CURRICULUM VITAE – Prof Richard Walls [redacted]

Nationality	South African
Current Occupation	Full Professor – Stellenbosch University
E-mail address	rwalls@sun.ac.za
Languages	English (Excellent). Afrikaans. Basic Biblical Greek.
YouTube Channel	https://www.youtube.com/channel/UCUZH8qYZwKToJa6n2T9FhyA
FireSUN Channel	https://www.youtube.com/channel/UCv1bBnE4i6eiuYFBEDO3K1Q

QUALIFICATIONS AND REGISTRATIONS

PhD (Civil Engineering)	Stellenbosch University. 2013-2016.
MSc (Structural) (with distinction):	University of the Witwatersrand. 2009-2010.
G.D.E. (with distinction):	University of the Witwatersrand. 2009-2010.
BSc.Eng (Civil) (with distinction):	University of the Witwatersrand. 2005-2008
Pr. Eng.:	Registered as a professional engineer with ECSA. 2014.
BTh (with distinction):	SA Theological Seminary – Part-time studies. 2006-2013.

SUMMARY

Prof Richard Walls is the head of the fire engineering team at Stellenbosch University, Africa's first research team with a focus on fire engineering and structural fire design. Various fire related topics are currently being investigated, such as the design of steel structures in fire, analysis of structures in fire, forensic fire investigations, 3D printed concrete in fire, material behaviour, multi-storey timber fires and informal settlement fire behaviour. Full-scale fire tests on shacks have been conducted on around seventy homes to understand fire behaviour, spread and how to reduce the impact of such fires. Consulting work has been done for companies developing rational structural fire design systems, ascertaining the fire resistance of products, repairing fire-damaged structures (including high-profile National Key Points), forensic investigations and technical guidance on fire safety specifications. He was part of the team analysing the Knysna fire disaster, sponsored by Santam, and specifically considered why almost 1000 homes were lost in South Africa's largest wildland fire disaster. His research has been covered by multiple newspapers, radio stations and websites. His team has developed Masters and PhD programmes in fire safety engineering. He runs postgraduate courses on structural fire engineering, fire dynamics and fire safety.

His team has published around 100 journal / conference / book chapters / technical papers, including the first technical guideline in the world for fire safety in informal settlements. He has contributed to publications by the World Bank, United Nations and various other organisations. He led the writing of South Africa's first infrastructure report card on fire safety infrastructure. He is an honorary fellow of the SA Institute of Civil Engineering (SAICE), and member of various committees including NFPA Research Foundation, SABS technical codes, SAICE Fire Division and SFPE South Africa. He serves as a reviewer for numerous international journals including Fire Technology, Fire Safety, Fire & Materials, Science & Justice, etc.

AWARDS & AFFILIATIONS

- SFPE (USA) Lucht Award for Contributions to Education - 2025
- SAICE Engineer of the Year - 2024.
- TW Kambule-NSTF Award: Emerging researcher of the year in South Africa in 2020. The national NSTF-South32 Awards are the largest Science, Engineering & Technology & Innovation (SETI) awards in South Africa, known as the 'Science Oscars'.
- Honorary Fellow of the SA Institute of Civil Engineering (SAICE) – 2021
- Excellence in Structural Engineering Education Award – Institution of Structural Engineering, UK – 2021.
- Academic of the year award – Faculty of Engineering, Stellenbosch University – 2019
- Emerging researcher of the year award – Faculty of Engineering, Stellenbosch University – 2017
- Best post-graduate thesis award – Department of Civil Engineering, Stellenbosch University – 2016
- Committee member – National Fire Protection Association (NFPA, USA) Foundation – Research advisory board
- Committee member – SAICE Fire Engineering Division
- Committee members – SABS technical committees for fire standards
- Member of the International Association of Fire Safety Scientists (IAFSS), Society for Fire Protection Engineers (SFPE), SA Institute of Civil Engineering (SAICE), Fire Protection Association of SA (FPASA).

LEGAL, INVESTIGATIONS & DISASTER RESPONSE

Prof Walls regularly consults to industry on a wide variety of topics, including legal disputes and forensic investigations. In the past 5 years approximately R5bn worth of investigational and forensic projects have been completed including functions including acting as an expert witness, carrying out fire spread analysis, event reconstruction, fire modelling, informing public safety and more.

Detailed input was provided, including explosion calculations, on the Johannesburg Bree Street blast in 2023. Technical review and expert input were provided regarding the Beirut Blast, based on investigational work conducted by Kindling and Forensic Architecture. Detailed analyses and extensive technical investigations were conducted following the Johannesburg General Charlotte Maxeke Academic Hospital fire as well as the 2017 Knysna wildfire which destroyed 1000 homes. He completed investigations regarding a long-lasting fire in a 3000t grain silo. A student research project has been completed on the Boksburg Blast, analysing the incident and blast mechanism. A separate project investigated the fire safety of public transport infrastructure following significant numbers of arson attacks, leading to recommendations being providing to the executive leadership of a State Owned Enterprise.

In 2024 he assisted Disaster Management during the collapse of a multi-storey building in George, South Africa. Technical support was provided as a structural engineer to try guide operations and keep teams on site safe during extremely dangerous conditions, with people trapped under thousands of tons of rubble.

PUBLICATIONS & RESEARCH

PhD Thesis – "A beam finite element for the analysis of structures in fire"

An analysis methodology and beam finite element has been developed which allows for the simplified design of structures in fire. This thesis was completed under the supervision of Dr Hennie de Clercq and Prof Celeste Viljoen. Refer to the end of this document for the abstract of this thesis, or to http://scholar.sun.ac.za/handle/10019.1/100331.

Journal Papers (peer-reviewed academic):

[1] A. Elvin, R. Walls, D. Cromberge, Optimising structures using the principle of virtual work, Journal of the South African Institution of Civil Engineering 51 (2009).

[2] R. Walls, A. Elvin, An algorithm for grouping members in a structure, Eng Struct 32 (2010) 1760–1768. https://doi.org/10.1016/j.engstruct.2010.02.027.

[3] R. Walls, A. Elvin, Automated structural design and optimisation, The Structural Engineer 88 (2010) 30–34.

[4] R. Walls, A. Elvin, Mass and stiffness distributions in optimized ungrouped unbraced frames, International Journal of Steel Structures 10 (2010). https://doi.org/10.1007/BF03215833.

[5] R. Walls, A. Elvin, Optimizing Structures Subject to Multiple Deflection Constraints and Load Cases Using the Principle of Virtual Work, Journal of Structural Engineering 136 (2010) 1444–1452. https://doi.org/10.1061/(ASCE)ST.1943-541X.0000246.

[6] R.S. Walls, C. Viljoen, A comparison of technical and practical aspects of Eurocode 3-1-1 and SANS 10162-1 hot-rolled steelwork design codes, Civ Engr S Afr 58 (2016) 16–25. https://doi.org/10.17159/2309-8775/2016/v58n1a2.

[7] R.S. Walls, C. Viljoen, H. de Clercq, G.C. Clifton, Reliability Analysis of the Slab Panel Method (SPM) for the Design of Composite Steel Floors in Severe Fires, Journal of Structural Fire Engineering 8 (2017) 84–103. https://doi.org/10.1108/JSFE-01-2017-0008.

[8] R. Walls, G. Olivier, R. Eksteen, Informal settlement fires in South Africa: Fire engineering overview and full-scale tests on "shacks," Fire Saf J 91 (2017) 997–1006. https://doi.org/10.1016/j.firesaf.2017.03.061.

[9] W.J. van Jaarsveldt, R.S. Walls, E. van der Klashorst, Experimental Testing and Finite Element Modelling of Steel Columns Weakened to Facilitate Building Demolition, International Journal of Steel Structures 18 (2018) 1483–1496. https://doi.org/10.1007/s13296-018-0049-3.

[10] R.S. Walls, C. Viljoen, H. de Clercq, Analysis of Structures in Fire as Simplified Skeletal Frames Using a Customised Beam Finite Element, Fire Technol 54 (2018) 1655–1682. https://doi.org/10.1007/s10694-018-0762-7.

[11] A. Cicione, R.S. Walls, C. Kahanji, Experimental Study of Fire Spread Between Multiple Full Scale Informal Settlement Dwellings, Fire Saf J 105 (2019) 19–27. https://doi.org/10.1016/j.firesaf.2019.02.001.

[12] H. Marx, R. Walls, Thermal behaviour of a novel non-composite cellular beam floor system in fire, Journal of Structural Fire Engineering 10 (2019) 354–372. https://doi.org/10.1108/JSFE-10-2018-0032.

[13] M. Kloos, R.S. Walls, Finite Element Modelling of the Structural Behaviour of a Novel Cellular Beam Non-composite Steel Structure in Fire, International Journal of Steel Structures (2019). https://doi.org/10.1007/s13296-019-00215-5.

[14] R.S. Walls, R. Eksteen, C. Kahanji, A. Cicione, Appraisal of fire safety interventions and strategies for informal settlements in South Africa, Disaster Management & Prevention 28 (2019) 343–358. https://doi.org/10.1108/DPM-10-2018-0350.

[15] R. Walls, C. Viljoen, H. de Clercq, A nonlinear, beam finite element with variable, eccentric neutral axis, Eng Struct 187 (2019) 341–351. https://doi.org/10.1016/j.engstruct.2019.02.056.

[16] C. Kahanji, R.S. Walls, A. Cicione, Fire spread analysis for the 2017 Imizamo Yethu informal settlement conflagration in South Africa, International Journal of Disaster Risk Reduction 39 (2019). https://doi.org/10.1016/j.ijdrr.2019.101146.

[17] R. Walls, C. Viljoen, H. De Clercq, Parametric investigation into the cross-sectional stress-strain behaviour, stiffness and thermal forces of steel, concrete and composite beams exposed to fire, Journal of Structural Fire Engineering 11 (2019) 100–117. https://doi.org/10.1108/JSFE-10-2018-0031.

[18] A. Cicione, M. Beshir, R.S. Walls, D. Rush, Full-Scale Informal Settlement Dwelling Fire Experiments and Development of Numerical Models, Springer US, 2019. https://doi.org/10.1007/s10694-019-00894-w.

[19] Y. Wang, C. Bertrand, M. Beshir, C. Kahanji, R. Walls, D. Rush, Developing an experimental database of burning characteristics of combustible informal dwelling materials based on South African informal settlement investigation, Fire Saf J 111 (2020) 102938. https://doi.org/10.1016/j.firesaf.2019.102938.
[20] N. de Koker, R.S. Walls, A. Cicione, Z.R. Sander, S. Löffel, J.J. Claasen, S.J. Fourie, L. Croukamp, D. Rush, 20 Dwelling Large-Scale Experiment of Fire Spread in Informal Settlements, Fire Technol 56 (2020) 1599–1620. https://doi.org/10.1007/s10694-019-00945-2.
[21] S. Löffel, R. Walls, Development of a full-scale testing methodology for benchmarking fire suppression systems for use in informal settlement dwellings, International Journal of Disaster Risk Reduction 45 (2020) 101451. https://doi.org/10.1016/j.ijdrr.2019.101451.
[22] S.A. Löffel, R.S. Walls, Determination of water application rates required for communities to suppress post-flashover informal settlement fires based on numerical modelling and experimental tests, Fire Mater 44 (2020) 609–623. https://doi.org/10.1002/fam.2825.
[23] S. van der Westhuyzen, R. Walls, N. de Koker, Fire tests of South African cross-laminated timber wall panels: fire ratings, charring rates, and delamination, Journal of the South African Institution of Civil Engineering 62 (2020) 33–41. https://doi.org/10.17159/2309-8775/2020/v62n1a4.
[24] J.F. Volkmann, R.S. Walls, N. de Koker, Implementation of the fire beam element method into OpenSees for the analysis of structures in fire, Advances in Structural Engineering (2020) 1–12. https://doi.org/10.1177/1369433220933451.
[25] D. Rush, G. Bankoff, S.-J. Cooper-Knock, L. Gibson, L. Hirst, S. Jordan, G. Spinardi, J. Twigg, R.S. Walls, Fire risk reduction on the margins of an urbanizing world, Disaster Prevention and Management: An International Journal 29 (2020) 747–760. https://doi.org/10.1108/DPM-06-2020-0191.
[26] A. Cicione, L. Gibson, C. Wade, M. Spearpoint, R. Walls, D. Rush, Towards the Development of a Probabilistic Approach to Informal Settlement Fire Spread Using Ignition Modelling and Spatial Metrics, Fire 3 (2020) 67. https://doi.org/10.3390/fire3040067.
[27] A. Cicione, R.S. Walls, Towards a simplified fire dynamic simulator model to analyse fire spread between multiple informal settlement dwellings based on full-scale experiments, Fire Mater 45 (2021) 720–736. https://doi.org/10.1002/fam.2814.
[28] R.S. Walls, A. Cicione, B. Messerschmidt, K. Almand, Africa: Taking fire safety forwards, Fire Mater 45 (2021) 999–1007. https://doi.org/10.1002/fam.2894.
[29] A. Cicione, J. Kruger, R.S. Walls, G. Van Zijl, An experimental study of the behavior of 3D printed concrete at elevated temperatures, Fire Saf J 120 (2021) 103075. https://doi.org/10.1016/j.firesaf.2020.103075.
[30] N. Flores Quiroz, R. Walls, A. Cicione, Developing a framework for fire investigations in informal settlements, Fire Saf J 120 (2021) 103046. https://doi.org/10.1016/j.firesaf.2020.103046.
[31] A. Cicione, C. Wade, M. Spearpoint, L. Gibson, R. Walls, D. Rush, A preliminary investigation to develop a semi-probabilistic model of informal settlement fire spread using B-RISK, Fire Saf J 120 (2021) 103115. https://doi.org/10.1016/j.firesaf.2020.103115.
[32] A. Cicione, R. Walls, Z. Sander, N. Flores, V. Narayanan, S. Stevens, D. Rush, The Effect of Separation Distance Between Informal Dwellings on Fire Spread Rates Based on Experimental Data and Analytical Equations, Fire Technol 57 (2021) 873–909. https://doi.org/10.1007/s10694-020-01023-8.
[33] N. Flores Quiroz, R. Walls, A. Cicione, M. Smith, Fire incident analysis of a large-scale informal settlement fire based on video imagery, International Journal of Disaster Risk Reduction 55 (2021) 102107. https://doi.org/10.1016/j.ijdrr.2021.102107.
[34] N. Flores Quiroz, R. Walls, A. Cicione, Towards Understanding Fire Causes in Informal Settlements Based on Inhabitant Risk Perception, Fire 4 (2021) 39. https://doi.org/10.3390/fire4030039.
[35] N. Flores Quiroz, R. Walls, A. Cicione, M. Smith, Application of the Framework for Fire Investigations in Informal Settlements to large-scale real fire events – Consideration of fire formation patterns, fire spread rates and home survivability, Fire Saf J 125 (2021). https://doi.org/10.1016/j.firesaf.2021.103435.
[36] S.M. Shuttleworth, N. De Koker, R.S. Walls, Insulation Resistance Time Reference Curves for Specifying Passive Fire Protection for Modular Structures from Shipping Containers, Fire Technol 58 (2022) 133–147. https://doi.org/10.1007/s10694-021-01143-9.
[37] A. Cicione, R. Walls, S. Stevens, Z. Sander, N. Flores, V. Narayanan, D. Rush, An Experimental and Numerical Study on the Effects of Leakages and Ventilation Conditions on Informal Settlement Fire Dynamics, Fire Technol (2021). https://doi.org/10.1007/s10694-021-01136-8.
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[40] J. Claasen, R. Walls, A. Cicione, D. Streicher, Structural behaviour of a novel modular cellular steel beam system at elevated temperatures based on large-scale experimental testing and numerical modelling, J Constr Steel Res 197 (2022) 107512. https://doi.org/10.1016/j.jcsr.2022.107512.
[41] A. Cicione, R. Walls, The effect of shear connectors on the strength, serviceability and dynamic response of composite floors using cold-formed steel beams and concrete in decking, Eng Struct 269 (2022) 114806. https://doi.org/10.1016/j.engstruct.2022.114806.
[42] T. Kiran, N. Anand, M.E. Mathews, A.D. Andrushia, R. Walls, B. Kanagaraj, E. lubloy, Post-fire behaviour and improving the performance of hot rolled open sections subjected to standard fire exposure, Case Studies in Construction Materials 16 (2022) e01021. https://doi.org/10.1016/j.cscm.2022.e01021.
[43] R. Pharoah, P. Zweig, R. Walls, R. Eksteen, Smoke Alarms for Informal Settlements: Monitoring and Challenges from a Large-Scale Community Rollout in Cape Town, South Africa, International Journal of Disaster Risk Science 13 (2022) 936–947. https://doi.org/10.1007/s13753-022-00457-8.
[44] L. Strauss, R. Walls, Modeling of Composite Structures in Fire Using a Coupled Skeletal Frame and Floor System Analysis: Slab Panel Method, Journal of Structural Engineering 149 (2023) 1–13. https://doi.org/10.1061/JSENDH.STENG-11807.
[45] Y.W. Shewalul, N.F. Quiroz, D. Streicher, R. Walls, Fire behavior of hemp blocks: A biomass-based construction material, Journal of Building Engineering 80 (2023) 108147. https://doi.org/10.1016/j.jobe.2023.108147.
[46] L. Smit, A. van Wyk, J. van Wyk, O. Heynes, A. Miller, R. Walls, N. Flores-Quiroz, Developing a multi-disciplinary approach to risk-based mapping (RBM) in an onshore refinery: A case study on optimal gas detector placement, J Loss Prev Process Ind 81 (2023). https://doi.org/10.1016/j.jlp.2022.104965.
[47] A. Oguaka, N. Flores Quiroz, R. Walls, Fire parameters, behaviour, and comparative thermal hazard of food grains based on the cone calorimeter tests, Process Safety and Environmental Protection (2023). https://doi.org/10.1016/j.psep.2023.03.078.
[48] A. Oguaka, N. Flores Quiroz, R. Walls, Comparative pyrolysis characteristics and kinetics of agricultural food grains by thermogravimetric analysis, Process Safety and Environmental Protection 179 (2023) 559–574. https://doi.org/10.1016/j.psep.2023.09.047.
[49] C. Devine, N. Flores, R. Walls, Literature review and hazard identification relating to fire safety in commercial plastic recycling facilities, J Fire Sci 41 (2023) 269–287. https://doi.org/10.1177/07349041231199894.
[50] J. Daniel Oosthuizen, A. John Babafemi, R. Shaun Walls, 3D-printed recycled plastic eco-aggregate (Resin8) concrete, Constr Build Mater 408 (2023) 133712. https://doi.org/10.1016/j.conbuildmat.2023.133712.
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[52] J. Claasen, A. Cicione, D. Streicher, R. Walls, Behavior of a Composite Steel Decking and Boarding System in Fire Based on Large-Scale Experimental Testing and Numerical Modelling, Fire Technol 59 (2023) 2389–2414. https://doi.org/10.1007/s10694-023-01443-2.
[53] N. Flores Quiroz, R. Walls, P. Chamberlain, G. Tan, J. Milke, Incident Report and Analysis of the 2021 Cox's Bazar Rohingya Refugee Camp Fire in Bangladesh, Fire Technol 2 (2023). https://doi.org/10.1007/s10694-023-01406-7.
[54] N. Flores Quiroz, L. Gibson, W.S. Conradie, P. Ryan, R. Heydenrych, A. Moran, A. van Straten, R. Walls, Analysis of the 2017 Knysna fires disaster with emphasis on fire spread, home losses and the influence of vegetation and weather conditions: A South African case study, International Journal of Disaster Risk Reduction 88 (2023). https://doi.org/10.1016/j.ijdrr.2023.103618.
[55] M. du Plessis, D. Sulon, D. Streicher, R. Walls, Experimental testing on timber connections considering the influence of gap size and intumescent sealants, Fire Mater 48 (2024) 39–61. https://doi.org/10.1002/fam.3164.
[56] A. Oguaka, N. Flores-Quiroz, R. Walls, Radiative ignition properties of food grains and surface temperatures at ignition, J Fire Sci 42 (2024) 340–359. https://doi.org/10.1177/07349041231220840.
[57] C. Devine, N. Flores-Quiroz, R. Walls, C. Kuhn, Fire parameters of recycled plastic pellets, Fire Mater 49 (2025) 127–137. https://doi.org/10.1002/FAM.3248.
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[60] N.F. Quiroz, R. Walls, The Influence of COVID-19 Alcohol Ban on Residential Fires in Cape Town, South Africa, International Journal of Fire Science and Engineering 39 (2025) 82–92. https://doi.org/10.7731/KIFSE.FFB9284B.

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[63] Y.W. Shewalul, N. Flores Quiroz, R. Walls, Thermal Analysis and Fire Property Quantification of Crumb Rubber and Plastic Eco-Aggregates for Sustainable Construction, Fire Mater (2024). https://doi.org/10.1002/fam.3259.

Conference Papers (peer-reviewed academic):

[1] R.S. Walls, A.A. Elvin, A search algorithm for optimizing the grouping of members, in: Advances and Trends in Structural Engineering, Mechanics and Computation - Proceedings of the 4th International Conference on Structural Engineering, Mechanics and Computation, SEMC 2010, CRC Press/Balkema, 2010: pp. 1121–1124.
[2] R.S. Walls, A.A. Elvin, The virtual work optimization method applied to structures: An investigation into cellular beams versus trusses, in: Advances and Trends in Structural Engineering, Mechanics and Computation - Proceedings of the 4th International Conference on Structural Engineering, Mechanics and Computation, SEMC 2010, CRC Press/Balkema, 2010: pp. 1113–1116.
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[4] R. Walls, C. Viljoen, H. de Clercq, J. Retief, A critical review on current and proposed structural fire engineering codes for steelwork in South Africa, in: S.O. Ekolu et al (Ed.), Construction Materials & Structures, IOS Press, Johannesburg, 2014: pp. 1134–1140.
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[7] W.J. Van Jaarsveldt, R.S. Walls, Predicting the failure load of steel columns weakened to facilitate demolition of a structure, in: Insights and Innovations in Structural Engineering, Mechanics and Computation - Proceedings of the 6th International Conference on Structural Engineering, Mechanics and Computation, SEMC 2016, CRC Press/Balkema, 2016: pp. 1190–1195.
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[10] L.L. Gibson, D. Rush, O. Wheeler, R. Cairns, R. Walls, Fire detection in informal settlements, in: N. Chrysoulakis, T. Erbertseder, Y. Zhang (Eds.), Remote Sensing Technologies and Applications in Urban Environments III, SPIE, Berlin, 2018: p. 31. https://doi.org/10.1117/12.2501885.
[11] R.S. Walls, A. Cicione, B. Messerschmidt, K. Almand, Africa: The Next Frontier for Fire Safety Engineering?, in: 15th International Conference and Exhibition on Fire Science and Engineering, London, 2019: pp. 819–829.
[12] A. Cicione, R.S. Walls, Towards a Simplified Fire Dynamic Simulator Model to Analyse Fire Spread Between Multiple Informal Settlement Dwellings Based on Full-Scale Experiments, in: Interflam Proceedings, 2019.
[13] A. Cicione, R. Walls, Estimating time to structural collapse of informal settlement dwellings based on structural fire engineering principles, in: A. Zingoni (Ed.), Advances in Engineering Materials, Structures and Systems: Innovations, Mechanics and Applications, CRC Press, 2019: pp. 1909–1914. https://doi.org/10.1201/9780429426506.
[14] T. Dunn, R. Walls, Demolition engineering: Determination of the axial load capacity of steel columns weakened by horizontal and diagonal cuts, in: A. Zingoni (Ed.), Advances in Engineering Materials, Structures and Systems: Innovations, Mechanics and Applications, CRC Press, 2019: pp. 2209–2214. https://doi.org/10.1201/9780429426506.
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[16] J. Kruger, A. Cicione, F. Bester, M. van den Heever, S. Cho, R. Walls, G. van Zijl, Facilitating Ductile Failure of 3D Printed Concrete Elements in Fire, in: F. Bos, S. Lucas, R. Wolfs, T. Salet (Eds.), Second RILEM International Conference on Concrete and Digital Fabrication. DC 2020. Rilem Bookseries 28, Springer, Cham, 2020: pp. 449–458. https://doi.org/10.1007/978-3-030-49916-7_46.
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Books editted:

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Book chapters:

[1] R. Walls, "1. Introduction," in *Fire safety engineering guideline for informal settlements: Towards practical solutions for a complex problem in South Africa*, R. Walls, Ed. Stellenbosch: FireSUN Publications, 2020, pp. 1–8. [Online]. Available: http://hdl.handle.net/10019.1/108926
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Reviewing of technical papers:

Applied Thermal Energy, Case Studies in Thermal Engineering, Construction & Building Materials, Fire & Material, Fire Technology, Fire Safety Journal, International Journal of Disaster Risk Reduction, Journal of Building Engineering, Journal of Structural Fire Engineering, Kindling, SAICE Journal, Science & Justice, Structural Engineering International, Structures, Thermal Science and Engineering Progress, Water, and World Bank.

Researcher & Student Supervision:

Postdoc: Dr Charles Kahanji 2017-2018

Dr Nico de Koker – 2018-2019

Dr Antonio Cicione – 2020-2021

Dr Mohamad Pourbehi – 2020-2021

Dr Natalia Flores-Quiroz – 2021-2023

Dr Miss Hasimawaty Binti Mat Kiah – 2024-present

PhD: Cicione, A – "Fire dynamics in informal settlements" – 2017-2019 [MEng upgrade]

Narayanan, V – "Test methods for evaluating construction materials in informal settlements" – 2019-2022

Flores Quiroz, N – "Forensic investigations in informal settlements" – 2019-2021

Claassen, J – "Full-scale testing of the SAISC cellular beam structure" – 2018-2021

Wiid, F – The effect of additives for foam-water based automatic fire suppression systems in high pile tyre storage – 2020- . Co-supervisor.

Oguaka, AB – Fire behaviour modelling and analysis (to be confirmed) – 2021-2023

Du Plessis, M – Behaviour of passive protection products in timber joints – 2021-2023

Devine, C – Fire safety for plastic recycling facilities – 2021-2024

Sulon, D – Behaviour of timber connections in fire – 2019-2024. Co-supervisor.

Shewalul, Y – Behaviour of construction systems incorporating waste plastic in fire – 2022-2024.

Kakoma, E – Fire safety for developing world trains – 2023-

Van Wyk, R – Sustainable reinforcing systems in fire – 2025-

Fourie, S – Wildland spread modelling for the Western Cape – 2025-

MEng: Van Jaarsveldt, WJ – "Predicting the failure load of columns weakened to facilitate demolition of steel structures" – 2015-2016. Co-supervisor.

Kloos, M – "Structural behaviour of a new cellular steel beam structural system in fire" – 2016-2017

Marx, H – "Thermal behaviour of a new cellular steel beam structural system in fire" – 2016-2017

Volkmann, J – "Modelling of structures in fire using beam elements" – 2017-2018

Loffel, S – "Suppression of fires in informal settlements" – 2018-2019

Fourie, S – "Behaviour of the Voidcon flooring system in fire" – 2018-2019

Gous, M – "Behaviour of South African passenger trains in fire"- 2019-2021

Sander, Z – "Behaviour of recycled bottle EcoBricks structures in fire"- 2019-2021

Strauss, L – "Analysis of 3D structural frames in fire using the fire beam element (FBE)"- 2019-2020

Mnanzana, P – "Fire behaviour of a novel decking system in fire" – 2019-2025 . Co-supervisor.

Botha, A – "Behaviour of recycled construction materials in fire" – 2020-2021 . Co-supervisor.

Oosthuysen, C – "Design of modified steel shipping containers for ambient and elevated temperatures". 2020-2021. Co-supervisor.

Van Biljoen, M – "Modelling and analysis of standard fire testing furnaces". 2020-2021. Co-supervisor.

Whitehead, M – "Comparative analysis of fire test standards applicable to building materials". 2020-2021

Oosthuizen, J – Behaviour of 3D printed concrete incorporating Resin8 – 2021-2022. Co-supervisor.

Pillay, S – Modelling of 3D printed concrete in fire – 2022-2022.

Van Wyk, R – Development of an electronic HTRIS – 2022-2023

Zulu, S – Modelling of composite timber-concrete slabs in fire – 2022-2023

Vermeulen, Z – Development of a biomass intumescent paint – 2023-2024

Liebenberg, A – Fire safety for hospitals – 2023-2024

Kunutu, B – 3DPC fire safety – 2022-2024

Human, M – Testing of SA plywood in fire – 2023-2025

Whithead, M – Expansion strategies for fire safety companies into Africa – 2023-2024

Becker, Y – Fire resistance of passenger train flooring systems – 2024-2025

Pretorius, L – Experimental investigation on thermal runaway in lithium-ion batteries – 2024-2025

Abdalhameed, A – Smoke emissions from sustainable construction materials – 2025-

Du Preez, E – Fire spread modelling for informal settlements – 2025-

Kuhn, C – Development of a controlled atmosphere calorimeter – 2025-

Approximately 4-5 final year (honours) research projects are also supervised each year. The table below summarises details.

	Current at end 2025	Graduated by end 2025	Total
BEng / Honours	0	40	40
Masters	3	25	28
PhD	4	9	13

Lecturing

- AD446 – Under-graduate course: Advanced Design Project
- SD424 – Design of structural steelwork
- BM254 – Building Materials
- Post-graduate course: Advanced Concrete Design
- Post-graduate course: Structural Fire Engineering
- Post-graduate course: Fire behaviour
- Post-graduate course: Fire Engineering 1
- Post-graduate course: Fire Engineering 2
- Post-graduate course: Techniques in Fire Engineering
- Various lectures on advanced geotechnical engineering, steel design and construction management.
- Refer to the YouTube channels listed above for various video lectures produced.

Research Grants and Funding Received From:

1. New Generation of Academic Personnel – Department of Higher Education & Training
2. NRF-DAAD
3. NRF Thuthuka Grant
4. The Ove Arup Foundation
5. Global Challenges Research Fund from the UK in conjunction with the University of Edinburgh.
6. SU Institute of Structural Engineering – Start-up funding
7. Various Stellenbosch University travel and research grants.

8. SA Institute of Steel Construction
9. Lloyd's Register Foundation – "Fire Engineering Education For Africa"
10. THRIP funding under the Department of Trade and Industry
11. Western Cape Government Department of Human Settlements
12. Voidcon Research and Development project under the Department of Trade & Industry
13. Royal Academy of Engineering / Lloyd's Register Foundation – Engineering skills where they are needed most
14. nGAP – New Generation of Academic Personal – Appointment of junior diversity staff member.
15. Structural fire engineering & Fire behaviour course – Run as research funding generating CPD courses.
16. Stellenbosch University Strategic Funding – Establishing MEng(S) in fire safety

Total funding generated: ±R24 million

University accolades – BScEng(Civil)

Wits University Awards: Cement and Concrete Institute Prize, Jere Jennings Prize for Civil Engineering, Jere Jennings Prize in Geotechnical Engineering, Desmond Midgeley Knight-Piesold Prize for Hydrology, Murray and Roberts Prize in Civil Engineering, R Kirkpatrick and Son Award, JSD Structural Engineering Prize, Dean's List, Best Academic Student in the class every year of BSc studies, best research presentation in engineering at the Wits Post-graduate Research Symposium.

CONSULTING EXPERIENCE PRIOR TO ACADEMIA

Employer:	BSM Baker – Civil and structural engineers
Director and mentor:	Geoff Baker (Pr. Eng.)
Period employed:	January 2010 – December 2013: Full-time employment.
	January 2014 – December 2015: Part-time consulting.
Position held:	Structural engineer

During employment at BSM Baker extensive experience has been gained in the design, management, supervision and financial control of industrial, petrochemical and commercial structures. Key areas involved with include: steelwork design; concrete design; composite design; draughting; computer modelling of structures; foundation design; design of liquid retaining structures; design of glass bottle factories, batch houses and associated works; project management; budgeting; tendering; managing staff; financial control and invoicing on projects; site supervision; petrochemical facilities and fire-fighting design. Much time has been spent on construction sites and in existing or new buildings during projects. Recognition as a professional engineer (Pr. Eng.) was obtained in 2014, based on the experience and technical work undertaken.

Selected Consulting Projects

Important projects involved with while at BSM Baker include:

- Consol Nigel Factory – a R1.2bn greenfields glass factory. The batch plant, offloading pit, ancillary services, transfer gantries etc. were designed for this project. A great deal of time was also spent on tendering and then doing site supervision during construction.
- An R80m batch house for Nampak's new glass furnace line. All budgeting and design were personally completed.
- Numerous upgrades at the Consol Clayville, Pretoria, and Wadeville factories
- A R30m rebuild to the Consol Bellville factory
- A R2.5bn crude oil storage facility to be constructed in the Western Cape. All preliminary design, budgeting and management of the project were completed.
- Preliminary design work on a R1.8bn coal handling terminal to be constructed in Richard's Bay
- A R12.5m extension to a factory for Pferd South Africa, with complicated details of tying into 3 existing structures.
- Design of a tower for wind turbines
- Design of a numerous warehouses
- Various other industrial structures including substations, chemical containment vessels, gantries, bunkers etc.

Consol Nigel site during construction

Consol Nigel Batch Plant

Consol Nigel Furnace Building & Warehouse

Consol Nigel Batch Plant on completion

Batch Plant, Johannesburg

Batch Plant, Johannesburg

Storage building, Johannesburg

Pharmaceuticals warehouse, Johannesburg

Pharmaceuticals warehouse, Johannesburg

Manufacturing facility, Johannesburg

Manufacturing facility, Johannesburg

Church - Soweto

Mining processing structures – South America

SCHOOLING AND INTERESTS

School accolades:	Head Boy, Top 50 Matric Student in South Africa for IEB, Top Academic Scholar at De La Salle, prefect, debating captain, representative on the Johannesburg Junior City Council.
Awards:	Exceptional leadership, Outstanding Loyalty, All-Round Proficiency, Top tennis player, Public speaking, Geography, Additional Mathematics and Mathematics.
Sports in school:	Cricket (1st team), tennis (1st Team), athletics, rugby, soccer and cross-country.
Cultural in school:	Debating (captain), public speaking (best speaker), chess and drama.
Cultural outside of school:	Represented South Gauteng for the Inter-provincial Maths Olympiad 2003.
	Finalist of South African Harmony Gold Maths Olympiad.

Current interests:	Teaching Sunday school, running a church home group, reading, mountain biking, running, hiking, theology and the outdoors.

SUMMARY OF EXPERIENCE, WORK & SCHOOLING

July 2020 – Present	Full professor in structural and fire engineering – Stellenbosch University
Jan 2020 – July 2020	Associate professor in structural and fire engineering – Stellenbosch University
July 2017 – Dec 2019	Senior lecturer in structural engineering – Stellenbosch University
Aug 2014 – Jun 2017	Lecturer in structural engineering – Stellenbosch University
Jan 2014 – Dec 2016	PhD (Civil Engineering)
Jan 2010 – Dec 2013	Structural engineer with BSM Baker
Jan 2009 – Dec 2009	Full-time work on a full research MSc and separate GDE (Graduate Diploma in Engineering). Both degrees were completed and awarded in 2010 at Wits University.
Oct 2006 – Aug 2013	BTh (Bachelor in theology). SA Theological Seminary. Part-time, correspondence studies.
Jan 2005 – Dec 2008	BSc.Eng (Civil) (with distinction).
Jan 2004 – Dec 2004	Outdoors activity instructor at Frontier Centre (UK). Travelled through Europe.
Apr 1994 – Dec 2003	De La Salle Holy Cross College Junior / Senior Schools (Johannesburg)
Jan 1991 – Apr 1994	Bergvliet Primary School (Cape Town)