

# Drilled Shaft Foundation Inspection

## DESCRIPTION:

The Drilled Shaft Foundation Inspection course is a stand-alone training course developed to provide a basis for local, regional, or national qualification of drilled shaft foundation inspectors. The goal of this course is to provide drilled shaft foundation inspectors with practical knowledge and standard industry practices for the inspection of drilled shaft foundation construction. This course is designed to be of most benefit to foundation inspectors, who are responsible for or involved in providing inspection of drilled shafts during construction. Presentation of the course is in an interactive format so that the participants are actively involved in the learning experience. A two-hour qualification exam is administered on the third day of the course. This course follows recommended FHWA specifications and practices for drilled shaft construction, but this may be modified to follow local agency specifications and practices, which may deviate from recommended FHWA specifications and practices.

## OBJECTIVES:

Upon completion of the course, participants will be able to:

- Identify and understand the role and duties of the inspector
- Recognize key inspection elements of the contract documents
- Identify proper communication and coordination with the engineer and contractor
- Interpret and verify contractor compliance with drilled shaft installation plan items
- Recognize and identify drilled shaft construction equipment and tools
- Perform visual field verification of soil/rock material for comparison to supplied soil boring
- Calculate percent recovery and Rock Quality Designation (RQD)
- Recognize and identify the various types of drilled shaft construction
- Perform inspection of drilled shaft excavations for compliance to plans, construction tolerances and cleanliness
- Recognize and explain pre-mix mineral and polymer slurry tests and various integrity tests
- Verify reinforcing cage construction compliance including side spacers and SCL requirements
- Determine theoretical shaft concrete volumes and develop concrete curves
- Identify shaft "concreting" irregularities
- Perform calculations for volume, area, circumference and elevation
- Locate, explain, and apply applicable FHWA guide specifications/AASHTO/State DOT specifications relating to compliance
- Identify potential problems and safety issues
- Perform required reporting and pay quantity calculations

## WHO SHOULD ATTEND:

The primary audience is agency and consultant foundation or major structures inspectors. Additionally, project management and construction engineers in charge of drilled shaft construction inspection are encouraged to attend.

## COURSE REQUIREMENTS:

**All participants should bring calculators that can perform basic math, in particular work with negative numbers (a +/- function), a built in "Pi" function, and square root functions.** Students should bring note pads and pencils for taking notes and performing class exercises (if not provided by the host agency).

**All participants are encouraged to complete the FHWA Drilled Shaft Construction on-line tutorial. This will enhance the overall learning process and enhance performance on the end of course comprehensive exam. The tutorial is located at:**

<http://www.fhwa.dot.gov/infrastructure/tccc/tutorial/index.htm>

## INSTRUCTORS:

**Naresh Samtani, PhD, PE**  
**Peter W. Osborn**

## **INSTRUCTOR INFORMATION:**

**Naresh Samtani** is the owner and President of NCS Consultants, a geotechnical firm in Tucson, Arizona. Naresh earned his doctorate from the University of Arizona in Tucson and has over 18 years of experience. He has performed analysis, design and field investigations for a variety of multi-disciplinary urban transportation projects in different parts of the country. He has worked on approximately 85 bridges with configurations ranging from single span to 10-span that were over land and major river crossings. Most of these bridges were founded on drilled shafts with diameters ranging from 3-ft to 10-ft and depths ranging from 20-ft to 150-ft. Naresh has also designed retaining walls using drilled shafts, e.g., soldier-shaft and tangent/secant shaft walls. In addition to the various design methods, he has experience in dry, cased and wet shaft construction techniques including the use of wet construction techniques in dry shafts to prevent excessive caving. Naresh has performed large scale drilled shaft load tests including the then world record load test in 2001 where an 8.5-ft diameter, 135-ft deep drilled shaft was loaded to 34,000 kips. Naresh specializes in the use and interpretation of the shaft integrity testing methods and remediation of defective drilled shafts.

**Mr. Osborn** currently serves as Team Leader for the FHWA Geotechnical and Hydraulics Technical Service Team (Baltimore, Maryland). He holds a Bachelor of Science Degree in Civil and Environmental Engineering from the University of Rhode Island and a Master of Science Degree in Geotechnical Engineering from Northwestern University. Mr. Osborn has held a variety of Geotechnical positions throughout his career with the FHWA including: Operations Team Leader (FHWA RI Division), National Geotechnical Specialist (FHWA Headquarters), Lead Geotechnical Engineer – Boston Central Artery/Tunnel Project, and Midwest Regional Geotechnical Engineer (former FHWA Region 5). Prior to his employment with the FHWA, Mr. Osborn worked as a Geotechnical Consultant for firms in Louisville, KY and Providence, RI and also worked as a project manager for a General Contractor in Connecticut.

## AGENDA -- DRILLED SHAFT INSPECTOR'S QUALIFICATION COURSE

### MONDAY

8:00 – 8:40	1. Welcome and Introduction <i>5 minute stretch break</i>
8:45 – 9:30	2. Course Overview
9:30 – 9:45	<i>BREAK</i>
9:45 – 10:15	3. Dry Shaft Construction Method
10:15 – 11:30	4. Wet Shaft Construction Method <i>with 5 minute stretch break</i>
11:30 – 12:00	5. Casing Construction Method
12:00 – 12:15	Quiz
12:15 – 1:15	<i>LUNCH</i>
1:15 – 2:30	6. Auger Rigs and Equipment
2:30 – 2:45	<i>BREAK</i>
2:45 – 4:00	7. Soil and Rock Identification - Rock Core calculation exercise - Sample material handout and class exercise <i>with 5 minute stretch break</i>
4:00 – 4:30	8. Construction Documents - Plan Set Handout
4:30 – 5:00	Question & Answer Review Session – Assign Homework & Class Dismissal

### TUESDAY

8:00 – 8:30	* Homework Review
8:30 – 9:00	8. Construction Documents – (cont.)
9:00 – 9:30	9. Assembling Your “Tool Box”
9:30 – 9:45	<i>BREAK</i>
9:45 – 10:30	10. Contractor & Equipment Arrive On-Site - Distance calculation exercise
10:30 – 12:00	11. Shaft Excavation & Cleaning - Slurry Testing Demo <i>with 5 minute stretch break</i>
12:00 – 1:00	<i>LUNCH</i>
1:00 – 2:15	12. Reinforcing Cage - Side Spacer Exercise
2:15 – 2:30	<i>BREAK</i>
2:30 – 3:30	13. Concreting Operations
3:30 – 3:45	<i>BREAK</i>
3:45 – 4:30	13. Concreting Operations – (cont.) - Concrete Volume Exercise - Concrete Curve Exercise
4:30 – 5:00	Question & Answer Review Session – Homework & Class Dismissal

### WEDNESDAY

8:00 – 8:30	* Homework Review
8:30 – 9:15	14. Post Installation & Integrity Testing <i>5 minute stretch break</i>
9:15 – 9:20	
9:20 – 10:00	15. Safety Concerns - ADSC Safety Video
10:00 – 10:15	<i>BREAK</i>
10:15 – 12:15	** Qualification/Certification Exam

\* Instructors will be available by 7:15 am to help any students with homework.

A FIELD DEMONSTRATION IS PLANNED FOR WED. AFTERNOON.

\*\* Target time, student can have more time if needed to complete exam.

### Registration Procedure

- 1) Please contact Gail Ikeda at 956-8367, 956-8851 (FAX) or gail@eng.hawaii.edu by **Friday, April 1, 2005**
- 2) Attendance is limited to 30 participants, and preference is given to local government employees.

### Cancellations

Please contact us if you must cancel your registration or if someone will be substituting for you. Refunds will be made if notice of cancellations is received at least 3 workdays prior to the workshop date.

# Drilled Shaft Foundation Inspection

**April 11-13, 2005**

HDOT – HWY O  
Conference Room  
727 Kakoi Street  
8:00 a.m. – 4:30 p.m.

Workshop sponsored by the  
**Hawaii State Department of  
Transportation**  
and the  
**Hawaii Local Technical Assistance  
Program**  
in cooperation with the  
*University of Hawaii's Department of Civil Engineering  
and the Federal Highway Administration*

### Hawaii Local Technical Assistance Program

University of Hawaii at Manoa  
Department of Civil & Environmental Engineering  
2540 Dole Street, Holmes Hall #383  
Honolulu, Hawaii 96822

