Pile Driving Lesson 1 Transcript

Welcome to the Pile Driving Inspector Course. This is Lesson 1 - Introduction. To begin, select the start button or press Shift+N on your keyboard.

This is a course designed to assist students to understand the specifications and inspection practices in FDOT projects. The course and exam are based on the January 2015 Workbook Version of the FDOT Standard Specifications of Roadway and Bridge Construction.

In this course you will learn the basics of driven pile installation. The following basic aspects will be covered:

- Terminology
- Pile Driving Equipment
- Pile Driving Process
- 455 Specifications
- Inspector Duties

The basic terminology will be covered as well as the introduction to the Pile Driving Equipment typically used to install driven piles. From what to do when preparing for a project to the final pile record, each step of the Inspector's role and responsibilities will be covered. The pertinent 455 Specifications will be covered in detail. The specification version the course is based upon is the January 2015 Workbook.

This course has 9 lessons that we will cover. They are:

- Lesson 1 - Welcomes you to the course
- Lesson 2 - This lesson includes a detailed review of the equipment used in the driving of piles.
- Lesson 3 - This lesson provides for a look at the most common construction documents associated with driven pile projects, from the Inspector's view point. A sample Plan set and typical Pile Installation Plan are reviewed.
- Lesson 4 - In this lesson, the Inspector's role, duties and responsibilities are reviewed together with Inspector functions.
- Lesson 5 - An overview and familiarization with "Test Piles', their purpose, installation and testing.

- Lesson 6 - This covers the Inspector's duties when equipment and piles show up on-site.
- Lesson 7 - The Inspector's duties during the driving of the pile are reviewed together with applicable 455 specifications.
- Lesson 8 - Reviews the "When to Stop" decision the Inspector must make.
- Lesson 9 - A brief overview of Safety tips related to performing pile driving inspection. (This lesson is NOT INTENDED TO SERVE AS A SAFETY PLAN, NOR REPLACE ANY SAFETY PLAN OR REQUIREMENTS.)

Chapter 6 of the Construction Training Qualification manual (CTQM) provides details on the qualification requirements. Please refer to this chapter for more details. To be able to inspect driven piles in FDOT projects you must successfully complete: 30 days experience as per CTQM 6.6.2; 15 piles minimum; 10 piles with a Diesel Hammer; pass the exam.

We have two main types of foundations. Shallow foundations and deep foundations. Shallow foundations are typically used in structures under relatively good soils and not heavily loaded. For example 1 to 2 story residential buildings are typically founded in shallow foundations if there are no unsuitable materials underneath the foundation level. For heavier loads or if soils are not competent, then the use of deep foundations is required.

A Driven Pile is a deep foundation that is constructed by driving a concrete, steel or timber pile to support the anticipated loads in competent subsurface material. Other types of deep foundations are drilled shafts, auger cast piles and micropiles which are not covered on this course.

First of all, before any pile construction begins, the Contractor prepares a Pile Installation Plan (PIP) and submits it to the Department for review.

Then, the Test Pile program is performed to determine if the proposed equipment will work and to determine the Authorized Pile lengths and Driving Criteria. Contractor revises Pile Installation Plan, if applicable. The Pile Installation Plan will be accepted based on field performance.

After the test pile program is performed, pile lengths are ordered and the process continues with the Driving of Production Piles.

When we talk about piles we talk about two types depending on the mechanics of how the load is transferred. We often talk about piles as predominantly "end bearing" or "friction" piles, all piles have some of both.

Piles designed for having their load transferred throughout the materials they are driven into are called “Friction” designed. The site subsurface soils the piles are installed into “grab” the sides of the piles, much like when you step in mud and try to pull your foot out.

Piles can be, and often are, designed for a combination of both end bearing and friction. Side friction must be overcome during driving of the piles, even in situations where the design condition includes scour and we are not necessarily counting on that soil to be present for design.

You will be seeing in the plans that the sub structural elements of the bridges are called sometimes piers and sometimes bents. What is the difference between bents and piers? In a Bent, the piles rise above the ground surface to a specified elevation. At this elevation, the piles are tied together with a bent cap.

Pier piles are pile tops that are generally at or below existing grade. At this elevation, the piles are tied together with a pile cap (footing). Then a column is constructed from the pile cap up to the required beam seat elevation, where it is finished for connection to the structure.

The following video that will introduce you to the equipment and procedures that will be covered in this class.

(play video 9.5 minutes)

This concludes Lesson 1, please continue to lesson 2 by selecting the next lesson button on this page.