100-3, Water Research Commission, June 2017
5. Viljoen, C., Retief, J.V., *Design guidance on T_1 and T_2 for South African conditions and concretes*, Project K5/2514/1: Developing practical documents to aid design and construction of liquid retaining structures and making research provision for the next revision of SANS 10100-3, Water Research Commission, February 2017
6. Viljoen, C., *Compilation of a South African National Standard for the design of Liquid Retaining Structures – Volume I: Compilation of SANS 10100-3*, Water Research Commission, Report No.2154/1/15, **ISBN 978-1-4312-0668-1**, April 2015
7. Viljoen, C., Retief, J.V., McLeod, C., Wium, J.A., Mensah, K.K., *Compilation of a South African National Standard for the design of Liquid Retaining Structures – Volume II: Background to SANS 10100-3*, Water Research Commission, Report No.2154/2/15, **ISBN 978-1-4312-0699-8**, April 2015

8. Viljoen, C., WRC K5/2154/1: *The implementation of a South African National Standard for the design of water retaining structures – Background to SANS 10100-3*, Institute of Structural Engineering, University of Stellenbosch, March 2015
9. Viljoen, C., WRC K5/2154/1: *The implementation of a South African National Standard for the design of water retaining structures – SANS 10100-3 voted SABS TC 98/02 committee draft*, Institute of Structural Engineering, University of Stellenbosch, September 2014
10. Viljoen, C., WRC K5/2154/1: *The implementation of a South African National Standard for the design of water retaining structures – Dissemination seminars*, Institute of Structural Engineering, University of Stellenbosch, May 2014
11. Viljoen, C., WRC K5/2154/1: *The implementation of a South African National Standard for the design of water retaining structures – Submission of WG Draft Standard to SABS TC 98/02*, Institute of Structural Engineering, University of Stellenbosch, March 2014
12. Viljoen, C., WRC K5/2154/1: *The implementation of a South African National Standard for the design of water retaining structures – Definition of scope for SANS 10100-3 Working Group*, Institute of Structural Engineering, University of Stellenbosch, December 2013
13. Viljoen, C., WRC K5/2154/1: *The implementation of a South African National Standard for the design of water retaining structures – Registration of SANS 10100-3 Working Group*, Institute of Structural Engineering, University of Stellenbosch, October 2012
14. Viljoen, C., WRC K5/2154/1: *The implementation of a South African National Standard for the design of water retaining structures – Pre-working group workshop*, Institute of Structural Engineering, University of Stellenbosch, August 2012
15. Retief, J.V., Wium, J.A., Viljoen, C., Mensah, K.K., WRC K5/2154/1: *The implementation of a South African National Standard for the design of water retaining structures – Background to SANS 10100-3*, Institute of Structural Engineering, University of Stellenbosch, August 2012
16. Retief, J.V., Wium, J.A., Viljoen, C., Mensah, K.K., WRC K5/2154/1: *The implementation of a South African National Standard for the design of water retaining structures – Guidelines for the Working Group*, Institute of Structural Engineering, University of Stellenbosch, June 2012
17. Paige-Green, P., Lea, J., Barnardo, C. *The relationship between in situ DCP strength and soaked CBR*. Pretoria; CSIR Transportek, Technical Report TR-99/003, 1999.

POST-GRADUATE STUDENT SUPERVISION

DEng students

Graduated:

1. Retief, J.V., *Contributions to the implementation of the principles of reliability to the standardised basis of structural design*, promotors Prof GPAG van Zijl & Dr C Viljoen, December 2015
2. Goliger, A., *Wind engineering science and its role in optimising the design of the built environment*, promotors Prof J.V. Retief & Dr C Viljoen, March 2016

PhD students

Graduated:

3. McLeod, M. *Calibration of a South African serviceability crack width prediction model for use in the design of water retaining structures*, study leader Prof C Viljoen, March 2019.
4. Olalusi, O.B. *Reliability assessment and calibration of VSIM shear design*, study leader Prof C Viljoen, December 2018
5. De Koker, N. *Reliability based design in geotechnical engineering*, study leaders Profs P Day & C Viljoen, December 2018
6. Botha, J. *Probabilistic modelling of the design wind load for South Africa*, study leaders Dr C Viljoen & Prof J.V. Retief, December 2016.
7. Walls, R. *A beam finite element for the analysis of structures in fire*, study leaders Dr C Viljoen & Dr H De Clercq, December 2016.
8. Mensah, K.K., *Reliability Assessment of structural concrete with special reference to stirrup design*, study leaders Dr C Viljoen & Prof J.V. Retief, March 2015
9. Cloete, G.C., *Risk based dam safety in Namibia: a quantitative approach*, study leaders Prof G Basson, Prof J.V. Retief & Dr C Viljoen, March 2015

Registered:

10. Way, A. *Assessment of reliability- and economic implications of adopting EN1992-1-1 crack width provisions in SANS 10100-3*. Study leader Prof C Viljoen, graduation expected March 2021.
11. Bakker, F., *Characterisation of the extreme wind environment in South Africa and its impact on the wind load standard*. Study leader Prof C Viljoen, graduation expected December 2020.

MEng [Research] students

Graduated:

1. Van Nierop, S., *Target reliability for structures governed by SLS design considerations, with special reference to concrete liquid retaining structures*. March 2018. Study leaders Prof C Viljoen & Dr R Lenner,
2. West-Russell, M., *Reliability assessment of cold formed steel columns designed according to SANS 10160 and SANS 10162*. December 2017. Study leaders Prof C Viljoen & Mr E van der Klashorst.
3. Bauer, A., *Reliability assessment of cold formed steel columns designed using the direct strength method*, March 2016. Study leaders Dr C Viljoen & Mr E van der Klashorst.
4. Stolk, W., *Investigation of the implicit reliability of optimal portal frames, including serviceability considerations*, December 2015. Study leaders Mr E van der Klashorst & Dr C Viljoen.
5. Van Wyk, R., *Reliability of cold-formed steel connections and tilt-and-bearing*, December 2014. Study leader Dr C Viljoen.

6. Smit, C., *Reliability Based Optimization of Concrete Structural Components*, March 2014. Study leader Dr C Viljoen.
7. Reynolds, S., *Evaluating the decision criteria for the prioritisation of South African dams for rehabilitation in terms of risk to human lives*, March 2013. Study leader Dr C Viljoen.
8. Schoeman, S., *Identifying trends and relationships between key performance indicators to aid municipal management and decision making*, December 2012. Study leader Dr C Viljoen.
9. Oosthuizen, T., *Probabilistic based calibration between SANS 10160 and 10162:2*, 2011. Study leader Dr C Viljoen.

Registered:

10. Featherstone, N. *Simplified design provisions for integral bridges*. Study leaders Prof C Viljoen & Dr R Lenner,

Upgraded to PhD:

11. Mensah, KK., *Structural reliability and basis of design for concrete structures*. Upgraded to PhD, 2012.
12. Botha, J. *Establishment of the strong-wind design characteristics for South Africa in terms of wind engineering and reliability principles as input to SANS 10160*. Upgraded to PhD, 2014
13. Bakker, F., *Probabilistic assessment of South African extreme wind speed, including assessment of spatial correlation*. Upgraded to PhD, 2019

SUBJECTS LECTURED

Subject	Description
SO454 Advanced Structural Design 2016	Undergraduate semester course for Final year students Contact time: 8hrs per week.
SO354 Structural Design 2012, 2013, 2014, 2016, 2017, 2018	Undergraduate semester course for Third year students Contact time: 3 Lectures & 2.5hr Tutorial per week.
Construction Risk Management 2011, 2012, 2013, 2014, 2015, 2016	Postgraduate block course for postgraduate students, Part II Contact time: 6hrs
MT02 Probability and Risk Analysis in Civil Engineering 2010, 2011, 2012, 2014, 2016, 2018	Postgraduate semester/block course for postgraduate students Contact time: 65hrs
SL143 Strength of Materials 2009, 2010, 2011	Undergraduate semester course for First year students Contact time: 4 Lectures & 3hr Tutorial per week.
MT04 Continuum Mechanics and Finite Element Analysis 2007, 2008, 2009, 2010	Postgraduate semester course for postgraduate students Contact time: 4 Lectures per week

INDUSTRY COURSES PRESENTED

Course name
Advanced seminar on the design of concrete liquid retaining structures – 2013, 2018 Wind loads on Structures: A practical seminar on the provisions of SANS10160-3 – 2014, 2016 Assessment of Existing Structures – 2014 SANS 10160-1 Basis of design – 2013 CSSA Confrex – 2012 ECRI Advanced Course in Construction Risk Management 2011, 2012 and 2014 Induction seminar: SANS 10160 Loading Code – 2011

DESIGN EXPERIENCE / PROJECTS

Project	Description	Responsibilities
Bridge: Bottelary Road over Kuilsriver, Brackenfell (2008/2009)	A 63m long, three span Bridge Post-tensioned continuous voided deck on pot bearings Piled foundations, column piers and spill-through abutments R 12.0 million	Preliminary design Cost estimation Approvals (PAWC) Tender documentation Detail design Manage design team and liaise with client Specialist site supervision
Bridge: Bottelary Road over R300 Highway, Brackenfell (2008/2009)	A 65m long, four span bridge Post-tensioned beams with in-situ slab composite deck Piled foundations, column-and-beam type piers and spill-through abutments R 14.0 million	Preliminary design Cost estimation Approvals (PAWC, SANRAL) Tender documentation Detail design Specialist site supervision
Bridge: Rail over Road Bridge, Croydon (2007/2008)	Access road underpass to Kelderhof residential development, Croyden Requirement of uninterrupted rail traffic a major challenge for constructability A single span voided reinforced concrete deck, jacked into place on pre-cast abutment beams Piled foundations GeoNail soil stabilization Extensive gabion retaining walls R 10.0 million	Preliminary design Cost estimation Approvals (MetroRail and CPT) Tender documentation Detail design Specialist site supervision
Bridge: Road over Road and Rail Bridge, Brackenfell Boulevard, Brackenfell (2006)	A 86m long, six span road-over-road-and-rail bridge Pre- and post-tensioned beams with in-situ slab composite deck Piled foundations, column-and-beam type piers and wall-type abutments R 10.0 million.	Approvals (Spoornet and CPT) Detail design Full site supervision
Bridge: Kransbrug Rehabilitation (2007)	Rehabilitation of steel bridge and concrete support structures	Tender evaluation and report.
Building: Admin Block, Othello Retirement Village, Brackenfell (2007)	Three storey admin block with care unit Problematic founding conditions on former dump site Strip and pad foundations Structural brickwork Concrete beams and columns where necessary Composite slabs – Dismar System	Feasibility study for foundation alternatives Fee proposal Preliminary design Cost estimation Detail design Specialist site supervision
Building: Greenwood Mansion, Gordonsbay (2007)	Three storey luxury apartment in Gordonsbay Concrete frame structure	Design and detail concrete beams, slabs and columns
Analysis & Report: Duferco Anti-Roll Blocks (2007)	Anti-Roll Blocks used to support heavy steel coil stacks in Steel Processing Factory Duferco, Saldanha	Finite Element Analyses. Report and Recommendations.
Analysis: Telecom Mast, Gobabis (2007)	Cable stayed 230m high Steel truss system	Finite Element Analyses.
Research & Documentation: NewWall panel system (2007)	Testing & rational design of NewWall panel system for low cost housing, to obtain Agrément certification and NHBRC approval	Oversee experimental testing of panels, rational design and documentation.

CONTINUED PROFESSIONAL DEVELOPMENT

- 2018: JCSS Advanced School – Structural reliability (Joint Committee of Structural Safety)
- 2018: Seminar: Design and construction of liquid retaining structures (University of Stellenbosch)
- 2017: Conference: ICOSSAR: 12th International conference on structural safety and reliability, Vienna, Austria
- 2017: Seminar: Design and analysis of steel structures (University of Stellenbosch)
- 2016: Conference: SEMC 2016: The 6th International Conference on Structural Engineering, Mechanics and Computation, Cape Town, South Africa
- 2016: Seminar: Wind loads on Structures (University of Stellenbosch)
- 2015: Seminar: Assessment of existing structures (University of Stellenbosch)
- 2014: Course: Bridge Engineering: Analysis, Design & Construction (University of Cape Town)
- 2014: Course: Structural Design of High-Rise Buildings (University of Cape Town)
- 2014: Seminar: Wind loads on Structures (University of Stellenbosch)
- 2013: Conference: SEMC 2013: The 5th International Conference on Structural Engineering, Mechanics and Computation, Cape Town, South Africa
- 2013: Course: Advanced seminar on the design of water retaining structures (University of Stellenbosch)
- 2013: Course: Reliability basis of structural design – SANS 10160-1
- 2012: Seminar: Concrete for liquid retaining and excluding structures (Concrete Society of SA)
- 2011: Conference: ICASP 2011: The 11th International Conference on Applications of Statistics and Probability in Civil Engineering, Zurich, Switzerland
- 2011: Meeting: The 51th meeting of the Joint Committee for Structural Safety, Paris, France
- 2011: Course: Construction Risk Management, Advanced Course (Engineering Construction Risk Institute)
- 2011: Seminar: SANS 10160: Loading code Induction seminar (University of Stellenbosch)
- 2011: Course: Risk Management (University of Stellenbosch)
- 2010: Conference: PSSC 2010: The 9th Pacific Structural Steel Conference, Beijing, China
- 2010: Conference: SEMC 2010: The 4th International Conference on Structural Engineering, Mechanics and Computation, Cape Town, South Africa
- 2010: Course: Post-graduate supervision (Centre for Higher & Adult Education)
- 2010: Course: Risk Induction Course (Engineering & Construction Risk Institute)
- 2010: Talk: Forensic Structural Engineering Practice in the US (Concrete Society of SA)
- 2010: Conference: Accelerating Infrastructure Delivery in Middle East & Africa (SA[ICE]²)
- 2010: Course: Professional Educational Development for Academics - PREDAC (University of Stellenbosch)
- 2009: International Workshop: JCSS Workshop on Semi-Probabilistic FEM Calculations, Delft, Netherlands
- 2009: Course: Applications of Reliability Analysis for Structural Design (University of Stellenbosch)
- 2008: Course: Business Finance for Built Environment Professionals (SAICE)
- 2008: Course: Prestressed Concrete Design (Cement & Concrete Institute)
- 2008: Course: Vibration Serviceability of Civil Structures (University of Cape Town)
- 2008: Seminar: Occupational health and safety (Comprac Holdings)
- 2007: Course: SEISMIC design of structures (University of Stellenbosch)
- 2007: Course: The application of finite Element Methods in Practice (SAICE)
- 2007: Seminar: Concrete durability (Concrete Society of SA)