ATPD-2020: PILE DRIVING TECHNOLOGIES

Cuyahoga Community College

Viewing: ATPD-2020 : Pile Driving Technologies

Board of Trustees:
2006-05-25

Academic Term:
Spring 2019

Subject Code
ATPD - Applied Ind Tech-Pile Driving

Course Number:
2020

Title:
Pile Driving Technologies

Catalog Description:
Advanced study of set up and breakdown of various cranes and equipment types. Includes identification of crane types, hardware & hitch usage, signals, and equipment capacities.

Credit Hour(s):
2

Lecture Hour(s):
2

Requisites

Prerequisite and Corequisite
ATCT-1301 Introduction to Carpentry, and departmental approval: admission to Carpenter's apprentice program.

Outcomes

Course Outcome(s):
Identify types of cranes, determine crane capacities, and direct movement of crane using proper signals after selecting, assembling, and attaching necessary pieces, and computing necessary mathematical information.

Methods of Evaluation:

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

Course Content Outline:

1. Concepts
   a. Types of hardware attachments
      i. Shackle pin placement
      ii. Shackle on a hook
      iii. Eyebolt working load limits (WLL"s)
      iv. Turnbuckle WLL"s
   b. Types of sling attachments
      i. softeners
      ii. one sling on hook
      iii. two slings on hook
      iv. three slings on hook

   v. four slings on hook
   vi. lifting beam
   vii. spreader beam
c. Types of cranes
   i. boom truck
   ii. mobile hydraulic boom
   iii. load bearing capacity of soil
   iv. load bearing capacity of wood
   v. lattice boom cranes
   vi. fixed and slewing tower
   vii. saddle jib
   viii. front and rear pivot luffing
   ix. fixed luff
d. Load computation.
e. Proper hand and voice signals for directing rigging operations.
f. Determining center of gravity.
g. Determining friction loss.
h. Safe crane set up.
i. Crane chart usage.
j. Geometric configuration calculations.
k. Critical lift calculation.
l. Sling angle calculations.
m. Center of gravity calculations.
n. Safety procedures for wiring hardware and sling attachments.
o. Hitch configuration.

2. Skills
   a. Configuring hitches using single vertical, symmetrical and asymmetrical two-leg bridle, three-leg bridle, four-leg bridle, vertical legs and inclined legs single basket, double wrap basket, single choker, double choker, and double wrap choker.
   b. Calculating sling angle to degrees to horizontal.
   c. Calculating center of gravity including shape and weight.
   d. Using safety procedures when wiring hardware and sling attachments.
   e. Spooling and reeving wire rope on drum, transferring storage reel to drum, and fleet angle.
   f. Calculating geometric configuration of crane base including quadrant of operation, boom length, boom angle, and load radius.
   g. Demonstrating critical lift.
   h. Demonstrating hand signals for raise the load, lower the load, raise the load slowly, lower the load slowly, everything slow, stop, emergency stop, dog everything, use main hook, use auxiliary hook, move trolley, move bridge, raise the boom, lower the boom, raise the boom and hold the load.
   i. Demonstrating lattice book signals including travel, turn, move trolley, swing.
   j. Demonstrating voice signals including general signals, overhead bridge crane, mobile hydraulic telescoping boom crane and lattice crane, and tower crane.
3. Issues
   a. Safety.
   b. Maintenance of equipment.

Resources

United Brotherhood of Carpenters. *Rigging Procedures.* First ed. Northern CA: United Brotherhood of Carpenters, 2000.

Garby, R. *IPT's Crane and Rigging Training Manual.* First ed. Alberta, Canada: IPT Publishing and Training LTD, 1991.

Dickie, D. *Mobile Crane Manual.* First ed. Ontario, Canada: Construction Safety Association of Ontario, 1985.

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