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Skills & Competences

Research



Concrete Materials



Eurocodes & Standards



Documentation Applications



Pedagogy



Languages

English

Expert

Kiswahili

Expert

Interests

Concrete | Eurocodes | BIM |
Civil Engineering Science |
Rugby | Match Officiating |
Revit | Robot | Project
Management |

Eng. Muthomi Munyua

BSc Civil Eng, MSc Struct Eng (Nairobi)

P.Eng, MIEK, MAAK(E), GIStructE

P.O. Box 4679 – 30100

ELDORET

An innovative researcher focusing on sustainable construction and resilient design with eight years' experience providing solutions to structural engineering challenges

Work Experience

- 09/2022 – Present Nairobi, Kenya
Tutorial Fellow
University of Nairobi
 - Lectures Undergraduate Students
 - Laboratory Coordinator
 - Civil Engineering Design and Consultancy
- 09/2018 – 09/2022 Nairobi, Kenya
Graduate Assistant
University of Nairobi
 - Running a Eurocode Adoption Programme
 - Lectures Architecture & Civil Engineering Students
 - Research & Publications
- 07/2016 – 09/2018 Nairobi, Kenya
Graduate Engineer, BIM Coordinator
Mangat, I.B. Patel & Partners
Consulting Engineers
 - Civil Works
 - BIM Level 2 Implementation
 - Construction Supervision
 - Project Management
 - Structural analysis, design and detailing

Academic Qualifications

- 09/2024 – In Progress Ongoing
Doctor of Philosophy in Civil Engineering
National Taiwan University, Taiwan
- 09/2017 – 09/2021 Awarded
Master of Science in Civil Engineering (Structures)
University of Nairobi, Kenya
- 09/2011 – 09/2016 Honours
Bachelor of Science in Civil Engineering
University of Nairobi, Kenya
- 01/2010 – 08/2011 Merit
Diploma in Business Information Technology
Strathmore University, Kenya
- 06/2006 – 11/2009 Mean Grade: A
Kenya Certificate of Secondary Education
Mang'u High School, Kenya

Professional Associations

- Engineers Board of Kenya (EBK) Professional Engineer: **A4216**
- Institution of Engineers of Kenya (IEK) Corporate Member: **M.6326**
- Architectural Association of Kenya (AAK) Corporate Member: **6177**
- Institution of Structural Engineers (IStructE) Graduate Member: **078397746**

Personal Achievements

- Class Representative
- Officiated in International Rugby Events

Patents

- Working on a patent for an economic mould for concrete cubes to BS EN 12390-1:2012

Training, Seminars & Short Courses

COURSE	OUTLINE
<ul style="list-style-type: none"> ▪ 09/2015 Introduction to Concrete Technology University of Johannesburg	<ul style="list-style-type: none"> • Advancement in Concrete Technology • Concrete Additives and admixtures • Civil Engineering Science
<ul style="list-style-type: none"> ▪ 09/2016 Robot Structural Analysis Autodesk	<ul style="list-style-type: none"> • Modelling Strategies • Calculations and Results Presentation • Steel Frame Sizing • Reinforcement of R.C. Elements
<ul style="list-style-type: none"> ▪ 12/2016 Risk Management in Construction Architectural Association of Kenya	<ul style="list-style-type: none"> • Risk management in Construction sites • Professional indemnity insurance • Making buildings accessible to People with Disabilities
<ul style="list-style-type: none"> ▪ 01/2019 Pedagogy & Andragogy Training University of Nairobi	<ul style="list-style-type: none"> • Transfer of skills and knowledge • Effective teaching of mature people • Problem based teaching approaches
<ul style="list-style-type: none"> ▪ 07/2019 Training on Eurocodes (Steel) Kenya Bureau of Standards	<ul style="list-style-type: none"> • Applying actions on Structures • Design of Steel Structures to Eurocodes • A proposal on developing Kenya's National Annexes
<ul style="list-style-type: none"> ▪ 07/2019 Training on Eurocodes (Concrete) Kenya Bureau of Standards	<ul style="list-style-type: none"> • Applying actions on Structures • Design of Concrete Structures to Eurocodes
<ul style="list-style-type: none"> ▪ 02/2021 Training on Eurocodes (Geotechnical Design) Kenya Bureau of Standards	<ul style="list-style-type: none"> • Design approaches in Eurocode 7 • Design of foundations
<ul style="list-style-type: none"> ▪ 02/2021 Training on Eurocodes (Bridges) Kenya Bureau of Standards	<ul style="list-style-type: none"> • Actions on Bridges • Seismic resistance of Bridges

MSc Thesis

1. **Master of Science in Civil Engineering (Structural Engineering)** ▪ Complete
 Thesis: Effect of Carbon Fibre Reinforced Polymer Strengthening on the Axial Capacity and Ductility of Non-slender Square Concrete Columns ▪ DOI:10.6084/m9.figshare.15043686.v1

Academic Paper Presentations

1. **A Study of Deep Excavations and Excavation Support Systems in Soft Soils** ▪ Kwale, Kenya
 23rd Institution of Engineers of Kenya Annual Conference 2016
2. **Economic Design of Structures: Determining Wind Actions in Kenya according to the Eurocode** ▪ Nairobi, Kenya
 University of Nairobi Architecture & Engineering Conference 2019
3. **Academia & Practice: Retrofitting Columns with CFRP** ▪ Mombasa, Kenya
 27th Institution of Engineers of Kenya Annual Conference 2020

Teaching – Undergraduate Courses

1. **FCE 232: Strength of Materials II** ▪ Department of Civil & Construction Engineering, University of Nairobi
 Shear in beams, Torsion, Combined stresses, Buckling of Struts and Theories of Failure
2. **FCE 246: Concrete Materials** ▪ Department of Civil & Construction Engineering, University of Nairobi
 Cement manufacture, Testing and Properties of Concrete
3. **FCE 531: Structural Design IIA** ▪ Department of Civil & Construction Engineering, University of Nairobi
 Design of Steel and Reinforced Concrete Buildings considering horizontal actions

Teaching – Undergraduate Courses

4. FCE 431: Structural Design IA Philosophy of Limit State Design, Design of beams, slabs, columns and beams, Yield line analysis and principles of prestressed concrete	▪ Department of Civil & Construction Engineering, University of Nairobi
5. BAR 303: Theory & Design of Structures IA Introduction to Reinforced Concrete Design	▪ Department of Architecture & Building Science, University of Nairobi
6. BQS 313: Reinforced Concrete Structural Design Introduction to Reinforced Concrete Design	▪ Department of Real Estate, Construction Management & Quantity Surveying, University of Nairobi
7. BID 206: Structures Forces in structures, equilibrium equations and building structural elements	▪ Department of Art & Design, University of Nairobi
8. BDS 202: Structures Forces in structures, equilibrium equations and building structural elements	▪ Department of Art & Design, University of Nairobi

Administrative Appointments

1. Coordinator of Postgraduate Studies Department of Civil & Construction Engineering	▪ University of Nairobi
2. Coordinator – Concrete & Large Structures Laboratory Department of Civil & Construction Engineering	▪ University of Nairobi
3. Member of KEBS/TC173 of Developing the Kenya National Annexes to the Eurocodes Standards, Development & Trade – Engineering Section	▪ Kenya Bureau of Standards

Training – Courses to Professional Engineers

1. Eurocode 0 Basis of structural and geotechnical design	▪ Kenya Bureau of Standards
2. Eurocode 1 Actions on structures	▪ Kenya Bureau of Standards
3. Eurocode 2 Design of concrete structures	▪ Kenya Bureau of Standards
4. Eurocode 7 Geotechnical Design	▪ Kenya Bureau of Standards
5. Non-Destructive Testing of Concrete Three-day course for Structural Audits	▪ National Construction Authority

Significant Professional Engineer Engagements

PROJECT CLASSIFICATION	PROJECTS HANDLED	TASKS CARRIED OUT
Residential	<ul style="list-style-type: none"> ▪ Loresho Peaks: Estate with a private road consisting of 10 residential units each with swimming pool. ▪ Muthaiga: Private residence including basement involving geotechnical work 	<ul style="list-style-type: none"> • General arrangement drawings and Civil Works • R.C detailing drawings for slabs, beams, columns, staircase, and foundations. • Preparation of bar bending schedule for R.C works and quantity take offs • Inspection of works
Mixed-use Development	<ul style="list-style-type: none"> ▪ I&M Tower: 13-storey building consisting of retail mall and office block 	<ul style="list-style-type: none"> • Guided technicians to do R.C, detail drawings and bending schedules • Construction site supervision and project management

Significant Professional Engineer Engagements

PROJECT

CLASSIFICATION

PROJECTS HANDLED

TASKS CARRIED OUT

Industrial	<ul style="list-style-type: none"> ▪ Katangi Warehouses: Factory with mechanical equipment and storage 	<ul style="list-style-type: none"> • REVIT and ROBOT computer software to model and analyse the structures in 3D • Civil Works
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Chronological Professional Experience

From	To	Relevant technical and management experience
Nov 2023	Apr 2024	<ul style="list-style-type: none"> ▪ Supervision of the student underpass on Uhuru Highway between Main Campus and the Sportsfield. ▪ University representative for the land acquisition by the Kenya National Highways Authority for the expansion of the Nairobi Expressway.
Mar 2022	Dec 2023	<ul style="list-style-type: none"> ▪ Design of Pharmacy Building in KNH Campus, University of Nairobi. The building was a four-storey structure with an undergraduate basement.
Jan 2021	Feb 2023	<ul style="list-style-type: none"> ▪ I designed, detailed and supervised a 30m Perimeter Wall for Julius M. Mutuaruchiu in Eldoret, Uasin Gishu County.
Jan 2021	Mar 2022	<ul style="list-style-type: none"> ▪ I designed, detailed and supervised a 30m Perimeter Wall for Julius M. Mutuaruchiu in Eldoret, Uasin Gishu County.
Sep 2018	Jan 2020	<ul style="list-style-type: none"> ▪ I designed, detailed and supervised a four-storey residential building of two-bedroom apartments in Ngong, Kajiado County.
Sep 2019	Sep 2019	<ul style="list-style-type: none"> ▪ I made a structural inspection of cracks in a dormitory in Rusinga Island, Homa Bay County.
Mar 2019	Aug 2022	<ul style="list-style-type: none"> ▪ I designed, detailed and supervised a three-storey residential house for Mutahi in Limuru, Kiambu County.
Jan 2019	Dec 2021	<ul style="list-style-type: none"> ▪ I designed, detailed and supervised a two-storey residential house for Ms. Jacinta in Kenol, Murang'a County.
Mar 2020	Apr 2020	<ul style="list-style-type: none"> ▪ I conducted a structural Audit of St. Theresa Kindergarten, in Tena Estate in Nairobi City County.
Jan 2019	Mar 2019	<ul style="list-style-type: none"> ▪ I inspected a residential bungalow of Mr. Victor Oduor in Ngong, Kajiado County.
Aug 2019	Dec 2020	<ul style="list-style-type: none"> ▪ I took part in a consultancy project involving the strengthening of a six-storey residential building by retrofitting 108 No. reinforced concrete columns with carbon fibre reinforced polymer wrap in Ruaka, Kiambu County.
Oct 2017	Sep 2018	<ul style="list-style-type: none"> ▪ I designed and detailed residential buildings for Muthaiga Associates, a set of residential houses in Muthaiga, Nairobi City County.
Aug 2017	Jan 2018	<ul style="list-style-type: none"> ▪ I performed a structural audit of a commercial building – a 13-storey I&M Building on Limuru Road, Nairobi City County. I supervised the retrofitting of the structure.
Aug 2017	Sep 2017	<ul style="list-style-type: none"> ▪ I designed a warehouse – Katangi Godowns on Milton Obote Road, Kisumu County which had concrete columns and steel trusses.
Jan 2017	June 2018	<ul style="list-style-type: none"> ▪ I designed, detailed and supervised Junior Staff Houses for M-Pesa Foundation Academy – in Thika, Kiambu County.
Aug 2016	May 2019	<ul style="list-style-type: none"> ▪ I designed and detailed one typical house for a Residential Estate with 10 No. Houses in Jambo Parterre Estate in Loresho, Nairobi City County. I supervised the construction of the 10 houses and the civil works for the estate.

Publication Record

University Profile:	http://profiles.uonbi.ac.ke/muthomi	ORCID ID:	0000-0002-5786-4032
Researcher ID:	ABD-7389-2022	Google Scholar:	Muthomi Munyua
Publications:	Otieno, L.A., Abuodha, S., Mumanya, S., & Munyua, M. (2023). Influence of Corn Cob Ash – Silica Fume Blend on the Mechanical and Durability Properties of Concrete. <i>Andalasian International Journal of Applied Science, Engg. And Technology</i> , 3(2), Article 2. https://doi.org/10.25077/aijaset.v3i2.86		

Publication Record

- Njagi, J. A. M., Okoya, B. O., & **Munyua, M.** (2022). Investigation into the Effect of Rice Husk Ash in Partial Replacement of Cement in Concrete. *East African Journal of Engineering*, 5(1), Article 1. <https://doi.org/10.37284/eaje.5.1.894>
- Munyua, M.** (2021). *Effect of Carbon Fibre Reinforced Polymer Strengthening on the Axial Capacity and Ductility of Non-slender Square Concrete Columns* (Master's Thesis, University of Nairobi).
<http://erepository.uonbi.ac.ke/bitstream/handle/11295/155247/munyua.pdf>
- Munyua, M.** (2021). Determining the Magnitude of Wind Loads on Structures in Kenya according to the Eurocodes. *ScienceOpen Preprints*. <https://doi.org/10.14293/S2199-1006.1.SOR-.PPBRJ1U.v3>
- Munyua, M.** (2013). A study of deep excavations and excavation support systems in soft soils. University of Nairobi.

Ongoing Research

1. **Master of Science in Civil Engineering (Structural Engineering) Effect of Band Width and Band Spacing on Carbon Fibre Reinforced Polymer Strengthening on the Axial Capacity and Ductility of Non-Slender Square Concrete Columns.**
 - Proposal Stage
Stephen Juma - F56/38795/2020
University of Nairobi
2. **Determination of Kenya Wind Map for the Kenya National Annex to KS EN 1991 - Eurocode 1: Actions on structures, general actions Part 1-4 Wind Actions**
 - Joint collaboration between University of Nairobi, National Construction Authority and the Kenya Meteorological Department
3. **Determination of peak ground accelerations in Kenya for the Kenya National Annex to KS EN 1998 – Eurocode 8: Design of structures for earthquake resistance**
 - Joint collaboration between University of Nairobi, National Construction Authority and the Geological Society of Kenya

Undergraduate Supervision for Final Year Projects

1. **Effect of Steel Reinforcement on the Axial Capacity of CFRP Strengthened Non-slender Square Concrete Columns**
Complete
 - Neville Onyanicha Ondari,
F16/40430/2011
University of Nairobi
2. **Comparison of Partial and Full CFRP Confinement on the Axial Capacity of Non-Slender Square Plain Concrete Columns**
Complete
 - Muthii Lee Kiranga
F16/36405/2016
University of Nairobi
3. **Effect of Concrete Grade on the Axial Capacity of CFRP Strengthened Non-slender Square Plain Concrete Columns**
Complete
 - Godana Abdu Godana,
F16/43533/2017
University of Nairobi
4. **Effect of Concrete Grade on the Axial Capacity of CFRP Strengthened Non-slender Square Reinforced Columns**
Complete
 - Kilonzo Muinde
F16/1803/2017
University of Nairobi
5. **Comparison of Recycled Concrete Aggregate and Recycled Brick Aggregate on the Workability and Mechanical Properties of Concrete**
Complete
 - Brian Chamia
F16/103677/2017
University of Nairobi
6. **Comparison of Underside and U-Wrap of CFRP on the Flexural Capacity of Plain Concrete Beams**
Ongoing
 - Enoch Iradukunda
F16/132177/2018
University of Nairobi
7. **The Effect of CEM I, II, III and IV on the Mechanical Properties and Workability of a Standard Prescribed Concrete**
Ongoing
 - Vivian Ote
F16/134630/2018
University of Nairobi
8. **Investigation on the Mechanical Properties and Workability of Different Dosages of Fibre Mesh**
Ongoing
 - Nimrod Kembe
F16/138317/2019
University of Nairobi

Referees

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