Supported by:

One-day Technical Workshop

Concrete Technology for Structural Engineers

University of Cape Town, Dept. of Civil Engineering

The workshop attracts 1 CPD Point

Cape Town (University of Cape Town):	**Tuesday, 11 May 2010, 07:30 – 17:00**
Durban (Westville Hotel):	**Tuesday, 25 May 2010, 07:30 – 17:00**
Midrand (Protea Hotel Midrand):	**Wednesday, 26 May 2010, 07:30 – 17:00**
East London (Blue Lagoon Hotel):	**Tuesday, 26 Oct. 2010, 07:30 – 17:00**
Port Elizabeth (Cherry Place Conference Centre):	**Wednesday, 27 Oct. 2010, 07:30 – 17:00**

Contact

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Presenters

Professor M.G. Alexander, Dr. H. Beushausen, University of Cape Town

Background and purpose of the seminar

Structural engineers are required to make reasonable assumptions and provide economical solutions for the design of reinforced concrete structures. An important part of this process is the choice of appropriate concrete material properties and the relevant specification of mix constituents, mix proportions and construction methods.
Modern design methods usually involve the use of software packages in which predefined values for relevant concrete properties, such as strength and deformation characteristics, are made. Accepting such predefined assumptions without accounting for specific project requirements, and site conditions may result in conservative and uneconomic design of reinforced concrete structures. In addition, innovative and modern types of concrete are often not considered in the design process as many structural engineers have limited knowledge of fundamental concrete materials technology.

The workshop will refresh the structural engineer's knowledge and understanding of concrete properties to enable him/her to rationally specify economic design solutions for reinforced concrete structures. Based on fundamental concrete materials technology, the workshop will discuss design procedures and constituent material choices for general and specific structural requirements. Important properties such as strength and strength development, elastic deformations, shrinkage and creep, and durability will be discussed. The presentations cover fundamental materials aspects, design methods, test procedures and prediction models for concrete properties. Comparisons between code provisions presented in SABS 0100 and the new Eurocode are drawn to highlight alternative design solutions.

The underlying aims of the workshop are to highlight the importance of materials in structural design and to facilitate a good understanding of fundamental and modern concrete technology in order to promote economic and sustainable design of reinforced concrete structures.

Layout and contents

The workshop runs over one day and includes lectures and discussions on selected topics as listed below. References for in-depth self study on particular aspects of the seminar will be provided.

- Critical review of common design assumptions and code provisions (SABS and EN)
- Critical review of concrete material properties suggested in common structural design software
- Cement types and hydration process (principles, property development, hydration heat), highlighting how to influence hydration and property development through the choice of constituent materials and mix parameters
- Modern admixtures for concrete: types, applications, and limitations
- Compressive strength of concrete (design assumptions, strength classes, influencing factors, prediction models)
- Tensile and flexural strength (common values, relationship between compressive and tensile strength, significance in design, test methods)
- Concrete behaviour under load (deformation principles, failure and fracture)
- Elastic properties (importance and relevance, design assumptions and prediction models, test methods, material influences)
- Shrinkage and creep (importance in design, structural effects, design assumptions and prediction models, test methods and their limitations, material influences)
- Special requirements for concrete (early age properties, workability, strength development, heat of hydration)
- Concrete durability (overview on deterioration mechanisms, design for durability, material choice, prediction models and test methods)
- Overview on special concretes (self compacting concrete, high strength concrete)

Participant target groups

- **Structural engineers** involved in the design of reinforced concrete members and structures
- **Practitioners and site staff** involved in the construction of reinforced concrete members and structures
- **Agency and public sector engineers** responsible for reinforced concrete projects
- **Students and academics**

Programme and Timetable

07:30 - 08:30	Registration
08:30 - 09:30	Introduction; Different types of cements, hydration and early age property development of concrete; Concrete admixtures
09:30- 10:30	Compressive strength of concrete; Tensile and flexural strength
10:30 - 11:00	Tea break
11:00 - 12:00	Behaviour under load; Deformation principles; Elastic properties
12:00 - 13:00	Shrinkage and creep
13:00 - 14:00	Lunch break
14:00 - 14:30	Concrete deterioration mechanisms
14:30 - 15:00	Concrete durability
15:00 - 15:30	Tea break
15:30 - 16:00	Special concretes: SCC, HSC
16:00 - 16:30	Sponsors presentations on concrete technology
16:30	Discussion and closure

Literature and Handouts

Printed material and handouts will be provided.

Registration fees

	Registration before 01.04.10	*Registration after 31.03.10*
Delegates	R 2100	R 2500
Full-time students	R 400	R 600

Registration covers attendance of all sessions of the workshop, teas and lunch, and one set of printed notes.

Registration form

One-day Technical Seminar

Concrete Technology for Structural Engineers

Venue (*please tick*) **Midrand** ☐ **Cape Town** ☐ **Durban** ☐ **East London** ☐ **Port Elizabeth** ☐

Fees (*please tick as appropriate*)

	Registration before 01.04.10	*Registration after 31.03.10*
Delegates	R 2100	R 2500
Full-time students	R 400	R 600

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