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# STRUCTURAL FIRE ENGINEERING

Event  
sponsorship  
opportunities  
available

A seminar for structural and fire engineers covering the fundamental principles for designing buildings for fire safety

## Johannesburg

Garden Court, OR Tambo Int. Airport  
29-30 July 2019

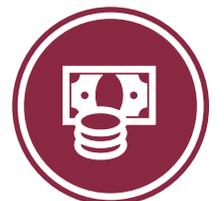
## Cape Town

Lord Charles Hotel, Somerset West  
1-2 August 2019

**2 CPD**  
CREDITS



**R 6800**  
EARLY BIRD



(This CPD course can also be extended and taken as a post-graduate correspondence course.)



## SEMINAR OBJECTIVE

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This course covers the principles of structural design for fire safety. The topics addressed are:

- Fire safety in buildings
- Fires and heat
- Fire severity and resistance
- Design of structures exposed to fire
- Steel structures in fire
- Concrete structures in fire
- Composite structures in fire
- Timber structures in fire
- An introduction to advanced modelling methods

The seminar is designed for structural engineers and fire engineers to expose the industry to how to achieve safer, and economical, structures.

## SEMINAR FOCAL POINTS

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The seminar seek to provide an understanding of factors such as:

- How do real fires behave?
- What is the difference between a standard fire and a real fire?
- What is a 1 hour standard fire rating and how do I achieve it?
- Understanding how structures behave at elevated temperatures
- What is structural failure?
- Understanding how to calculate temperatures and design passive protection for structural members
- Understanding steel, concrete and timber response to fire
- Understanding the limitations of current guidelines or codes of practice
- Highlighting how significant cost savings can be made when structures are well-designed for fire

Engineers, architects and built environment practitioners are regularly designing and constructing buildings which may either be unsafe in the case of a fire, or conversely could be safe but be very uneconomical due to the specifications required for fire safety. It shall be shown that through rational, well-validated, engineering design procedures economical and safe buildings can be delivered.

# SEMINAR PROGRAM

TIME	DAY 1	DAY 2
07:30 - 08:20	Registration & Refreshments	Registration & Refreshments
08:20 - 08:30	Welcome & Introduction	Welcome & Introduction
08:30 – 10:00	<b>Basics of fire safety engineering</b> General fire safety requirements in buildings	<b>Steel structures in fire</b> Calculation of temperatures and material behaviour
	<b>Fires &amp; heat</b> Fire behaviour and heat transfer	<b>Steel structures in fire</b> Design calculations for strength
10:00 -10:30	<b>Coffee/Tea break</b>	<b>Coffee/Tea break</b>
10:30 - 12:30	<b>Fires &amp; heat</b> Fire behaviour and enclosure fire dynamics	<b>Concrete structures in fire</b> Behaviour and material properties
	<b>Fire severity and fire resistance</b> Providing fire resistance and fires tests	<b>Concrete structures in fire</b> Design of concrete members
12:30- 13:15	<b>Lunch</b>	<b>Lunch</b>
13:15 – 15:00	<b>Fire severity and fire resistance</b> Testing and resistance of assemblies	<b>Timber structures in fire</b> Behaviour and material properties
	<b>Design of structures in fire</b> Loads and load combinations	<b>Timber structures in fire</b> Design principles and calculations
15:00 - 15:30	<b>Coffee/Tea break</b>	<b>Coffee/Tea break</b>
15:30 - 17:00	<b>Design of structures in fire</b> Material properties and structural assemblies	<b>Composite steel-concrete structures in fire</b> Behaviour of composite structures
	<b>Steel structures in fire</b> General design and behaviour	<b>Advanced modelling techniques for structures in fire</b> Introduction to the modelling of buildings in fire
	Closure   Discussion   Q&A	Closure   Discussion   Q&A

# PRESENTERS



## 1. Prof Erica Fischer

Erica Fischer (PhD, BSCE, PE) is an Assistant Professor of Civil and Construction Engineering at Oregon State University. Dr Fischer's research interests revolve around innovative approaches to improve the resilience and robustness of structural systems affected by natural and man-made hazards.

Dr Fischer performs research on a variety of different structural systems including steel, timber (CLT), composites (concrete-CLT and steel-concrete), and thin shells subjected to hazards such as earthquakes and fires. She has led a team of multi-disciplinary scientists in post-wildfire reconnaissance in Paradise, California.

Dr Fischer sits on the Board of Directors of the Earthquake Engineering Research Institute, and is an active member of the American Society of Civil Engineers (ASCE) Fire Protection Committee. She was a large contributor to the ASCE Manual of Practice on Structural Fire Engineering. Dr Fischer has experience as a practicing structural engineer and holds a Professional Engineering license in the states of Washington, California, and Oregon.

## 2. Dr Richard Walls

Richard Walls (PhD, MSc, GDE, BScEng, BTh, PrEng) is the head of the Fire Engineering Research Unit at Stellenbosch University (FireSUN). He worked as a professional structural engineer designing industrial, petrochemical and commercial buildings before joining Stellenbosch University as a lecturer and researcher.

His areas of research include structural fire design, informal settlement fire safety, timber in fire (CLT), full-scale fire testing, modelling, demolition engineering, structural steel and burning things down Myth Buster style (has destroyed more than 50 full-scale homes). He works closely with local fire services developing solutions for informal settlement fire problems, and was involved in an analysis of the homes that burnt down in the 2017 Knysna Fire disaster.

Dr Walls lectures on the design of steel and concrete structures, structural fire design and supervises various masters and PhD students. He has published journal and conference papers on various topics, and consults to industry on specialist fire engineer projects.

In 2019 the FireSUN team launched masters and PhD degree programs in fire safety engineering.

## 3. Dr Nico de Koker

Nico de Koker (PhD, PhD, BScEng, BSc) is a computational physicist and structural engineer, currently working as a research fellow in the Structural Engineering Division at Stellenbosch University.

Following many years specializing in thermodynamics and heat transfer in materials at extreme conditions, Dr de Koker changed his focus to structural engineering, completing a second PhD in reliability based design through Stellenbosch University.

His research interests broadly focus on the analysis of risk and reliability in engineering, in particular structural fire safety, fire spread modeling, reliability-based design, and infrastructure maintenance. He also does consulting work in risk-related engineering problems such as structural fire safety and reliability analysis. He led the world's largest informal settlement fire experiment and assists in the supervision of various students in the FireSUN team.

# CPD CREDITS

The seminar is accredited for 2 Continued Professional Development credits with ECSA.



# REGISTRATION

Please register online by clicking on the link below:

Johannesburg: <https://shortcourses.sun.ac.za/application-form.html?offeringid=6d6bb3ec-9e56-e911-941e-0050568000ff>

Cape Town: <https://shortcourses.sun.ac.za/application-form.html?offeringid=f375edaf-665b-e911-80e3-0050568033a6>



Our system will generate an email with payment details.

# PAYMENT



**Early Bird: R 6800**

**Payment must be received by 7 June**

**Normal Bird: R 7500**

**Payment must be received 5 days before the seminar**

## PAYMENT INSTRUCTIONS

After online registration for a course you will receive an automated email with payment details. Invoices to companies will be created after successful online registration.

## PLEASE EMAIL PROOF OF PAYMENT TO: Ms. Tsholofelo Seroalo

Stellenbosch University, Department of Civil Engineering  
Email: [civilcourses@sun.ac.za](mailto:civilcourses@sun.ac.za)  
Enquiries: 021 808 4131

## EVENT SPONSORSHIP OPPORTUNITIES:

Please contact [civilcourses@sun.ac.za](mailto:civilcourses@sun.ac.za) for options.

## POST GRADUATE COURSE OPTION

This course is also offered as a 15 credit NQF Level 8 (postgraduate diploma) & Level 9 (masters) course, with lectures and content presented online, in addition to the CPD course. Assignments and an exam must be completed for this course. University admission requirements apply. For more information contact: [civilcourses@sun.ac.za](mailto:civilcourses@sun.ac.za)