Foundation Rocking Practical Experience

Caltrans-PEER Seismic Seminar
June 8, 2009

Po Lam

Earth Mechanics, Inc.

Observation from Past Projects:

•Historical perspective that the structure will overturn due to Lack of moment capacity has been recognized as being very unrealistic.

- Rocking of spread footings have been more and more accepted by various agencies.
- For example Bart Retrofit Program viewed spread footings as being more favorable as compared to pile footings.
- Force based moment capacity versus demand evaluation procedure has been recognized as being overly conservative.

MCEER Research on Foundation Effects on Bridge Response

EFFECTS OF FOOTING ROTATION ON EARTHQUAKE BEHAVIOR OF PILE SUPPORTED BRIDGE PIERS

by

Gregory L. Fenves

Technical Report for
Earth Mechanics, Inc.

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Past Research Project: Sensitivity Studies

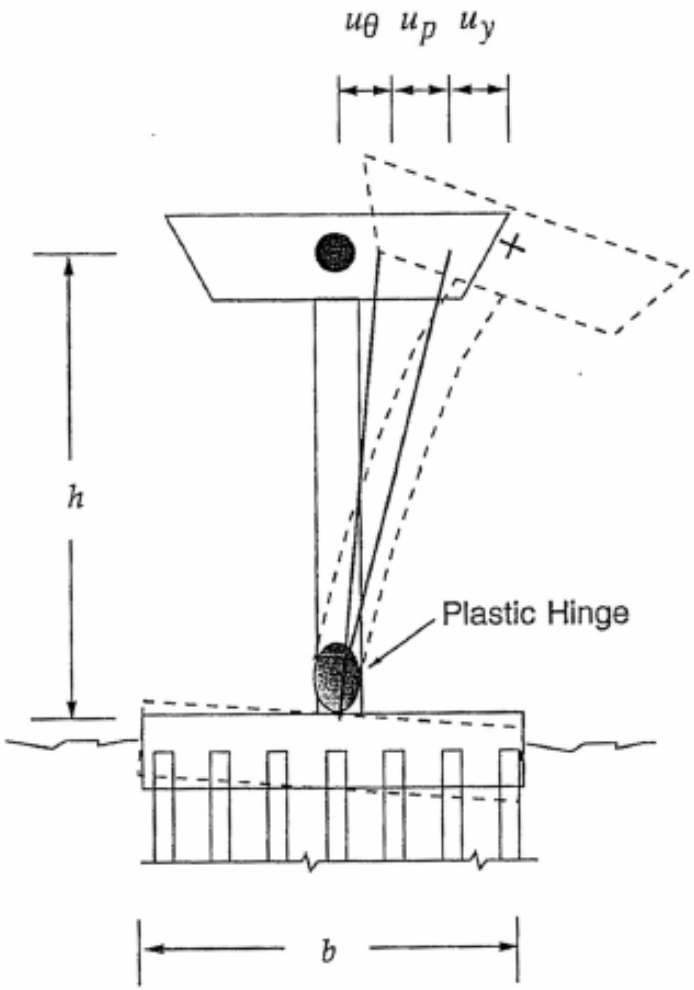

Figure 1. Single Column Bridge Bent on Flexible Pile Footing with Rotational Flexibility.

Lessons from Past Projects:

- Rocking reduces inelastic demand on superstructures.
- Peak displacements do not systematically increase due to foundation rocking.
- There are a number of difficulties in predicting permanent foundation displacements.