# THE TECHNICAL UNIVERSITY OF KENYA

Haile Selassie Avenue, P.O. Box 52428, Nairobi, 00200, Tel +254(020) 343672, 2249974, 2251300, 341639

Fax 2219689, Email: vc@tukenya.ac.ke, Website: www.tukenya.ac.ke

NAME: PROF DAVID OTIENO KOTENG'

| | |
|---|---|
| Faculty: | ENGINEERING AND THE BUILT ENVIRONMENT |
| School: | CIVIL AND RESOURCE ENGINEERING |
| Department: | STRUCTURAL AND CONSTRUCTION ENGINEERING |
| Current Designation: | Associate Professor, STRUCTURAL AND CONSTRUCTION ENGINEERING (DSCE) |
| Office Telephone: | +254(020) 2219929, 3341639, 3343672 |
| Official Email: | david.koteng@tukenya.ac.ke |
| Consultation Hours: | 8AM-5PM MON - FRI |

## EDUCATION

| LEVEL | QUALIFICATION NAME | INSTITUTION | YEAR |
|---|---|---|---|
| Doctor of Philosophy (PhD) | CONSTRUCTION MATERIALS | NATIONAL TAIWAN UNIVERSITY OF SCIENCE AND TECHNOLOGY(Taiwan) | 2015 |
| Master of Engineering (M.Eng) | SCIENCE | UNIVERSITY OF MELBOURNE(Australia) | 1984 |
| Bachelor of Science in Engineering(B.Sc. Eng) | CIVIL | UNIVERSITY OF NAIROBI(Kenya) | 1977 |
| Short Course/ Training | MIDAS GEN OFTWARE | UNIVERSITY OF NAIROBI(Kenya) | 2016 |
| Short Course/ Training | ADVANCED CONCRETE DURABILITY | WEBCORR CORROSION CONSULTING SERVICES(Kenya) | 2009 |
| Short Course/ Training | ASIESMIC DESIGN AND CONSTRUCTION OF BUILDINGS | INSTITUTE OF EARTHQUAKE ENGINEERING(Macedonia) | 1988 |

## WORK EXPERIENCE

| PERIOD | INSTITUTION | POSITION |
|---|---|---|
| 01/03/2017 - TO DATE | THE TECHNICAL UNIVERSITY OF KENYA | ASSOCIATE PROFESSOR |
| July 1977 - July 1989 | Ministry of Public Works | Superintending Engineer |
| 1989 - 2016 | University Of Nairobi | LECTURER |

## GENERAL STATEMENT ON RESEARCH AREAS

| |
|---|
| Prof. Koteng’s research interests are in construction materials, with specific interest in high performance concrete, and alternative binders for concrete. |
| Investigation on the use of EN Portland pozzolana and pozzolanic cements, both incorporating natural pozzolana, in the production of high performance concrete. |

## CURRENT RESEARCH PROJECTS

| | |
|---|---|
| Experimental and Numerical Investigation of the Effect of Sugarcane Bagasse Ash as Partial Cement Replacement on Mechanical and Functional Properties of Normal and High Strength Concrete | Pozzolanic cement. |
| STRUCTURAL PERFORMANCE OF CONCRETE COLUMN REINFORCED BY BORASSUS AETHIOPUM MART TIMBER | Alternative concrete reinforcing material. |

## SELECTED PUBLICATIONS

| TITLE | LINK TO PUBLICATION | YEAR |
|---|---|---|
| Effect of Plastic Bottle Arrangement on the Performance in Self-Compacting Concrete Block | View online | |
| Strength development of lime-pozzolana pastes with silica fume and fly ash. | View online | |
| Evaluating Superplasticizer Compatibility in the Production of High Performance Concrete using Portland Pozzolana Cement CEM II/B-P. | View online | |
| Concrete use for sustainable development | View online | |
| Concrete strength prediction using multi-linear regression model: a case study of Nairobi Metropolitan. | View online | |
| Effects of different fine aggregate on concrete strength. | View online | |
| Construction Practices on Expansive Soils in Kenya. | View online | |

## POSTGRADUATE STUDENTS SUPERVISION

| NAME | PROJECT TITLE | PERIOD |
|---|---|---|
| Tareg Abdalla Abdalla Abdalla | Experimental and Numerical Investigation of the Effect of Sugarcane Bagasse Ash as Partial Cement Replacement on Mechanical and Functional Properties of Normal and High Strength Concrete | August 2021 - ongoing. |
| Julien GBECHI | Numerical simulation of the flexural behaviour of biform Polyethylene Terephthalate fiber concrete with nano corn cob ash. | August 2021 - ongoing. |
| Ahouefa Reine KATTE | PERFORMANCES PREDICTION OF PALM KERNEL SHELL CONCRETE WITH ULTRAFINE PALM OIL FUEL ASH AS SUPPLEMENTARY CEMENTITIOUS MATERIAL | August 2020 - ongoing. |
| JAMES MAINA KIAMBIGI | EFFECTS OF DIFFERENT FINE AGGREGATE ON CONCRETE STRENGTH | March 2016 - March 2021 |
| OUBEDOULAYE KONE | STRUCTURAL PERFORMANCE OF CONCRETE COLUMN REINFORCED BY BORASSUS AETHIOPUM MART TIMBER | June 2021 - ongoing. |
| Ofwa Thomas Omollo | EVALUATING SUPERPLASTICIZER COMPATIBILITY IN THE PRODUCTION OF HIGH PERFORMANCE CONCRETE USING PORTLAND POZZOLANA CEMENT CEM II/B-P | June 2017 - September 2020. |
| NYAMBURA BANICE MWANGI | EVALUATING THE BEHAVIOUR OF DIFFERENT SUPERPLASTICIZERS APPLIED TO POZZOLANIC CEMENT CEM IV/B-P TO DEVELOP HIGH PERFORMANCE CONCRETE | June 2017 - ongoing. |
| Kiburi Isaiah Achini | Effect of Mixing Methods on Strength Characteristics of High Performance Concrete. | June 2017 - ongoing. |
| Ngunjiri Joseph Mwangi | Production of high performance concrete using EN 197 CEM IV/B-P Portland pozzolana cement with silica fume addition. | March 2017 - ongoing. |
| ABONG'O PAUL AKUMU | COMPARISON BETWEEN HIGH PERFORMANCE CONCRETE MADE USING OVEN DRIED AGGREGATES AND AIR DRIED AGGREGATES. | January 2019 - ongoing. |
| Joshua O. Ramogi | Structural strength and performance of cement-stabilized block walls. | Graduated 1991. |
| Moses Kiliswa. | Effect of quarry dust on the strength and permeability of concrete. | Graduated 2012. |
| Barrack Okoya. | Investigations into the cementitious properties of a mixture of rice husks ash with building lime. | Graduated 2013. |
| AHMED OMAR ROBLEH | EFFECT OF PLASTIC BOTTLES ARRANGEMENT IN SELF-COMPACTING CONCRETE BLOCK | June 2020 - October 2021 |

## COURSES TAUGHT

| NAME | DESCRIPTION | PERIOD |
|---|---|---|
| BRIDGE ENGINEERING | History of bridge-building. Types of bridges. Materials for modern bridges. Loads on bridges – standard truck and lane loading. Impact loads. Wind and seismic loads. Thermal loads. Serviceability criteria – deflection and fatigue. Non-composite vs. Composite Design. T-Beam. Plate Girder Bridges – general approach. Box Girder Bridges. Pressurised Concrete Bridges. Optimum Bridge Proportioning. Bridge Aesthetics, Inspection, Rehabilitation. | October 2020 - TO-DATE |
| TUNNEL ENGINEERING | Tunnelling and underground space development. Factors affecting shape. Size and route of tunnels. Geological investigation relevant to tunnelling. History of tunnelling. Soft ground tunnelling Rock tunnelling. Design of tunnel lining. | May 2021 - TO-DATE |
| HARBOUR ENGINEERING | Sea port and its importance in the national and international communication systems, Location of harbour, Natural and artificial harbours; Accessibility and size, Trade winds, Waves and their action on marine structures, Docks | January 2021 - TO-DATE |
| STRUCTURAL DESIGN OF HIGHRISE STRUCTURES | Philosophy and design criteria of tall buildings. Design concepts for framed, shear wall, tubular and coupled structures. Considerations for lateral loads - wind & seismic. Structural analysis and design of typical tall buildings. Computer applications to the analysis of tall buildings. | January 2021 - TO-DATE |
| ADVANCED STRUCTURAL CONCRETE DESIGN | 1.1 Concrete Mix Design: 1.2 Prestressed concrete design: 1.3 Prestressing of statically indeterminate structures: 1.4 Concrete in aggressive environments. Seismic-resistant design. | June 2019. - TO-DATE |
| ADVANCED STRUCTURAL DESIGN | The nature and function of a structure. Fundamental criteria for design of structures. Design of shell structures, elevated water tanks, tall buildings, and cable structures. | March 2021 - TO-DATE |
| BEHAVIOUR AND DESIGN OF STEEL STRUCTURES | The behavior of structural steel members. Structures and connections by welding and bolting. The significance of the behaviour in terms of design and the development of design specifications. Elastic and non elastic behaviour. Buckling. Ultimate capacity. Fatigue. Brittle fracture. Plate girder design including tension field action. Tubular section design – stable and unstable equilibrium. Elastic instability and critical loads. | March 2021 - TO-DATE |
| STRUCTURAL MATERIALS | (i). Relevance of materials properties as determined by test procedures to practical structural and building requirements. (ii). Composite materials and fibre-reinforced matrices. (iii). Ferro-cement. (iv). Stability of materials under service conditions. (v). Investigation of locally produced alternative materials. | August 2021 - TO-DATE |
| THEORY OF STRUCTURES IIB | 1.1.1 Structural Dynamics. 1.1.2 Formulation of equations for single degree of freedom. 1.1.3 Undamped and damped systems. 1.1.4 Forced vibrations. 1.1.5 Multi-degree of freedom dynamics. 1.1.6 Introduction to Earthquake Engineering. | January, 2020 - TO-DATE |
| CIVIL ENGINEERING MATERIALS I | Construction materials and environmental consideration. Concrete technology. Introduction to types. Concrete making materials. Properties of fresh and hardened concrete. Mixing, placing and curing. Mix design. Destructive and non-destructive tests. Quality control, durability, and special concrete. Masonry: building stone, block and brick types. Properties, uses, deterioration properties of mortar. Quality control tests on masonry and mortars. | March 2017 - TO-DATE |

## PROFESSIONAL AFFILIATIONS AND SOCIETIES

| TITLE | INSTITUTION |
|---|---|
| Registered Consulting Engineer | Engineers Board of Kenya. |
| Corporate Member. | The Institution of Engineers of Kenya. |

EXTRA INFORMATION

## DESCRIPTION

**Prof. David O. Koteng'** is a Kenyan citizen with over 43 years of postgraduate engineering experience, 12 of which were obtained in industry and 31 in teaching and research. For 12 years he worked in the Structural Department of Ministry of Public Works rising from Assistant Engineer to Superintending Engineer and was involved in the design and implementation of buildings projects, highway structures, and marine structures. For the next 28 years he taught at the University of Nairobi, rising from Lecturer to Senior Lecturer. For the past 3 years he has been Associate Professor in the School of Civil and Resource Engineering at The Technical University of Kenya, and since October 2019 he has been head of the Department of Structural and Construction Engineering and Director of the School of Civil and Resource Engineering. He is also currently serving as Adjunct Professor at the Pan African University Institute of Sciences Technology and Innovation (PAUISTI), domiciled at Jomo Kenyatta University of Agriculture and Technology (JKUAT) where he teaches coursework to Ph.D. students and supervises research at both M.Sc. and Ph.D. levels. He has also served as external examiner for M.Sc. and Ph.D. theses at PAUISTI and JKUAT. He has also been appointed Adjunct Professor at Dedan Kimathi University of Technology (DeKUT) with effect from 1st March 2021 where he is incharge of M.Sc. (Structures) program. Prof. Koteng' is a Registered Consulting Engineer with the Engineers Board of Kenya and is a corporate member of the Institution of Engineers of Kenya. He has undertaken several engineering consulting works for the Government of Kenya, University of Nairobi, and other agencies. He has also authored academic papers in international refereed journals, international conferences, and local conferences and seminars. His research interests are in high performance concrete, alkali activated cements, and pozzolanic cements.