
Construction Equipment Operators

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Significant Points

- Many construction equipment operators acquire their skills on the job, but formal apprenticeship programs provide more comprehensive training.
- Job opportunities are expected to be very good.
- Hourly pay is relatively high, but operators of some types of equipment cannot work in inclement weather, so total annual earnings may be reduced.

Nature of the Work

Construction equipment operators use machinery to move construction materials, earth, and other heavy materials at construction sites and mines. They operate equipment that clears and grades land to prepare it for construction of roads, buildings, and bridges. They use machines to dig trenches to lay or repair sewer and other pipelines and hoist heavy construction materials. They may even work offshore constructing oil rigs. Construction equipment operators also operate machinery that spreads asphalt and concrete on roads and other structures.

These workers also set up and inspect the equipment, make adjustments, and perform some maintenance and minor repairs. Construction equipment operators control equipment by moving levers, foot pedals, operating switches, or joysticks. Construction equipment is more complicated to use than it was in the past. For example, Global Positioning System (GPS) technology is now being used to help with grading and leveling activities.

Included in the construction equipment operator occupation are paving, surfacing, and tamping equipment operators; pile-driver operators; and operating engineers. *Paving and surfacing equipment operators* use levers and other controls to operate machines that spread and level asphalt or spread and smooth concrete for roadways or other structures. *Asphalt paving machine operators* turn valves to regulate the temperature and flow of asphalt onto the roadbed. They must take care that the machine distributes the paving material evenly and without voids, and make sure that there is a constant flow of asphalt going into the hopper. *Concrete paving machine operators* control levers and turn handwheels to move attachments that spread, vibrate, and level wet concrete in forms. They must observe the surface of concrete to identify low spots into which workers must add concrete. They use other attachments to smooth the surface of the concrete, spray on a curing compound, and cut expansion joints. *Tamping equipment operators* operate tamping machines that compact earth and other fill materials for roadbeds or other construction sites. They also may operate machines with interchangeable hammers to cut or break up old pavement and drive guardrail posts into the earth.

Piledriver operators use large machines, mounted on skids, barges, or cranes to hammer piles into the ground. Piles are long heavy beams of wood or steel driven into the ground to support retaining walls, bulkheads, bridges, piers, or building foundations. Some piledriver operators work on offshore oil rigs. Piledriver operators move hand and foot levers and turn

valves to activate, position, and control the pile-driving equipment.

Operating engineers and other construction equipment operators use one or several types of power construction equipment. They may operate excavation and loading machines equipped with scoops, shovels, or buckets that dig sand, gravel, earth, or similar materials and load it into trucks or onto conveyors. In addition to the familiar bulldozers, they operate trench excavators, road graders, and similar equipment. Sometimes, they may drive and control industrial trucks or tractors equipped with forklifts or booms for lifting materials or with hitches for pulling trailers. They also may operate and maintain air compressors, pumps, and other power equipment at construction sites. Construction equipment operators who are classified as operating engineers are capable of operating several different types of construction equipment.

Work environment. Construction equipment operators work outdoors, in nearly every type of climate and weather condition, although in many areas of the country, some types of construction operations must be suspended in winter. Bulldozers, scrapers, and especially tampers and piledrivers are noisy and shake or jolt the operator. Operating heavy construction equipment can be dangerous. As with most machinery, accidents generally can be avoided by observing proper operating procedures and safety practices. Construction equipment operators are cold in the winter and hot in the summer and often get dirty, greasy, muddy, or dusty. Some operators work in remote locations on large construction projects, such as highways and dams, or in factory or mining operations.

Operators may have irregular hours because work on some construction projects continues around the clock or must be performed late at night or early in the morning.

Training, Other Qualifications, and Advancement

Construction equipment operators usually learn their skills on the job, but formal apprenticeship programs provide more comprehensive training.

Education and training. Employers of construction equipment operators generally prefer to hire high school graduates, although some employers may train non-graduates to operate some types of equipment. High school courses in automobile mechanics are helpful because workers may perform maintenance



Piledriver operators use large machines to hammer piles into the ground.

Projections data from the National Employment Matrix

Occupational Title	SOC Code	Employment, 2006	Projected employment, 2016	Change, 2006-16	
				Number	Percent
Construction equipment operators	47-2070	494,000	536,000	42,000	8
Paving, surfacing, and tamping equipment operators	47-2071	64,000	70,000	5,800	9
Pile-driver operators.....	47-2072	5,600	6,000	500	8
Operating engineers and other construction equipment operators	47-2073	424,000	460,000	35,000	8

NOTE: Data in this table are rounded. See the discussion of the employment projections table in the *Handbook* introductory chapter on *Occupational Information Included in the Handbook*.

nance on their machines. Also useful are courses in science and mechanical drawing.

On the job, workers may start by operating light equipment under the guidance of an experienced operator. Later, they may operate heavier equipment, such as bulldozers and cranes. Technologically advanced construction equipment with computerized controls and improved hydraulics and electronics requires more skill to operate. Operators of such equipment may need more training and some understanding of electronics.

It is generally accepted that formal training provides more comprehensive skills. Some construction equipment operators train in formal operating engineer apprenticeship programs administered by union-management committees of the International Union of Operating Engineers and the Associated General Contractors of America. Because apprentices learn to operate a wider variety of machines than do other beginners, they usually have better job opportunities. Apprenticeship programs consist of at least 3 years, or 6,000 hours, of paid on-the-job training together with and 144 hours of related classroom instruction each year.

Private vocational schools offer instruction in the operation of certain types of construction equipment. Completion of such programs may help a person get a job. However, people considering such training should check the school's reputation among employers in the area and find out if the school offers the opportunity to work on actual machines in realistic situations. A large amount of information can be learned in classrooms. But to become a skilled construction equipment operator, a worker needs to actually perform the various tasks. The best training facilities have equipment on-site so that students can do the tasks that they are learning about.

Licensure. Construction equipment operators often obtain a commercial driver's license so that they can haul their equipment to the various job sites. Commercial driver's licenses are issued by States according to each State's rules and regulations. (See the statement on truck drivers and driver/sales workers elsewhere in the *Handbook* for more information on commercial driver's licenses.)

Certification and other qualifications. Mechanical aptitude and experience operating related mobile equipment, such as farm tractors or heavy equipment, in the Armed Forces or elsewhere is an asset. Operators need to be in good physical condition and have a good sense of balance, the ability to judge distance, and eye-hand-foot coordination. Some operator positions require the ability to work at heights.

Certification or training in the right school will allow a worker to have opportunities across the country. While at-

tending some vocational schools, operators are able to qualify for or attain various certifications. These certifications prove to potential employers that an operator is able to handle specific types of equipment. Certifications last from 3 to 5 years and must be renewed.

Advancement. Construction equipment operators can advance to become supervisors. Some operators choose to teach in training facilities to pass on their knowledge. Other operators start their own contracting businesses although this may be difficult because of high start-up costs.

Employment

Construction equipment operators held about 494,000 jobs in 2006. Jobs were found in every section of the country and were distributed among various types of operators as follows:

Operating engineers and other construction equipment operators	424,000
Paving, surfacing, and tamping equipment operators	64,000
Pile-driver operators	5,600

About 63 percent of construction equipment operators worked in the construction industry. Many equipment operators worked in heavy construction, building highways, bridges, or railroads. About 17 percent of construction equipment operators worked in State and local government. Others—mostly grader, bulldozer, and scraper operators—worked in mining. Some also worked for manufacturing or utility companies. About 5 percent of construction equipment operators were self-employed.

Job Outlook

Average job growth, reflecting increased demand for their services, and the need to replace workers who leave the occupation should result in very good job opportunities for construction equipment operators.

Employment change. Employment of construction equipment operators is expected to increase 8 percent between 2006 and 2016, about as fast as the average for all occupations. Even though improvements in equipment are expected to continue to raise worker productivity and to moderate the demand for new workers somewhat, employment is expected to increase because population and business growth will create a need for new houses, industrial facilities, schools, hospitals, offices, and other structures.

Specifically, more paving, surfacing, and tamping equipment operators will be needed as a result of expected growth in highway, bridge, and street construction. There has been

consistent Congressional support for road projects. Bridge construction is expected to increase most because bridges will need to be repaired or replaced before they become unsafe. In some areas, deteriorating highway conditions also will spur demand for highway maintenance and repair.

More piledriver operators will be needed as construction continues to move into areas that are challenging to build in and require the use of piles as supports. Increases in bridge construction will also create demand for piledriver operators.

Demand for operating engineers and other construction equipment operators will be driven by the demand for new construction. Increases in pipeline construction will also create demand. These operators work in all sectors of construction.

Job prospects. Job opportunities for construction equipment operators are expected to be very good. Some potential workers may choose not to enter training programs because they prefer work that has more comfortable working conditions and is less seasonal in nature. This reluctance makes it easier for willing workers to get operator jobs.

In addition, many job openings will arise from job growth and from the need to replace experienced construction equipment operators who transfer to other occupations, retire, or leave the job for other reasons. Construction equipment operators who can use a large variety of equipment will have the best prospects. Operators with pipeline experience will have especially good opportunities.

Employment of construction equipment operators, like that of many other construction workers, is sensitive to the fluctuations in the economy. Workers in these trades may experience periods of unemployment when the overall level of construction falls. On the other hand, shortages of these workers may occur in some areas during peak periods of building activity.

Earnings

Earnings for construction equipment operators vary. In May 2006, median hourly earnings of wage and salary operating engineers and other construction equipment operators were \$17.74. The middle 50 percent earned between \$13.89 and \$23.98. The lowest 10 percent earned less than \$11.54, and the highest 10 percent earned more than \$30.83. Median hourly earnings in the industries employing the largest numbers of operating engineers were:

Highway, street, and bridge construction.....	\$19.88
Utility system construction	18.62
Other specialty trade contractors	18.00
Other heavy and civil engineering construction.....	17.63
Local government	15.95

Median hourly earnings of wage and salary paving, surfacing, and tamping equipment operators were \$15.05 in May 2006. The middle 50 percent earned between \$11.98 and \$19.71. The lowest 10 percent earned less than \$9.97, and the highest 10 percent earned more than \$25.30. Median hourly earnings in the industries employing the largest numbers of paving, surfacing, and tamping equipment operators in were as follows:

Other specialty trade contractors	\$15.26
Highway, street, and bridge construction.....	15.11
Local government	14.86

In May 2006, median hourly earnings of wage and salary piledriver operators were \$22.20. The middle 50 percent earned between \$16.31 and \$31.65. The lowest 10 percent earned less than \$12.83, and the highest 10 percent earned more than \$37.28. Median hourly earnings in the industries employing the largest numbers of pile driver operators were as follows:

Other heavy and civil engineering construction.....	\$28.60
Highway, street, and bridge construction.....	22.50
Other specialty trade contractors	20.60
Utility system construction	18.62

Hourly pay is relatively high, particularly in large metropolitan areas. However, annual earnings of some workers may be lower than hourly rates would indicate because work time may be limited by bad weather. About 28 percent of construction equipment operators belong to a union.

Related Occupations

Other workers who operate mechanical equipment include agricultural equipment operators; truck drivers, heavy and tractor trailer; logging equipment operators; and a variety of material moving occupations.

Sources of Additional Information

For further information about apprenticeships or work opportunities for construction equipment operators, contact a local of the International Union of Operating Engineers, a local apprenticeship committee, or the nearest office of the State apprenticeship agency or employment service. You can also find information on the registered apprenticeship system with links to State apprenticeship programs on the U.S. Department of Labor’s Web site: http://www.doleta.gov/atels_bat Apprenticeship information is also available from the U.S. Department of Labor’s toll free helpline: (877) 872-5627.

For general information about the work of construction equipment operators, contact:

- Associated General Contractors of America, 2300 Wilson Blvd., Suite 400, Arlington, VA 22201. Internet: <http://www.agc.org>
- International Union of Operating Engineers, 1125 17th St. NW., Washington, DC 20036. Internet: <http://www.iuoe.org>
- National Center for Construction Education and Research, P.O. Box 141104, Gainesville, FL 32614-1104. Internet: <http://www.nccer.org>
- Pile Driving Contractors Association, P.O. Box 66208, Orange Park, FL 32065. Internet: <http://www.piledrivers.org>

For general information on apprenticeships and how to get them, see the *Occupational Outlook Quarterly* article “Apprenticeships: Career training, credentials—and a paycheck in your pocket,” online at <http://www.bls.gov/opub/ooq/2002/summer/art01.pdf> and in print at many libraries and career centers.