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Construction Equipment Operators

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Significant Points

- Most construction equipment operators acquire their skills on the job, but formal apprenticeship programs provide more comprehensive training.
- Job opportunities are expected to be good, despite slower-than-average employment growth.
- Hourly pay is relatively high but, because construction equipment operators cannot work in inclement weather, total earnings may be reduced.

Nature of the Work

Construction equipment operators use machinery to move construction materials, earth, and other heavy materials and to apply asphalt and concrete to roads and other structures. Operators control equipment by moving levers or foot pedals, operating switches, or turning dials. The operation of much of this equipment is becoming more complex as a result of computerized controls. Construction equipment operators may also set up and inspect equipment, make adjustments, and perform minor repairs.

Construction equipment operators include operating engineers and other construction equipment operators; paving, surfacing, and tamping equipment operators; and pile driver operators. *Operating engineers and other construction equipment operators* operate 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 a forklift or boom for lifting materials, or 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 have the capability of operating several different types of construction equipment.

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* move levers and turn handwheels to lower an attachment that spreads, vibrates, and levels wet concrete within forms. They must observe the surface of concrete to identify low spots into which workers must add concrete. They use other attachments to the machine 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. They also



Air hammer operators use machines with interchangeable hammers to cut or break up old pavement.

may operate machines with interchangeable hammers to cut or break up old pavement and drive guardrail posts into the earth.

Pile driver operators operate pile drivers—large machines mounted on skids, barges, or cranes, which hammer piles into the ground. Piles are long heavy beams of wood or steel that are driven into the ground to support retaining walls, bulkheads, bridges, piers, or building foundations. Some pile driver operators work on off-shore oil rigs. Pile driver operators move hand and foot levers and turn valves to activate, position, and control the pile-driving equipment.

Working Conditions

Many construction equipment operators work outdoors, in nearly every type of climate and weather condition. Some machines, including bulldozers, scrapers, and especially tampers and pile drivers, 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 can expect to be cold in the winter and hot in the summer, and often get dirty, greasy, muddy, or dusty.

Operators may have irregular hours because work on some construction projects continues around the clock. Some operators work in remote locations on large construction projects, such as highways and dams, or in factory or mining operations.

Employment

Construction equipment operators held about 416,000 jobs in 2000. 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	357,000
Paving, surfacing, and tamping equipment operators	55,000
Pile-driver operators	4,400

About 3 out of every 5 construction equipment operators worked in the construction industry. Many equipment operators worked in heavy construction, building highways, bridges, or railroads. About 81,000 of all construction equipment operators worked in State and local government. Others—mostly grader, bulldozer, and scraper operators—worked in mining. Some also worked in manufacturing and for utility companies. About 1 in 20 construction equipment operators were self-employed.

Training, Other Qualifications, and Advancement

Construction equipment operators usually learn their skills on the job. However, it is generally accepted that formal training provides more comprehensive skills. Some construction equipment operators train in formal 3-year 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 on-the-job training and 144 hours a year of related classroom instruction.

Employers of construction equipment operators generally prefer to hire high school graduates, although some employers may train persons having less education to operate some types of equipment. The more technologically advanced construction equipment has computerized controls and improved hydraulics and electronics, requiring more skill to operate than previously was necessary. Operators of such equipment may need more training and some understanding of electronics. Mechanical aptitude and high school training in automobile mechanics are helpful because workers may perform some maintenance on their machines. Also, high school courses in science and mechanical drawing are useful. Experience operating related mobile equipment, such as farm tractors or heavy equipment, in the Armed Forces or elsewhere is an asset.

Private vocational schools offer instruction in the operation of certain types of construction equipment. Completion of such a program may help a person get a job as a trainee or apprentice. However, persons considering such training should check the reputation of the school among employers in the area.

Beginning construction equipment operators handle light equipment under the guidance of an experienced operator. Later, they may operate heavier equipment such as bulldozers and cranes. 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.

Job Outlook

Job opportunities for construction equipment operators are expected to be good through 2010—due, in part, to the shortage of adequate training programs. In addition, many potential workers may prefer work that is less strenuous and has more comfortable working conditions. Well-trained workers will have especially favorable opportunities.

Employment of construction equipment operators is expected to increase more slowly than the average for all occupations through

the year 2010 because equipment improvements are expected to continue to raise worker productivity and to moderate demand for skilled construction equipment operators. Employment is expected to increase as population and business growth create a need for new houses, industrial facilities, schools, hospitals, offices, and other structures. Also stimulating demand is the expected growth in highway, bridge, and street construction. Bridge construction is expected to grow the fastest, due to the need to repair or replace structures before they become unsafe. Poor highway conditions also will spur demand for highway maintenance and repair. In the last several years, Congress has passed substantial public works bills designed to provide money for such construction projects, including mass transit systems. In addition to employment growth in this occupation, many job openings will arise because of the need to replace experienced workers who transfer to other occupations or leave the labor force.

Employment of construction equipment operators is sensitive to fluctuations in the economy. Workers may experience periods of unemployment when the level of construction activity falls.

Earnings

Earnings for construction equipment operators vary. In 2000, median hourly earnings of operating engineers and other construction equipment operators were \$15.99. The middle 50 percent earned between \$12.21 and \$21.68. The lowest 10 percent earned less than \$10.00, and the highest 10 percent earned more than \$27.29. Median hourly earnings in the industries employing the largest numbers of operating engineers in 2000 were:

Highway and street construction	\$18.68
Miscellaneous special trade contractors	16.68
Heavy construction, except highway	16.63
Local government	13.95
State government	12.83

Median hourly earnings of paving, surfacing, and tamping equipment operators were \$12.88 in 2000. The middle 50 percent earned between \$10.04 and \$17.57. The lowest 10 percent earned less than \$8.51, and the highest 10 percent earned more than \$23.57. Median hourly earnings in the industries employing the largest numbers of paving, surfacing, and tamping equipment operators in 2000 were:

Highway and street construction	\$13.45
Concrete work	12.91
Local government	12.57

In 2000, median hourly earnings of pile driver operators were \$19.85. The middle 50 percent earned between \$13.36 and \$26.03. The lowest 10 percent earned less than \$10.99, and the highest 10 percent earned more than \$31.04.

Pay scales generally are higher in metropolitan areas. Annual earnings of some workers may be lower than hourly rates would indicate because worktime may be limited by bad weather.

Related Occupations

Other workers who operate heavy mechanical equipment include bus drivers; truck drivers and driver/sales workers; farmers, ranchers, and agricultural managers; agricultural workers; and forest, conservation, and logging workers.

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

► National Center for Construction Education and Research, University of Florida, P.O. Box 141104, Gainesville, FL 32614-1104. Internet:

<http://www.nccer.org>

► Associated General Contractors of America, 333 John Carlyle St., Suite 200, Alexandria, VA 22314. Internet: <http://www.agc.org>

► International Union of Operating Engineers, 1125 17th St. NW., Washington, DC 20036. Internet: <http://www.iuoe.org>

Construction Laborers

(O*NET 47-2061.00)

Significant Points

- Job opportunities should be good.
- The work can be physically demanding and sometimes dangerous.
- Most construction laborers learn through informal on-the-job training; some complete formal apprenticeship programs.

Nature of the Work

Construction laborers perform a wide range of physically demanding tasks involving building and highway construction, tunnel and shaft excavation, hazardous waste removal, and demolition. Although the term “laborer” implies work that requires relatively low skill or training, many tasks that these workers perform require a fairly high level of training and experience. Construction laborers clean and prepare construction sites to eliminate possible hazards, dig trenches, mix and place concrete, and set braces to support the sides of excavations. They load, unload, identify, and distribute building materials to the appropriate location according to project plans and specifications on building construction projects. They also tend machines; for example, they may mix concrete using a portable mixer or tend a machine that pumps concrete, grout, cement, sand, plaster, or stucco through a spray gun for application to ceilings and walls. Construction laborers may sometimes help other craft workers including carpenters, plasterers, and masons.

At heavy and highway construction sites, construction laborers clear and prepare highway work zones and rights of way; install traffic barricades, cones, and markers; and control traffic passing near, in, and around work zones. They also install sewer, water, and storm drain pipes, build manholes, and lay cement and asphalt on roads.

At hazardous waste removal sites, construction laborers prepare the site and safely remove asbestos, lead, radioactive waste, and other hazardous materials. They operate, read, and maintain air monitoring and other sampling devices in confined and/or hazardous environments. They also safely sample, identify, handle, pack, and transport hazardous and/or radioactive materials and clean and decontaminate equipment, buildings, and enclosed structures. Other highly specialized tasks include operating laser guidance equipment to place pipes, operating air and pneumatic drills, and transporting and setting explosives for tunnel, shaft, and road construction.

Construction laborers operate a variety of equipment including pavement breakers; jackhammers; earth tampers; concrete, mortar, and plaster mixers; electric and hydraulic boring machines; torches; small mechanical hoists; laser beam equipment; and surveying and measuring equipment. They operate pipe-laying machinery and use



Construction laborers do much of the physically demanding labor at construction sites.

computers and other high-tech input devices to control robotic pipe cutters and cleaners. To perform their jobs effectively, construction laborers must be familiar with the duties of other craft workers and with the materials, tools, and machinery they use.

Construction laborers often work as part of a team with other skilled craft workers, jointly carrying out assigned construction tasks. At other times, construction laborers may work alone, reading and interpreting instructions, plans, and specifications with little or no supervision.

While most construction laborers tend to specialize in a type of construction such as highway or tunnel construction, they are skilled generalists who perform many different tasks during all stages of construction. However, construction laborers who work in underground construction (such as in tunnels) or in demolition are more likely to specialize in only those areas.

Working Conditions

Most laborers do physically demanding work. They may lift and carry heavy objects, and stoop, kneel, crouch, or crawl in awkward positions. Some work at great heights, or outdoors in all weather conditions. Some jobs expose workers to harmful materials or chemicals, fumes, odors, loud noise, or dangerous machinery. To avoid injury, workers in these jobs wear safety clothing, such as gloves, hard hats, protective chemical suits, and devices to protect their eyes, respiratory system, or hearing. While working in underground construction, construction laborers must be especially alert to safely follow procedures and must deal with a variety of hazards.

Construction laborers generally work 8-hour shifts, although longer shifts also are common. They may work only during certain seasons, when the weather permits construction activity.

Employment

Construction laborers held about 791,000 jobs in 2000. They worked throughout the country but, like the general population, are concentrated in metropolitan areas. Almost all construction laborers work in the construction industry and almost 38 percent work for special trade contractors. Only about 8 percent worked part time in 2000.

Training, Other Qualifications, and Advancement

For some construction laborer jobs, employers hire people without experience or specific training in the occupation. However, the work requires more strength and stamina than most occupations, as