Lateral Loading of Cast-in-drilled-hole Shaft

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Objectives

- To gain research experience in preparation for graduate school.
- To assist in the project and learn about the testing instrumentation.
- To make a contribution to earthquake engineering research.
Project Background

- The project is funded by CalTrans and is coordinated by Eric Ahlberg.
- Planned and researched for the past 3 years.
- Test will provide better results due to the quantity and quality of the instrumentation.
- 2nd of 5 drilled shaft tests.
Project

• A previous lateral load test was conducted with a 6’ diameter column. This column was designed with a diameter of 2’ to gauge the effect of section geometry on the shaft performance.

• The lateral load test will help CalTrans better understand the behavior of drilled shafts and aid in future design.
Layout

FBG SENSORS @ 6" o.c. (4)

38'-4"

25'-0"

7'-6"

1'-0"

7'-6"

FBG SENSORS @ 18" o.c. (10)

DOOTS @ 6" o.c. (30)

Diagonal DOOTS @ 18" o.c. (10)
**Shop Work**

- Cutting, drilling, tapping, filling, sawing, stripping, soldering, and gluing the necessary materials for the setup of the sensors.
Sensors

- 50 LVDT - Linear Variable Differential Transformer
- 54 FBG - Fiber Bragg Grating
- 60 Strain Gauges
- 10-15 Inclinometers
Instrumentation Assembly
The Cage

- 2 PVC tubes containing LVDTs run down opposite sides of the shaft.
- Diagonal LVDTs go down the middle.
- Fiber-optic sensors line the whole shaft.
- Strain gauges are attached to the transverse and longitudinal reinforcement.
- Inclinometers run down a tube in the center of the shaft.
Data Acquisition

• Testing the sensors
• Recording the calibration in the sensors
• Raw voltage readings are taken in by the Data Acquisition Board and converted into displacement by a LabView program.
Summary

• This phase of the project will be testing soon.
• The project is expected to be completed in the Fall of 2006.
• Helping the project is providing a great research experience.