TANVIR SHAMS QURESHI

Department of Civil Engineering, Leading University, Bondor bazar, Sylhet-3100, Bangladesh.
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EDUCATION

2012 - Present **PhD Engineering**
University of Cambridge, UK
Thesis: The role of expansive minerals in the autogenous and autonomic self-healing of cement based materials
Web. http://www-geo.eng.cam.ac.uk/directory/tsq20@cam.ac.uk
Completed in November 2016

2011 **M.Sc. Civil Engineering,** (**Awarded Distinction**)
Cardiff University, Cardiff, UK
Thesis: Reinforced Concrete Structure Design based on Concrete Mix Characteristic Length

2007 **B.Sc. Civil & Environmental Engineering**.
Shahjalal University of Science & Technology, (SUST).
Final year project: Wind load impact on the foundation and portal frame structure design of an aircraft hanger

ACADEMIC AND PROFESSIONAL WORK EXPERIENCE

Oct 2015 - Jan 2016 **Teaching assistant**, Div. of Civil Structure and Geotechnical Engineering
University of Cambridge, (www.eng.cam.ac.uk), UK

Jan 2012 - Sep 2012 **Assistant Professor**, Department of Civil Engineering
Leading University, (http://www.lus.ac.bd/author/tanvir-sq/), Bangladesh

Jan 2009 - Dec 2011 **Lecturer**, Department of Civil Engineering
Leading University, Bangladesh

Jan 2007 - Sep 2012 **Project Engineer/Consultant (Materials and Structure design)**
Noksa Construction & Consultancy, (www.noksabd.com), Bangladesh

RESEARCH PROJECTS AND INTERESTS

Projects involved:

Materials for Life (M4L) project- £ 2.8 m (2013-2016). Involved in research and field application of Self-healing concrete. This is a research project to develop self-healing concrete, funded by EPSRC

Renewable Materials for Civil Construction (RMCC) project- ~£0.7 m (2009-2012). Research collaborator in the department of civil engineering at Leading University

Field of Interests:

- Self-healing and repairing cementitious smart materials in Civil Infrastructure
- Microstructural analysis of innovative and sustainable building materials
- Non-linear elastic fracture mechanics of concrete and structure analysis
- Characterization of advanced composites and engineering materials
- Structural optimization for infrastructure design
- Multi-scale modeling of composite and concrete materials
- Non-destructive testing for structural health monitoring and damage detection

SELECTED AWARDS / DISTINCTIONS

2014 **Electron Microscopy prize,** ZEISS PHOTOGRAPHY COMPETITION UNIVERSITY OF CAMBRIDGE, UK

2014 **ITV news, UK,** SELF-HEALING CONCRETE, UK
(Web: http://www.itv.com/news/anglia/2014-12-05/scientists-work-on-solution-that-can-self-heal-cracks-in-pavements/)

2014 **Best poster award,** IDB-UK 2014 SYMPOSIUM**,** UNIVERSITY OF CAMBRIDGE, UK
2013 **Wiley poster award,** FOURTH INTERNATIONAL CONFERENCE ON SELF-HEALING MATERIALS, BELGIUM
2012 **IDB-Cambridge Int. Scholarship** PHD, UNIVERSITY OF CAMBRIDGE, UK
2012 **Acting Head in Civil Engineering,** (June-September, 2012), LEADING UNIVERSITY, BANGLADESH
2011 **Distinction, M. Sc. Civil Engineering,** PHD, CARDIFF UNIVERSITY, UK
2010 **Best lecturer in Civil Engineering,** LEADING UNIVERSITY, BANGLADESH
2008 **Best Engineer 2007-2008,** NOKSA CONSTRUCTION & CONSULTANCY, BANGLADESH
2004 **SUST Merit Scholarship,** Award for top students in Undergraduate study in SUST

SELECTED TECHNICAL AND COMPUTER SKILLS

- Microstructural analysis using Scanning electron microscopy (SEM), Energy-dispersive X-ray spectroscopy (EDX), Quantitative X-ray diffraction (QXRD), TGA, and FTIR
- Mechanical testing of structural elements (Concrete, Steel and Polymers)
- StaadPro (structural analysis design software)
- LUSAS (FEM analysis)
- E-Tabs
- AutoCad
- MatLab
- Microsoft Office, Microsoft Visio
- Origin

PROFESSIONAL AFFILIATIONS AND SERVICE

2016-Present	Journal Reviewer, Multidiscipline Modeling in Materials and Structures
2015-Present	Journal Reviewer, Construction and Building Materials
2016	P. Eng in Progress, Engineering, Professional Engineers Ontario, Canada
2013-2014	Graduate student member of the Council of Technology, University of Cambridge
2013	Fellow, Engineering, Cambridge Philosophical Society
2012	Member, Department of Engineering, Cambridge University Engineering Society
2012	Member, N/A, Cambridge commonwealth European and international trust
2012	Member, N/A, IDB-UK Scholars Association
2011-Present	Graduate member, Civil Engineering, Institution of Civil Engineers, UK
2009-Present	Member, Institute of Engineers Bangladesh (IEB)
2010-2011	Student Representative (MSc Civil Engineering, Cardiff University, UK
2006	Vice President, Association of Civil & Environmental Engineering, SUST
2005	Coverer (Organizer), Housing and Environment Fair, Sylhet, Bangladesh

SELECTED ACADEMIC CONFERENCES AND SEMINARS ORGANIZED

- SECED 2015 Conference on Earthquake Risk and Engineering towards a Resilient World (9-10 July 2015), Homerton College, University of Cambridge, UK
- These successful events were International Symposium on Geomechanics from Micro to Macro on 1-3 September 2014; 13th Young Geotechnical Engineers Symposium on 30 June – 02 July 2014, University of Cambridge, UK
- Seminar on “BNBC-Earthquake code evaluation with other design codes” in August 2010 at Garden Inn conference hall, Sylhet, Bangladesh. Key note speaker.
- Seminar on “Use of modern plastic in Plumbing Engineering” in July 2010 at Leading University, Sylhet, Bangladesh. Key note speaker.

- Seminar on “Earthquake porn Sylhet & role of Civil engineers” on January 28, 2008. Presented the use of Staad Pro. in R.C.C building designing & how to consider earthquake factors while designing frame structure.

SCIENTIFIC CONTRIBUTIONS

Selected Peer-reviewed Journal Papers:

- **Qureshi, T**., A. Kanellopoulos and Al-Tabbaa, A., 2016, Encapsulation of expansive powder minerals within a concentric glass capsule system for self-healing concrete, **Construction and building materials**, Volume 98, 15 November 2015, Pages 780–791
- **Qureshi, T.,** and Al-Tabbaa, A., 2016, Self-healing of drying shrinkage cracks in cement-based materials incorporating reactive MgO, **Smart materials and structures**, Volume 25, Issue 8
- A. Kanellopoulos, **Qureshi, T.** and Al-Tabbaa, A., 2015, Glass encapsulated minerals for self-healing in cement based composites, **Construction and building materials**. Volume 98, 15 November 2015, Pages 780–791
- **Tanvir Qureshi,** Mustaq Ahmed, 2015, "Waste Metal For Improving Concrete Performance And Utilisation As An Alternative Of Reinforcement Bar"Vol. 5 - Issue 2 (February - 2015), **International Journal of Engineering Research and Applications (IJERA)** , ISSN: 2248-9622 , www.ijera.com
- R. Das, T. S. Qureshi, M. S. J. Chowdhury and M. J. B. Alam, 2012, Health Factors in Islamic Perspectives and its Relation to Sustainability with Case Study at Traditional and Modern Mosque, Bangladesh Journal of Environmental Science, 5(1): 01-08, 2012, ISSN 1999-7361
- Aziz, M., **Qureshi, T.,** Bashak, S., and Alam, J.B., 2010, Multiple regression analysis of traffic noise level of the urban city for prediction of environmental degradation, In the Journal of Noami (National Oceanography and Maritime Institute, Bangladesh).
- **Qureshi, T.S**., Alam, J.B., and Basak, S.R., 2009, Rational evaluation of the existing pavement of Sylhet-Sunamgonj highway, Bangladesh Journal of Environmental Science, Vol. 17, 39-46.

Peer-reviewed Journal Papers under Process:

- Qureshi, T., A. Kanellopoulos and Al-Tabbaa, A., 2016, Impact of bentonite and quicklime on the autogenous self-healing performance of MgO-Portland cement systems, **Cement and Concrete Composites** [Under review]
- Qureshi, T.S. and Al-Tabbaa, A., 2016, The impact of crack formation age on the autogenous self-healing of cementitious materials with or without expansive minerals, **Construction and Building Materials** [Under review]

Selected Peer-reviewed Conference Papers:

- Qureshi, T., Al-Tabbaa, A., 2015. Influence of expansive minerals on the drying shrinkage crack self-healing capacity of cement for concrete, in **European Materials Research Society (E-MRS) Fall Meeting, Symposium E Self-Healing Materials – from Concepts to Market.** Warsaw, Poland. doi:10.13140/RG.2.2.23275.95526
- Qureshi, T., and Al-Tabbaa, A., 2015, Influence of Expansive minerals on the Self-healing of Cement Paste and Mortar Systems, **Fifth international conference on self-healing materials, Durham**, USA. DOI: 10.13140/RG.2.1.4720.6242
- Qureshi, T., Al-Tabbaa, A., 2014. The effect of magnesia on the self-healing performance of Portland cement with increased curing time, in **1st International Conference on Ageing of Materials & Structures.** Delft, The Netherlands, pp. 635–642. doi: 10.13140/RG.2.1.4458.4804

- Qureshi, T., and Al-Tabbaa, A., 2014, MgO based mineral additives for self-healing I concrete, **Young Researchers' Forum II: Construction Materials in University College London**, London, UK
- Qureshi, T.S., Al-Tabbaa, A., 2013. Self-healing Concrete with Minerals and Biological Agents, in **Fourth International Conference on Self-Healing Materials**. Ghent, Belgium.

Oral presentation at other Conference and Seminars:

- Materials for Life (M4L) research project final symposium, 26 Sep 2016, Cardiff University, UK
- Sidney Sussex Graduate Conference, University of Cambridge, Cambridge on 28 February 2015
- CUED Geotechnical and Environmental Research Group Workshop 2014 in the Department of Engineering, University of Cambridge, on 23rd June 2014.
- 1st Scholars Scientific Symposium of the Islamic Development Bang Scholars Association-UK, 2014 (IDBSSS 2014) in the Department of Engineering, University of Cambridge, on 22nd May 2014.
- Sidney Sussex Graduate Conference, University of Cambridge, Cambridge on 01 March 2014
- Young Researchers' Forum II: Construction Materials in University College London, London, UK, February 2014.
- Division D: Civil, Structural, Environmental and Sustainable Development, Graduate Conference, 9th November 2013
- Seminar on "BNBC-Earthquake code evaluation with other design codes" in August 2010 at Garden Inn conference hall, Sylhet, Bangladesh. Keynote speaker.
- Seminar on "Use of modern plastic in Plumbing Engineering" in July 2010 at Leading University, Sylhet, Bangladesh. Keynote speaker.
- In the 28th January 2008, I have attended a seminar on "Earthquake porn Sylhet & role of Civil engineers". I have presented the use of Staad Pro. in R.C.C building designing & how to consider earthquake factors while designing frame structure.

International news and magazine articles:

- Department of Engineering news report 'Taking concrete to the next level' November 2015
- Featured news 'Concrete heal thyself' on Materials world magazine, Volume 23, No.8, August 2015.
- Self-healing concrete research news on The Chinese Weekly July 2015
- Featuring news on Health-conscious concrete in Research horizon, Issue 26, 2015.
- ITv news report on the self-healing concrete research by our group in Cambridge [December 5, 2014].
- The art of engineering: images from the frontiers of technology, Department of Engineering, University of Cambridge research news report in 2014.
- Self-healing concrete 'most likely to change the world' department news on 04 Nov 2013
- Department news report on the winning of the award at International Self-healing Materials Conference, September 2013.

Unpublished work:

- M.Sc. Thesis Reinforced Concrete Structure Design based on Concrete Mix Characteristic Length

SELECTED WORKSHOPS AND TRAINING

- Geotechnical and Environmental Research Group Workshop, University of Cambridge, 22 June 2016
- How to write about science policy... and do it well!, CUSPE Workshop, University of Cambridge, 23 March 2016
- The First Cambridge Workshop on Energy, Transport and Urban Infrastructure (ETUI), 21 Sep 2015
- Geotechnical and Environmental Research Group Workshop, University of Cambridge, 25 June 2015
- IWCEA-2014, International Workshop on Civil Engineering and Architecture, August 8-9, 2014, Istanbul, Turkey
- Geotechnical and Environmental Research Group Workshop, University of Cambridge, 23 June 2014
- CUED Geotechnical and Environmental Research Group Workshop, University of Cambridge, 21 June 2013
- ISCHM Interactive Multi-Material Workshop in The 4th International Conference on Self-Healing Materials, Ghent University, Belgium, 18 June 2013
- BIM (Building Information Modelling) - Steel and Timber Design, Cardiff University, 2011
- The River modelling for river basin management, Cardiff University, 2011
- Civil engineering Structures, Specialised professional workshop for fresh engineers, CEE, SUST, 18 Nov 2011
- Software application related to structural design for young engineers, Specialized Technical Workshop, CEE, SUST, 20 Oct 2011
- Ethical responsibilities of civil engineers, Noksa construction & consultancy firm, 2009
- Earthquake Resistant Techniques According to Bangladesh National Building Code (BNBC)- Department of Civil Engineering, BUET in collaboration with Comprehensive Disaster Management Programme (CDMP) and Ministry of Food and Disaster Management (MoFDM), 09 to 12-June 2009
- Manpower planning in building construction using critical path method, Noksa construction & consultancy firm, 2008
- Quality control in Civil Engineering Constructions-2007- Noksa construction & consultancy firm
- Modern Strategic Marketing in Civil engineering Consulting Firms, IEB, 2007
- Participatory Management of Low-Cost Water Supply and Sanitation - ITN-Sub-centre, SUST, Bangladesh, 1-4 December 2005
- Auto CAD (2d &3D)- C & E Education and research, Bangladesh, September to December 2005

TEACHING AT UNIVERSITY OF CAMBRIDGE

Supervised: Two undergraduate final year student with self-healing cement research project

Courses taught:

Experiment A2: Model Structures

There are six different experiments (one to be carried out by each pair) designed to test the limits of certain assumptions. The six experiments are: Tubular beam, Sandwich beam, Square tube with mitre bend, Slim I-beam, Curved cantilever, Right-angle cantilever. Each of these tests a particular set of assumptions based on linear elastic beam theories which are covered in 1A Structure course.

3D3: Structural Materials & Design

This laboratory experimental is designed to teach undergraduate students the basic of reinforced concrete structural materials and design where concrete is combined with a ductile tensile material.

Integrated Coursework: Buildings in Earthquakes

The integrated coursework activity is a set of experiments designed to bring together a number of engineering disciplines to study various aspects of a single problem. In this project, the student will be looking at some of the issues involved in the design and analysis of buildings in earthquakes. Following the short experiments, students undertake an extended exercise to explore one particular aspect of the problem in more detail.

TEACHING AT LEADING UNIVERSITY

Course taught:

CE-131: Engineering Mechanics-I
3 hours/ week, Credit-3
Resultants and components of forces; coplanar concurrent forces; moments & parallel coplanar forces; non-concurrent, non-parallel, coplanar forces; maximum and minimum forces; non-coplanar forces; centroid; moments of inertia of areas; moments of inertia of masses.

CE-133: Engineering Mechanics-II
3 hours/ week, Credit-2
Friction, Flexible Cords, Graphical Methods, Plane Motion, Relative Motion, Force System that Produce Rectilinear Motion. Work, Kinetic Energy and Power, Impulse and Momentum.

CE-231: Mechanics of Solids-I
3 hours/week, Credit-3
Fundamental concepts of stress and strain, Mechanical Properties of materials; Strain energy, Stresses and strains in members subjected to tension, Compression, shear and temperature changes; bending moment and share force diagram of beans and frames; flexural and shearing stresses in beams; shear centre; thin walled pressure containers; riveted and welded joints.

CE-211: Environmental Engineering-I
3 hours/week, Credit-3
Water supply: Introduction, water requirements, Estimate of water use, Essential elements for designing a water supply system of city, pumping system for water supply, water quality, drinking water standards, alternative technologies for problem areas in Bangladesh, Shallow shrouded tube well (SST), Very shallow shrouded Tube well (VSST), pond sand filter (PSF), Deep set Technologies, solar stills, Rainwater harvesting, Industrial water pollution and their control sewerage, Wastewater and its characteristics, Introduction to aerobic and anaerobic treatment of waste, water, self-purification of stream, BOD removal kinetics, Tropical diseases, Design and constructions of sewer, Environmental sanitation, Introduction to environmental sanitation, environmental pollution, environmental protection and management, sanitation practices in Bangladesh, different sanitation options-various types of pit latrines, poor flash latrines etc. Air pollution and its control.

CE-331: Structural Engineering-I
3 hours/week; Credit-3
Stability and determinacy of structure, Analysis of statically determinate beams, frame, trusses, and arches; Influence lines for statically determinate beams, frames and trusses; moving loads; Approximate analysis of statically indeterminate structures for vertical and lateral loads; Earthquake analysis of the building.

CE-333: Design of Concrete structure-I
3 hours/week, Credit-3

Introduction: Materials and properties of reinforced concrete; Flexural design of reinforced concrete singly, doubly and T-beams and one-way slab in WSD; Flexural design of singly, doubly and T-beams in USD; Design of beams for shear and diagonal tension, bond, anchorage and development length according to WSD and USD; Deflection of beams; Edge supported slabs (two-way).

CE-335: Structural Engineering-II
3 hours/week, Credit-3
Analysis of indeterminate structures by consistent deformation method, moment distribution method, and column analogy method; Two hinged arches; cable and cable-supported structure; Deflection of beams, frames and trusses using different methods.

CE-431: Structural Engineering-III ***(Developed Course)***
3 hours/week, Credit-2
Analysis of statically indeterminate structures (beam, frame, truss) by consistent deformation method, matrix displacement method, matrix force method and slope deflection method; space truss analysis, Influence lines for statically indeterminate structures.

Formal Feedback from Students:

Table: Student feedback rating based on overall teaching performance.
(1=very poor, 2=poor, 3=satisfactory, 4=good, 5=excellent)

Course	2009	2010	2011	2012
CE-131: Engineering Mechanics-I	3.8	4.2	4.8	
CE-133: Engineering Mechanics-II	3.7		4.1	4.4
CE-231: Mechanics of Solids-I		4.0	4.3	4.6
CE-211: Environmental Engineering-I		3.8	4.0	
CE-331: Structural Engineering-I			4.2	4.7
CE-333: Design of Concrete structure-I			4.3	4.5
CE-332: Design of concrete structure-I Sessional				4.6
CE-335: Structural Engineering-II				4.2
CE-431: Structural Engineering-III				4.6

PARTICIPATION IN PEER CONSULTATION (SELECTED)

- **The James Dyson building project** (2015-2016):

In the department of engineering, University of Cambridge, UK. Involved in the conceptualization and development of Self-healing concrete blocks and Building Information Modeling (BIM) on construction scheduling of the project using Primavera P6

- **City Corporation Library Building:**

This is a project of Sylhet City Corporation, Bangladesh. A Six storied 50,000 s.ft. modern library Building with semi-basement car parking, conference hall, and corporate leaving facilities. I was involved in RCC frame structure and met foundation designing and specialized supervising during construction. The building was successfully completed and under service by City corporation.

- **Sharmeen & Zumana twins tower (6 storied):**

This is a project of Marlin Builders pvt. Ltd. Each tower consists of 10 apartment facilities and a community garden area at the rooftop. I was involved in sub-soil investigation, pile foundation, and frame structure design. As a project supervision in-charge, I have monitor the project construction time to time associating with sit engineers and architect. The building is successfully completed. (web: http://merlingroup.com.bd/sharmeen-zumana-tower/)

- **Landmark Shopping Complex (11 storied, 40,000 s.ft./floor):**

I was project engineer, supervising the project construction by interpreting the design supplied by design engineers. During my supervision period, I have successfully completed mat foundation and ground floor construction work.

- **Latibunessa tower (12 storied, 10,000 s.ft/floor):**

This is a modern residential come commercial tower building incorporating commercial facilities up to first six floor and residential apartments in the rest. The tower is located in the heart of the Sylhet city. I was hired by Noksa for project quantity surveying, structural design investigation, and supervision.

- **Barakatullah Electro Dynamics Limited (BEDL):**

The objective of the project is to provide an examination and assessment of principal environmental impacts of the extension of the power plant and outline of an environmental management plan. **I was a coordinator and Environmentalist** in this project and drafted the report. The project was successful and the power plant is up and running (web: http://bedlbd.com/)

- **Royal City Housing Project:**

This is a project of Environmental Impact Assessment (EIA) of the proposed housing development work by Royal Homes Pvt. Ltd. The study area is located at Lalmati 24^0-51'; latitude and 91^0-53'E longitude). I was the coordinator as well as Environmentalist in this project and drafted the report. Overall analysis results positive impact and hence government approved the project. (web: http://www.royalhomesltd.com/)

- **Division of roads and High way:**

Sub-soil investigation for the proposed bridge on Sylhet-Golapgonj-Charkai-Zokigonj Road at 90^{th} Km (gap no 90/1), under Sylhet Road Division, Bangladesh government.

REFERENCES

On request