Muhammad Saad Khan

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Education

- PhD in Structural Earthquake Engineering from NED University 2025
- Masters in Structural Engineering from NED University 2018
- Bachelors in Civil Engineering from NED University (2nd Rank) 2014

Research Experience

- **Modelling of Masonry In-fill as Single Compression Strut (Bachelors Final Year Project)**

Bare and In-filled full scale single storey and single bay frames were tested under quasi-static conditions. Project dealt with numerical modelling using simplified macro modelling approach using SAP2000.

- **Structural behaviour of recycled aggregate concrete (Masters Dissertation)**

Shear and Flexure controlled recycled aggregate concrete beams were investigated experimentally for structural behaviour. Changes in crack patterns, load deflection response and stiffness were quantified. Furthermore, different code formulations (e.g. ACI-318, Eurocode2, and Model Code 2010) were used to predict load carrying capacity of recycled aggregate concrete beam specimens. FE modelling was also done using 'ATENA 2D'.

- **Behaviour of Reinforced Concrete Columns Reinforced with Locally Manufactured Steel Bars (PhD)**

Behaviour of reinforced concrete columns under reversed cyclic loading was investigated experimentally along with numerical simulation. With the objective of checking adequacy of code based provisions and formulations.

- **Foam Concrete model reconstruction using CT Scan images**

This project deals with the 3d model reconstruction of foam concrete using CT Scan images. Computer software 'Avizo' is used for model reconstruction. The reconstructed models were used for permeability and thermal conductivity experiment simulation. Numerical output was compared with experimental results.

- **Micro-zonation of Karachi city using micro-tremor data**

Micro-tremor data is being collected for different towns of Karachi, the data will be used to evaluate average shear wave velocity which will eventually be used for micro-zonation.

Professional Experience

- **NED University of Engineering & Technology (Mar 2015 till Date)**

Designation: Lecturer, Department of Civil Engineering

- **Jaffer Brothers Pvt. Ltd. (Jaffer Agro Services) (Jan 2015 – Feb 2015)**

Designation: Design Engineer in "HEIS" (High Efficiency Irrigation Systems) Department
Responsibilities: Design of Drip Irrigation systems (part of 'PIPIP' Punjab Irrigation Proficiency Improvement Project funded by WHO).

Journal Publications

- Khan, A. U. R., **Khan, M. S.**, Fareed, S., & Xiao, J. (2020). Structural behaviour and strength prediction of recycled aggregate concrete beams. *Arabian Journal for Science and Engineering*, *45*, 3611-3622. https://doi.org/10.1007/s13369-019-04195-w

- Batool, F., **Khan, M. S.**, & Bindiganavile, V. (2021). Characterization of 3D microstructure, thermal conductivity, and heat flow of cement-based foam using imaging technique. *Frontiers of Structural and Civil Engineering*, *15*(3), 643-651. https://doi.org/10.1007/s11709-021-0709-9

- Rafi, M. M., **Khan, M. S.**, Ahmed, S., & Rais, A. (2022). Study of experimental behaviour of seismically retrofitted earthen structures. *International Journal of Masonry Research and Innovation*, *7*(5), 549-568. https://doi.org/10.1504/IJMRI.2022.125357

- Rafi, M. M., **Khan, M. S.**, Rais, A., & Ahmed, S. (2022). Experimental assessment of proposed seismic strengthening scheme for adobe structures. *Advances in Structural Engineering*, *25*(15), 3044-3058. https://doi.org/10.1177/13694332221114072

- Batool, F., Sangi, A. J., **Khan, M. S.**, & Islam, K. (2022, December). Material characterization of a historical wall by using destructive and non-destructive techniques. In *Structures* (Vol. 46, pp. 1669-1678). Elsevier. https://doi.org/10.1016/j.istruc.2022.11.006

- Rafi, M. M., & **Khan, M. S.** (2024). Comparison of Seismic Performance of Adobe Structures Strengthened with Two Different Schemes. *Journal of Earthquake Engineering*, *28*(13), 3797–3819. https://doi.org/10.1080/13632469.2024.2354862

- Rafi, M. M., & **Khan, M. S.** (2024). Assessment of Use of Steel Bars with Unintended High Strength in Tied Columns. *ACI Structural Journal*, *121*(5), 65-76. https://doi.org/10.14359/51740852

- **Khan, M. S.**, Rafi, M. M., Farid, M. D., & Humberto, V. (2024). Seismic Performance of Concrete Columns Reinforced with Hot-Rolled Thermo-mechanically Treated Steel Bars. *Journal of Earthquake Engineering*, *29*(2), 396–420. https://doi.org/10.1080/13632469.2024.2427679

- **Khan, M. S.**, Rafi, M. M., Humberto, V. (2025). Experimental Behavior of Concrete Columns Reinforced with Thermomechanically Treated and Cold-Twisted Ribbed Steel Bars. *ACI Structural Journal*, *122*(3), 57–70. https://doi.org/10.14359/51744392

- **Khan, M. S.**, Rafi, M. M., & Varum, H. (2025). Effects of Lateral Confinement on Concrete Columns Reinforced with Steel Bars with Uncertain Yield Strength. *Journal of Structural Design and Construction Practice*, *30*(4), 04025097. https://doi.org/10.1061/JSDCCC.SCENG-1695

- Rafi, M. M., Mohammad, A. F., Ahmed, M., **Khan, M. S.**, Rais, A., & Baig, M. K. A. (2025). Tsunami Fragility Functions for Low-Rise Reinforced Concrete Buildings for Enhancing Coastal Resilience. *Journal of Structural Design and Construction Practice*, *30*(4), 04025086. https://doi.org/10.1061/JSDCCC.SCENG-1804

Conference Publications

- **Khan, S.**, & Khalid, F. (2019, February). Comparison of Inelastic Modeling Techniques using Static Pushover Analysis and Non-Linear Time History Analysis. In First South Asia Conference on Earthquake Engineering (SACEE'19), Karachi, Pakistan (Vol. 21, p. 22).

- Khan, A. U. R., **Khan, M. S.**, & Fareed, S. (2019) "Shear Behavior of Recycled Aggregate Concrete Beams," in 10th International Civil Engineering Conference (ICEC-2019), Karachi, Pakistan.

- Khan, A. R., Fareed, S., & **Khan, M. S.** (2019). Use of recycled concrete aggregates in structural concrete. Sustain. Constr. Mater. Technol., 2, 149940.

- Khan, G., **Khan, M. S.**, & Rafi, M. M. (2022). Behaviour of Concrete Column Reinforced with Steel Bars Exhibiting Uncertain Yield Strength. ICEC 2022. https://doi.org/10.3390/engproc2022022007

Relevant Computer Based Skills

- **Computer Aided Design and Analysis:** SAP2000, Seismostruct, ATENA, Opensees
- **Computer Aided Drawing:** AutoCad, Revit, Sketchup, Macromedia Freehand
- **Computer Languages & CAS:** FORTRAN, Matlab, Octave, Mathematica