Specific Competencies and Skills Tested in this Assessment:

**Orientation, Safety, and Security**
- Explain the appropriate safety dress code for a construction worker on the job site
- Explain the role safety plays in the construction crafts and describe job-site safety
- Explain the appropriate safety precautions around common job-site hazards
- Explain importance of HAZ COM requirement and MSDS
- Describe fire prevention and fire-fighting techniques
- Describe what OSHA is and what part it plays in job-site safety
- Practice safe equipment transportation on public roads and job sites
- Practice job-site safety, prevention of slip and fall and pinch-point accidents and electrocutions
- Identify the main risk and safety factors involved in trenching
- Identify blind spots on and around heavy equipment and importance to the highway inspector
- Define why it is important for all equipment to be secured after working hours

**Introduction to Plans, Specs, and Terminology**
- Describe what specifications are
- Describe what a right-of-way is
- Match terms associated with soil to the correct definitions
- Select from a list types of compacting equipment
- Name the basic soil stabilization methods
- Define terms associated with basic earth moving operations
- Layout an earthmoving operation given the basic information and general requirements
- Describe various methods for keeping construction sites well drained
- Describe erosion and sedimentation control measures

**Introduction to Good Communication Skills**
- Demonstrate how to properly fill out a job application
- Describe how to conduct yourself during a job interview
- Demonstrate how to research information for potential career
- Develop a 5-year plan for potential career and or education advancement
Heavy Equipment PA (continued)

**Introduction to Hand and Power Tools**
Describe the basic procedures for taking care of these tools
Recognize and identify some of the commonly used power tools in the construction trade

**Basic Rigging**
Identify and describe the use of slings and common rigging hardware
Describe the basic hitch configurations and their proper connections
Describe the basic load-handling safety practices
Demonstrate proper use of American National Standards Institute (ANSI) hand signals
Describe basic safety precautions taken into consideration while operating a fork lift

**Fundamentals of Service**
Demonstrate how to research technical information in service, parts and operation manuals
Describe the operation of a hand held grease gun

**Equipment Preventative Maintenance**
Recite the preventive maintenance responsibilities of the operator
Specify the basic equipment subsystems
Identify sources of engine oil contamination
List safety tips when working on a cooling system
Properly jump-start vehicles equipped with either 12-volt or 12- to 24-volt electrical systems
Explain the basic principles of hydraulics
Explain hazards associated with hydraulic systems
List safety tips when working on or around tires and rims

**Introduction to Understanding Surveying and Grades**
Identify equipment used by the operator to check stakes and grades
State the meaning of slope ratio
Calculate cuts and fills using an engineer’s rule and hand level
Define terms associated with plan reading, grade setting, and drainage

**Articulated Dump Trucks**
List all safety devices used on the articulating dump truck
Explain warning controls and their functions
Identify risks and safety factors involved in transporting and dumping articulating dump load
Demonstrate the proper pre-start and post-start check of an articulating dump truck
Identify the basic components of an articulating dump
Demonstrate positioning the truck for a safe dumping condition

**Skid Steer Loaders**
List all safety devices used on the skid steer loader
Demonstrate removing and installing the bucket and/or attachment
Excavate material to build a stockpile of material
Demonstrate load and carry operations
Demonstrate bank loading
Demonstrate proper loading techniques
Backhoe Loaders
State safety rules for operating a backhoe loader
Identify basic components of a backhoe loader
List the attachment used on backhoe loaders
Demonstrate removing and installing backhoe bucket
Excavate a trench with a level bottom
Demonstrate loading techniques with the backhoe bucket
Excavate material with loader bucket to build a pile
Demonstrate load and carry operations
Change bucket teeth
Backfill a trench with the loader and/or backhoe buckets
Demonstrate machine repositioning techniques while using the backhoe

Bulldozers
State safety rules for operating a bulldozer
Identify basic components of a bulldozer
Check and adjust track tension
Demonstrate forming a stockpile
Demonstrate cut and carry dozing
Demonstrate cutting a road into a side hill
Demonstrate moving stockpile from point “A” to point “B”
Demonstrate spreading material into 6” layers
Demonstrate slot dozing

Crawler Loaders
Identify basic components of a crawler loader
Change bucket teeth
Check and adjust track tension
Demonstrate loading from a stockpile into a dump truck
Excavate a cellar to specifications
Demonstrate cutting a road into a side hill
Demonstrate spreading material in 6” lifts or layers

Wheel Loaders
State safety rules for operating a wheel loader
Describe the accessories used on wheel loaders
Perform preventative maintenance according to manufacturer’s recommendations
Demonstrate moving and parking the machine safely
Demonstrate bank loading into dump truck
Demonstrate loading from a stockpile into a dump truck
Demonstrate forming a stockpile
Demonstrate load and carry operations
Demonstrate spreading material in 6” layer
Heavy Equipment PA (continued)

**Excavators**
State safety rules for operating an excavator
Identify the basic components of an excavator
Perform preventative maintenance according to manufacturer’s recommendations
Demonstrate the proper pre-start and post-start check of an excavator
Start the engine and demonstrate engine warm-up and shutdown procedures
Demonstrate removing, installing, and adjusting bucket
Check and adjust track tension
Demonstrate moving concrete barriers and structures
Demonstrate placing objects in specified areas with a excavator bucket within specified time limit
Demonstrate loading a dump truck
Demonstrate excavating a trench 10 feet deep, 50 feet long according to OSHA standards then backfilling
Demonstrate a counter rotational turn while holding the upper structure in 1 position
Written Assessment:

Administration Time: 3 hours
Number of Questions: 241

Areas Covered:

12% Orientation, Safety, and Security
7% Introduction to Plans, Specs, and Terminology
1% Introduction to Good Communication Skills
2% Introduction to Hand and Power Tools
5% Basic Rigging
2% Fundamentals of Service
14% Equipment Preventative Maintenance
12% Introduction to Understanding Surveying and Grades
5% Articulated Dump Trucks
4% Skid Steer Loaders
9% Backhoe Loaders
7% Bulldozers
4% Crawler Loaders
7% Wheel Loaders
9% Excavators

Sample Questions:

What is the minimum distance spoil can be placed from any trench wall?
A. 2 feet
B. 3 feet
C. 4 feet
D. 5 feet

Which tool is best suited for cutting pipe?
A. cut off saw
B. chain saw
C. reciprocating saw
D. jig saw

Relief valves protect the hydraulic system from
A. over-pressurizing
B. over-speeding
C. under-pressurizing
D. under-speeding

When dumping material on a pile, the loader should be raised
A. to full height
B. to 3/4 height
C. only as high as required
D. to 7/8 height

An excavator attachment that can be used for lifting logs is a
A. blade
B. ripper
C. grapple
D. hammer
An operator does NOT need to consider _____ when working in a right-of-way.
   A. the location of all possible utilities  
   B. traffic flow and traffic patterns  
   C. boundary lines  
   D. transport height of their machine

Which of the following should NOT be included in a resume for a job?
   A. education  
   B. career objective  
   C. type and years of work experience  
   D. political affiliation

Defective rigging components and hardware should be
   A. used  
   B. recycled  
   C. destroyed  
   D. repaired

The best source of information about an unfamiliar piece of equipment is the
   A. mechanic  
   B. operator's manual  
   C. other operators  
   D. foreman

The correct tool to establish grade of an excavation is a/an
   A. compass  
   B. auto level  
   C. square  
   D. refractometer
Performance Assessment:

Administration Time: 2 hours and 25 minutes
Number of Jobs: 5

Areas Covered:

22% Dig a Flat Bottom Trench Using a Backhoe
Participants will utilize PPE, perform a pre-operative inspection, enter the machine, travel to the work area, park and set up machine for digging, go through the digging process, and reposition and transport machine back to staging area.

11% Perform a Pre-Operational Inspection on a Skid Steer Loader; Identify Lubrication Points and Lubricate a Grease Fitting
Participants will utilize PPE, perform pre-operational inspection, identify the problem, point out 10 points for lubrication and apply grease.

16% Properly Set Up a Laser and Determine Elevations at 4 Grade Stakes Off of a Benchmark
Participants will utilize PPE, set up laser and tripod, take reading at benchmark, establish height of the instrument, obtain readings at stake locations, correctly determine cut or fill requirements and amount required, and store laser and tripod properly.

25% Back Fill Trench and Grade with a Dozer
Participants will utilize PPE, perform pre-operational inspection, enter the machine, travel to work area, park and inspect area, backfill the excavation process, grade area, transport back to staging area, and park and shut down machine.

26% Load a Haul Unit with a Wheel or Crawler Loader
Participants will utilize PPE, perform pre-operational inspection, enter the machine, travel to work area, park machine, inspect loading area, obtain a bucket of material, travel from pile to loading area, spot, load, and release haul unit, maintain loading area, transport back to staging area, and park and shut down.

Sample Job: Back Fill Trench and Grade with a Dozer

Maximum Job Time: 25 minutes

Participant Activity: The participant will perform a pre-operation inspection of the equipment and area. Backfill and grade an excavation designated by the evaluator.