

Alok Dua, Ph.D., EIT

PEO No.-100556025 (Experience submitted)

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SUMMARY OF SKILLS

- More than ten years of progressive industry experience in project management of high-value construction projects.
- Doctorate in Civil Engineering with a research focus on the blast-resilient design of structures. Implemented experimental techniques for research, design, and data analysis during the thesis.
- Associate member of technical committee updating CSA S850. Contributed to three sub-committees.
- Member of the technical committee for updating Indian Standard IS 4991. Led sections for close-in detonations and underground explosions.
- More than six years of teaching experience as an instructor, teaching assistant, and research associate.
- Experience in the Canadian National Building Code (NBC), Ontario Building Code (OBC) and relevant standards for concrete and steel structures.

EDUCATION

Doctor of Philosophy, Civil Engineering - 2014-2019

Carleton University, Ottawa, Canada

Thesis: Reinforced Concrete Element Response to Contact Explosion Effects and Mitigation Strategies

Master of Engineering, Infrastructure Protection and International Security - 2018-2020

Carleton University, Ottawa, Canada

Master of Technology, Structural Engineering - 2010-2012

Indian Institute of Technology (IIT) Delhi, New Delhi, India

TU Braunschweig, Germany

Thesis: Structural Behavior of Transmission Lines under Gust Loading

Bachelor of Technology, Civil Engineering - 2005-2008

Jawaharlal Nehru University (JNU), Delhi, India

Bachelor of Science - 1997-2000

Jawaharlal Nehru University (JNU), Delhi, India

PROFESSIONAL EXPERIENCE

Research Officer, Defense Research and Development Organization (DRDO) –

2022-2023

Srinagar, India

- Supported data acquisition for avalanche prediction and issued early warnings to operational troops.
- Contributed towards the finite element simulation model for avalanche mechanism and snow research.
- Gained experience with piezometers, slope inclinometers and crack gauges for early warning of snow avalanches.

Structural Designer, Aadmish Inc. and S N Associates –

2018-Present

Ottawa, Canada and Delhi-Noida NCR, India

- Managed renovation of a residential project in Ottawa.
- Analyzed and designed a 2B+G+12 RC building on STAAD Pro 2023 and created the working drawings with RCDC.

- Consulting designer in a Project Management Company (PMC).

Structural Designer, Military Engineering Services (MES) –

2016-2018

Mumbai, India

- Performed site investigations to identify the cause and extent of structural failures and created reports with repair or reconstruction strategies.
- Investigated failures or unexpected behaviours during construction and reported a corrective approach.
- Managed and administered retrofitting and rehabilitation projects at various life cycle stages in a marine environment.
- Reviewed and approved concrete mix designs for marine structures submitted by consultants for contract incorporation.
- Assisted the contract management and execution team from a structural design perspective.

Executive Officer, Government –

2014-2016

India

- Managed construction of steel modular structures in high-altitude areas.
- Managed the supply chain of prefabricated shelters for seamless construction activity with a major concern for the limited working season.
- Led a team of 120 personnel.

Executive Engineer, MES –

2012-2014

Goa, India

- Managed contracts for 11 projects at different stages over two years.
- Led a team of 20 assistant executive engineers.
- Handled an annual budget of \$20 million across the planning and execution phases.
- The following major projects were executed:
 - Rigid overlay of turning pads of a runway with 400 mm thick slab.
 - Pile foundation and erection of a pre-engineered steel hangar for aircraft.
 - RC framed structures for office space, single homes, and dormitory living.
 - Quantity survey for the overlay of the flexible runway of 3458 m.
- Managed budget, payments, product approvals, vendor negotiations, and quality assurance.
- Performed high-strength concrete mix designs, profiling of runways and turning pads and preliminary design of framed RC structures.

Executive Officer, Government –

2008-2010

India

- Taught civil engineering modules to officers:
 - Masonry Construction
 - Steel Construction
 - Asphalt road paving
- Managed projects for civic aid programs like modular steel shelters, bus stations, and basketball courts.
- Planned and executed asphalt and concrete pavement construction.
- Managed HR operations for 120 personnel.

Assistant Executive Officer, Government –

2000-2005

India

- Trained in construction activities ranging from combat engineering to RC framed structures.
- Acquired leadership and human resource management skills through training the platoon for combat engineering exercises.
- Led a team of 40 men for the execution of allocated tasks.

TEACHING EXPERIENCE

Instructor, Engineering Institute of Technology (EIT) – 2021-Present

Perth, Australia

- Supervised final-year graduate students for the thesis. One student graduated in 2023.
- Prepared course syllabus, delivery content, tests and evaluation.

Instructor, College of Military Engineering (CME) – 2020-2022

Pune, India

- Prepared and delivered the following courses:
 - Design of Steel structures (Graduate)
 - Structural Dynamics (Graduate and Undergraduate)
- Supervised four graduate students for graduate thesis and seminars.

Teaching Assistant and Research Associate, Carleton University – 2014-2020

Ottawa, Canada

- Conducted lectures, problem assessments, and grading of the following undergraduate courses:
 - Mechanics of Solids
 - Steel Design
 - Structural Analysis
 - Introduction to Structural Design
- Awarded with teaching assistant excellence in 2015.

RESEARCH EXPERIENCE

Adjunct Faculty at RMC, Kingston and Contract Instructor at EIT, Perth – 2021-Present

Kingston, Canada & Perth, Australia

- Collaborated with the faculty on experimental tests for the blast response of CMU walls.
- Worked on two research papers co-authored with the faculty. Presented research paper at the Military Aspects of Blast and Shock (MABS) conference.

Instructor, Faculty of Civil Engineering, College of Military Engineering (CME) – 2020-2022

Pune, India

- Conceptualized, developed and now managing a research program investigating the response of ultra-high performance concrete (UHPC) elements subjected to extreme impact and blast loads.
 - Collaborated with the Indian Institute of Technology (IIT) Bombay for UHPC test samples and field tests.
 - Collaborated with defence research institutes for data acquisition.
 - Performed experimental tests on specimens subjected to live projectile impact and blast loading.
 - Implementing numerical simulations on LS-DYNA to design a modular protective bunker system.
- Contributed to successful research funding on full-scale testing of RC structures as a co-PI – CAD 90,000.
- Collaborated on research on the heavy vehicular impact on CFFT bridge piers at Carleton University.
 - Performing numerical simulations of CFFT piers subjected to heavy vehicular impact.
- Supervised an MA.Sc student, Carleton University, for numerical simulations on LS-DYNA.
- Appointed as an advisor for a hospital construction project incorporating NZ bearings and fire safety solutions.

Ph.D., Dept. of Civil and Environmental Engineering, Carleton University – 2014-2019

Ottawa, Canada

Project: “Reinforced Concrete (RC) Element Response to Contact Explosion Effects and Mitigation Strategies”

Supervisor: Dr. Abass Braimah

- Contributed to developing a research program – Response of structural elements to blast loads.

- Contributed to a successful external research funding awarded to the supervisor – CAD 20,000.
- Modelled a research project in LS-DYNA for the National Research Council (NRC), Canada.
- Conceived the methodology for the experimental tests with live explosives.
- Planned and executed the construction of RC columns and slabs for live explosive tests.
- Developed validated numerical models on LS-DYNA for simulations of blast events.
- Performed analysis and design of RC column members to resist blast loads.
- Designed and executed Carbon Fibre Reinforced Polymer (CFRP) retrofit blast-damaged members.

Research Scholar, Institute for Steel Structures, TU Braunschweig –

2011-2012

Braunschweig, Germany

Project: “Numerical Analysis of Electrical Power Lines and Towers under Buffeting Wind Loads.”

Supervisor: Dr. Ing. Mathias Clobes

- Prepared a project proposal for the successful Deutscher Akademischer Austausch Dienst (DAAD) funding grant – €6750.
- Contributed to conceiving the project deliverables for a state-funded program on the cascading failure of power transmission lines in Germany.
- Developed validated numerical models on finite element software SAP2000 and executed Visual Basic (VB) codes on SAP2000.

HONORS/AWARDS

Doctor of Philosophy, Civil Engineering

- Best Student Paper Award - 2017
Canadian Society of Civil Engineers (CSCE), Montreal
- Teaching Assistant (TA) Excellence Award - 2015
Carleton University, Ottawa, ON
- Shastri Indo-Canadian Institute grant (Awarded to supervisor) - 2016
Shastri Indo-Canadian Institute (SICI), New Delhi
- Kochar Family Scholarship - 2014
Phoenix Homes, Ottawa, ON

Master of Technology, Structural Engineering

- Best M.Tech. Thesis Award - 2013
Indian Society of Wind Engineering (ISWE), New Delhi
- First in Structural Engineering program - 2012
Indian Institute of Technology (IIT), Delhi
- DAAD scholarship for sandwich model thesis - 2011
German Academic Exchange Service (DAAD), New Delhi

Bachelor of Technology, Civil Engineering

- Gold medal in the civil engineering program - 2008
College of Military Engineering (CME), Pune
- ‘Best Civil Engineering Project’ Award - 2008
College of Military Engineering (CME), Pune
- ‘Best in airport, marine and railway engineering’ award - 2008
College of Military Engineering (CME), Pune
- ‘Best in structural analysis’ Award - 2008
College of Military Engineering (CME), Pune
- ‘Best in Structural Design’ Award - 2008

PUBLICATIONS AND CONFERENCE PAPERS

- Dua, A., Braimah, A., & Kumar, M. (2022). *Influence of Standoff Distance on the Response of RC Columns Subjected to Close-in Explosions*. *Journal of Structural Engineering (JSE)*. doi:10.1061/(ASCE)ST.1943-541X.0003360
- Dua, A., & Braimah, A. (2020). Assessment of Reinforced Concrete Slab Response to Contact Explosion Effects. *Journal of Performance of Constructed Facilities (ASCE)*, 34(4). doi:10.1061/(ASCE)CF.1943-5509.0001469
- Dua, A., Braimah, A., & Kumar, M. (2020). Experimental and Numerical Investigation of Rectangular Reinforced Concrete Columns Under Contact Explosion Effects. *Journal of Engineering Structures*, 205. doi:https://doi.org/10.1016/j.engstruct.2019.109891
- Dua, A., Braimah, A., & Kumar, M. (2019). Contact explosion response of RC columns: an experimental and numerical investigation. *Proceedings of the Institution of Civil Engineers - Structures and Buildings*, 1-22. doi:10.1680/jstbu.18.00223
- Dua, A., Clobes, M., Höbhel, T., & Matsagar, V. A. (2015). Dynamic Analysis of Transmission Lines. *Electronic Journal of Structural Engineering*, 15(1): 46-54.
- Dua, A., & Braimah, A. (2019). Influence Of Axial Load Ratio On The Response Of RC Columns Subjected to Contact Explosion Effects, International Symposium on the Interaction of the Effects of Munitions with Structures (ISIEMS), Panama City, Florida, USA. <https://www.bundeswehr.de/de/organisation/infrastruktur-umweltschutz-und-dienstleistungen/aktuelles/veranstaltungen/isiems>
- Dua, A., Braimah, A., & Kumar, M. (2019). *Contact Explosion Response of Reinforced Concrete Columns: Experimental and Validation of Numerical Model*. 6th International Disaster Mitigation Specialty Conference: Canadian Society for Civil Engineering (CSCE) Fredericton, New Brunswick.
- Dua, A., & Braimah, A. (2017). *Efficacy of Concrete Constitutive Models for Bullet Impact Tests*. 6th International Engineering Mechanics and Materials Conference: Canadian Society of Civil Engineers Vancouver, Canada. pp. 521 521-510.
- Dua, A., Braimah, A., & Matsagar, V. (2017). *Understanding the Response of Reinforced Concrete Slabs due to Contact Explosion of TNT*. 6th International Engineering Mechanics and Materials Conference: Canadian Society for Civil Engineering (CSCE) Vancouver, Canada. pp. 522 521-510.
- Dua, A., & Braimah, A. (2016). *State-of-the-Art in Near-Field and Contact Explosion Effects on Reinforced Concrete Columns*. 5th International Structural Specialty Conference: Canadian Society for Civil Engineering London, Canada. pp. 1:12 (STR-836).

MEMBERSHIPS, VOLUNTEER ACTIVITIES AND HOBBIES

- Reviewer at the International Journal of Protective Structures (IJOPS).
- Reviewer at the ASCE Journal of Structural Engineering.
- Reviewer at the ASCE Journal of Constructed Facilities.
- Member of the American Society of Civil Engineers (ASCE).
- Member of the Canadian Society for Civil Engineering (CSCE).
- Technical Committee, Bureau of Indian Standards (BIS).
- Volunteer mentor at Ottawa Community Immigrant Services Organization (OCISO).
- Volunteer at Engineers of Tomorrow.
- Developing Python algorithms for Options Trading, an avid squash player (city ranking - 176), and loves tutoring high-school maths.