

# LATERAL ANALYSIS GUIDELINES FOR DRILLED SHAFTS IN NEVADA BASED ON LRFD FRAMEWORK

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## PROBLEM

Interest in using large-diameter drilled shafts in bridge foundations has grown in recent years due to the increased load capacity. Load and Resistance Factor Design LRFD can achieve consistent reliability between the superstructure and substructure. The uncertainties of load and resistance are quantified separately and are reasonably incorporated into the design process. Currently, NDOT's Design Manual lacks a rigorous and detailed methodology to undertake lateral analysis of deep foundations, specifically drilled shafts, under lateral loading which in turn yields inconsistent design practice in on-going and future bridge projects.

## OBJECTIVE

The principal objective of this research is to develop a design guideline for LRFD of drilled shafts under lateral loading. Several other state DOTs have already developed improved design guidelines, but are not compatible with the design practice in Nevada (i.e. large-diameter drilled shafts). It is crucially important for NDOT to develop a robust

and enhanced design methodology to carry out LRFD of large-diameter drilled shafts are common practice in the state of Nevada.

## METHODOLOGY

- Task 1: Collection and Compilation of Lateral Load Test Data
- Task 2: Verification and Validation of a New Methodology for LRFD of Laterally Loaded Drilled Shafts
- Task 3: Establish Point of Fixity Definition within LRFD Framework
- Task 4: Report and Implementation Plan

## IMPLEMENTATION POTENTIAL

This research, which will be available for immediate implementation by NDOT after this study, includes a validated tool, and a design guideline to carry out LRFD of large-diameter drilled shafts under lateral loading. These deliverables will be fully implementable by the end of the project. The projected benefits of this project are expected savings on foundation cost and improved bridge safety in future projects utilizing the guidelines and tool created.

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