LOADING SOURCE AT THE **FOUNDATION HEAD**

CENTER-HOLE OPENING FOR THE **TREMIE**

NO NEED FOR **SLICK LINE TREMIE**

CONSTRUCTABILITY ADVANTAGE

NO EMBEDDED **HYDRAULIC LINES**

ASTM GUIDELINES COMPLIANCE

NO JACK **STROKE LIMITATION**

EQUIVALENT **TOP-LOADING CURVE**

LOAD TEST **MATERIAL RECOVERABLE**

FORCE-STRAIN RELATIONSHIPS

FOUNDATION BASE RESISTANCE IMPROVEMENT

HYDRAULIC JACK ISSUES ADDRESSED AT THE TOP

UPWARD AND DOWNWARD FORCE-DISPLACEMENT PLOTS (**BUTTERFLY CURVES**)

Top- Loaded Bi-Directional Test

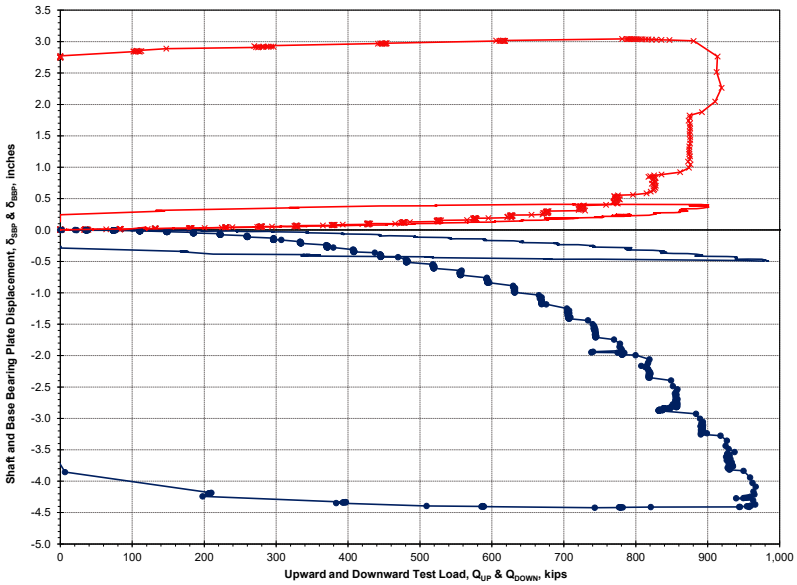
A new approach to Bi-Directional deep foundation testing

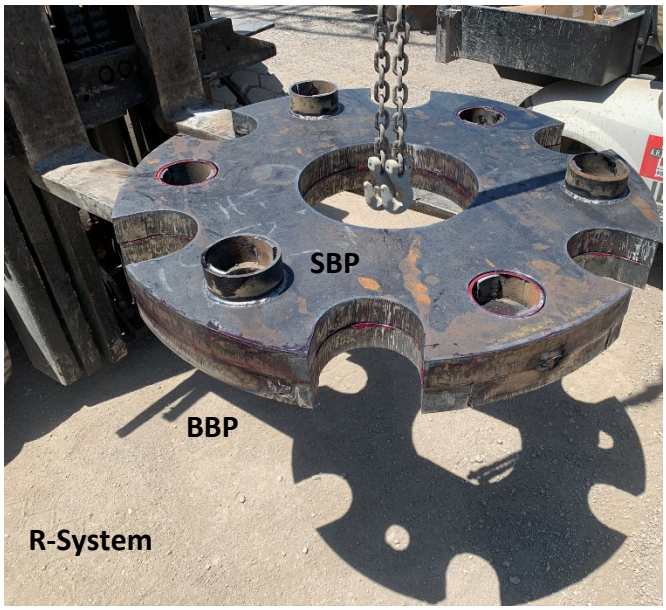
The Top-Loaded Bi-Directional Test ("TLBT") is a new method to apply bi-directional loads to a deep foundation element with the loading source located above the foundation head. In the TLBT reusable load assembly, loads are applied to the foundation using the **R-System** which consists of two stacked steel plates located at the geotechnical resistance balance point or at the foundation base connected to the load assembly via vertical elements. The top plate or the Shaft Bearing Plate **("SBP")** will transfer loads to the foundation upper portion, and the bottom plate or the Base Bearing Plate **("BBP")** will transfer loads to the foundation lower portion as well as the foundation base. At the surface, above the foundation head, a hydraulic jack is located between a Top **("TLA")** and Bottom **("BLA")** load assembly. The TLA and BLA are connected to vertical elements which are consequently connected to the R-system. As the jack is pressurized and expanded at the surface, the R-System plates are separated, and the foundation is bi-directionally loaded.

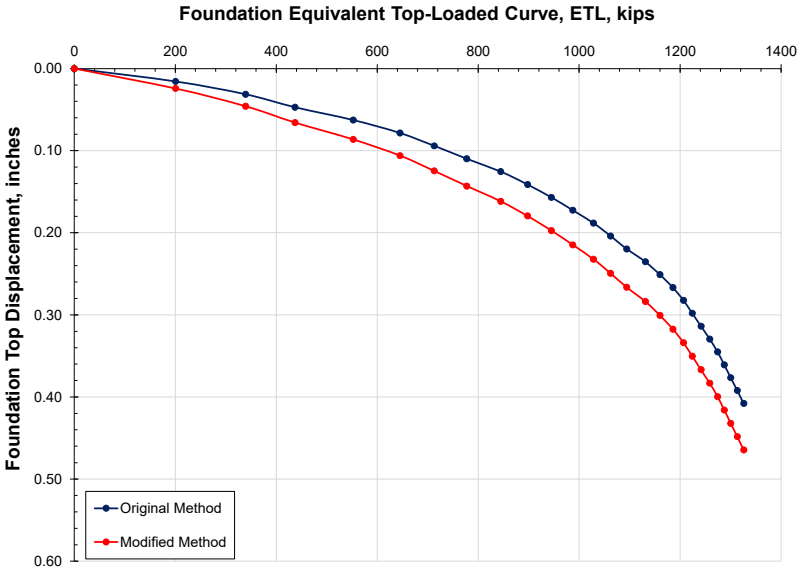
https://patents.google.com/patent/US20210102863A1/en?inventor=Rozbeh+B.+Moghaddam&oq=Rozbeh+B.+Moghaddam

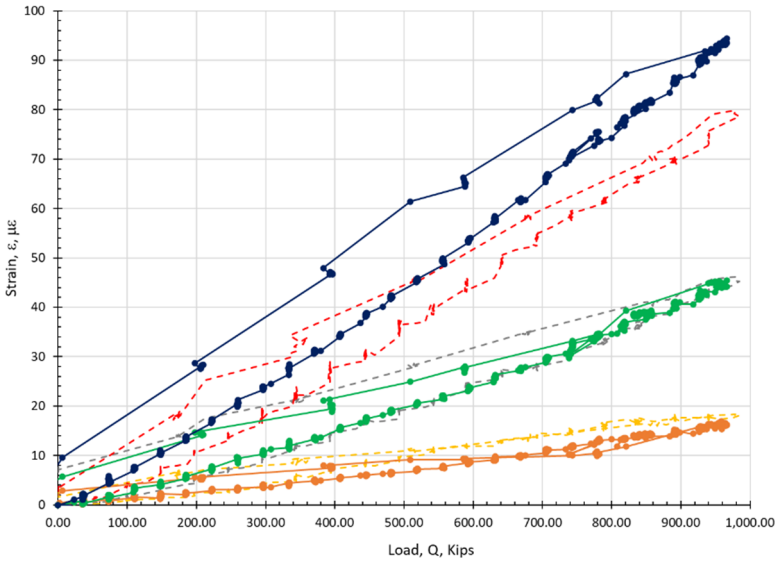
RBM Consulting Group, Inc.
9014 Green Rd, Converse, TX 78109
P: 726-777-4558 F: 726-777-4559
info@rbmcgroup.com

RBM CONSULTING GROUP, INC.
www.rbmcgroup.com









Upward Foundation Force-Displacement, and **Downward** Foundation Force-Displacement are measured using Telltales connected to the Shaft Bearing Plate and the Base Bearing Plate (Butterfly Curve).

The **Equivalent Top-Loading Curve ("ETL")** is calculated and plotted from the butterfly curve. These curves can be obtained using the original method, modified method, or the spring-based model, tz-Qz method. The ETL curve is used to determine and evaluate the geotechnical resistance for a deep foundation element.

To go from the collected data in the field to the plotted calculated data for engineering evaluation, the **Incremental Rigidity ("IR")** method is used. The IR method determines the relationship between axial rigidity and strain at a strain gage level. From this relationship, measured strains can be converted to internal forces without having to know neither a deep-foundation element's elastic modulus nor the cross-sectional area.

Strain-Force relationship is calculated from strain gage levels installed within the deep foundation element.

RBM Consulting Group, Inc.
9014 Green Rd, Converse, TX 78109
P: 726-777-4558 F: 726-777-4559
info@rbmcgroup.com

www.rbmcgroup.com