

ACI Foundation-Funded Research Wins ACI's Wason Medal for Most Meritorious Paper

The Wason Medal for Most Meritorious Paper was founded in 1917 by Leonard C. Wason, Past President of ACI. Awarded annually since 1917, this Medal recognizes the author or authors of the most meritorious paper published by the Institute.

This year's awardees included Benjamin L. Worsfold, Jack P. Moehle, and John F. Silva for their paper, "Moment Transfer at Column-Foundation Connections: Physical Tests," in the September 2022 issue of the *ACI Structural Journal*. In addition to the professional recognition of an excellent paper, this research was a high priority to ACI and the concrete industry because it investigated different design provisions for moment transfer at foundations and columns, provided design recommendations, and initiated a code change proposal for ACI 318.

The research project behind this paper was titled "Benchmark Tests on Anchoring Columns to Foundations" and was awarded by the ACI Foundation in 2017.

"The test program was especially important because it clearly showed the limitations of some models that have been used for design of column-to-foundation connections and clearly identified the need to consider breakout failures in the foundation supporting the column. The findings are widely applicable to steel, cast-in-place, and precast column connections."

The research goal was to develop a critical set of laboratory experiments to explore the requirements for anchoring columns to concrete foundations.

Moment transfer at the connection of columns and foundations is challenging for designers due to the lack of widespread consensus on which design provisions apply and



Moment transfer test specimen design and experimental setup

the wide variation in results from the three different models commonly applied. The primary objective of the research was to describe and test the three models and, from those results, highlight considerations for potential new provisions that bring about more economical designs that still retain the necessary safety factors. An ACI 318 Code change proposal resulting from this study is currently in the balloting process.

The code change proposal that developed from the test program applies not only to column-to-foundation connections but also to other types of connections where groups of reinforcing bars are anchored to concrete anchorage zones. The proposal also includes provisions for strengthening the anchorage zone using shear reinforcement.

"The test program was especially important because it clearly showed the limitations of some models that have been used for design of column-to-foundation connections and clearly identified the need to consider breakout failures in the foundation supporting the column," said Jack P. Moehle, co-author and Principal Investigator (PI) of the research project. "The findings are widely applicable to steel, cast-in-place, and precast column connections."

The project was endorsed by ACI Subcommittee 318-B, Anchorage and Reinforcement, and was selected by the Concrete Research Council for support. Jointly funded by the ACI Foundation, American Institute of Steel Construction, and Hilti Corporation, the project had additional industry support for construction and demolition from Ron Klemencic, FACI, through the MKA Foundation, and from professional advisors Jim Malley and Rafael Sabelli.

For more project details, read "Moment Transfer at Column-Foundation Connections: Physical Tests" in the September 2022 issue of the *ACI Structural Journal*.