ATPD-1370: PILE DRIVING ON LAND AND WATER

Cuyahoga Community College

Viewing: ATPD-1370 : Pile Driving on Land and Water

Board of Trustees:
September 2025

Academic Term:
Fall 2025

Subject Code
ATPD - Applied Ind Tech-Pile Driving

Course Number:
1370

Title:
Pile Driving on Land and Water

Catalog Description:
Introduction to basic pile types and applications. Topics include recognition and use of different types of hammers, pile families designs, structural characteristics, pile driving leads, required equipment and accessories, and pile driving on land and water.

Credit Hour(s):
2

Lecture Hour(s):
2

Requisites

Prerequisite and Corequisite
ATCT-1301 Introduction to Carpentry, and departmental approval: admission to Pile Driving Technology apprenticeship program.

Outcomes

Course Outcome(s):
Identify four basic families of pile, pile driving hammers, types of cranes, structural components of cranes and their functions.

Objective(s):
1. Identify types of cranes used and list advantages and disadvantages of each.
2. Identify structural components of cranes and their functions.

Course Outcome(s):
Set up and drive a small rectangle cell, a pile extraction, pick and loft with a water rig, predict reactions, and work safely while performing operations.

Objective(s):
1. Demonstrate knowledge in sheet driven pile by setting up and driving a small rectangle cell.
2. Demonstrate pile extraction by removing said cell with a vibro hammer.
3. Demonstrate the ability to work safely and effectively when performing operations.
4. Pick and loft different types of pile with a water rig.
5. Predict reactions of barges and floating rigs according to crane movement.
6. Explain components, materials and tools used in pile driving-water.
7. Explain components, materials, and tools used in pile driving-land.

Methods of Evaluation:

1. Quizzes
2. Exams
3. Classroom participation
4. Completion of assigned projects.

Course Content Outline:

1. Concepts
    a. Structural components and functions of crane booms
        i. hydraulic and lattice.
    b. Types f mutation styles
        i. truck and crawler.
    c. Families of pile
        i. wood
        ii. concrete
        iii. steel
        iv. composite
    d. Structural characteristics of piles
        i. bearing
        ii. friction
        iii. friction/bearing
    e. History, types and appropriate uses of hammers
        i. gravity
        ii. impact
        iii. low
        iv. high frequency vibratory/extractors
    f. Accessories of piledriving leads
        i. spotters
        ii. pile gates
        iii. lofters
        iv. telescopes
        v. auger attachment assembly
    g. Crane equipment and accessories
        i. headache balls
        ii. swivels
        iii. load blocks
        iv. tagline reels
        v. timber mats
    h. Pile equipment and accessories
        i. cushion blocks
        ii. splice systems
        iii. driving points
        iv. spray paint
        v. spreader beams
        vi. driving shoes
        vii. pile rings
    i. Hammer accessories
        i. driving caps/heads
        ii. exhaust port plugs
        iii. transport plugs
        iv. barrel lids
        v. oil/lubricants
        vi. starting fluid
    j. Work roles included in piledriving on land
        i. foreman
        ii. operator
        iii. oiler
        iv. pilebutts

v. front end man
vi. back end man
vii. rigger
viii. loftsman
ix. ropeman
x. inspector
xi. superintendent
xii. apprentice

2. Skills
   a. Crane boom assembly, rigging, handling, hoisting and rope reeving, and use of equalizers and pendants.
   b. Reading and using capacity charts to determine selection, nomenclature, chart notes, jib capacities, and liftcrane capacities.
   c. Designing retaining and column or bearing piles using sheets, lagging walls, anchors, wood, pre-cast or prestressed concrete, steel H-piles, steel pipe, and steel caisson.
   d. Creating miscellaneous pile types using concrete caisson, composite, shell, cast-in-place, or pressure injected footing and franki.
   e. Configurations and characteristics of piledriving leads including swinging, fixed, semi-fixed/sliding extended, cross sectional, box, pipe, truss, H-beam, and triangular.
   f. Creating piledriving scene including job site description, access, scope of work, foundation design, pile schedule, and equipment schedule.
   g. Mobilizing job including crane and lead assembly.
   h. Sequencing piledriving for pile unloading, rigging and lofting, and driving the pile.
   i. Creating piledriving scene on water with stiffleg and barge mounted water rigs, and cranes, turntable/pedistal mounted, and barge.
3. Issues
   a. Advantages and disadvantages of fixed, extended, semi-fixed/sliding extended, box, pipe, truss, H-beam, and triangular piledriving leads.
   b. Safety.
   c. Predit reactions of barges and floating rigs.
   d. Dealing professionally with people operating barges and floating rigs.

The Course Schedule is subject to change due to pedagogical needs, instructor discretion, parts of term, and unexpected events.

Resources for the Instructor

United Brotherhood of Carpenters. *Piledriving.* Washington D.C.: United Brotherhood of Carpenters, 2001.

Northern California Pile Drivers. *Pile Driving Technologies.* 2nd ed. Northern CA: Northern California Pile Drivers, 1990.

Munoz, Michael. *Pilebutt, Stories and Photographs about Pile Driving.* California: Munoz, Michael, 2000.

Deep Foundation Institute. *A Pile Inspector's Guide to Hammers.* 2nd ed. Hawthorne, NJ: Deep Foundation Institute, 1995.

Top of page
Key: 550