
Civil Engineers

(O*NET 17-2051.00)

Nature of the Work

Civil engineers design and supervise the construction of roads, buildings, airports, tunnels, dams, bridges, and water supply and sewage systems. Civil engineering, considered one of the oldest engineering disciplines, encompasses many specialties. The major specialties within civil engineering are structural, water resources, environmental, construction, transportation, and geotechnical engineering.

Many civil engineers hold supervisory or administrative positions, from supervisor of a construction site to city engineer. Others may work in design, construction, research, and teaching.

Employment

Civil engineers held about 232,000 jobs in 2000. A little over half were employed by firms providing engineering consulting services, primarily developing designs for new construction projects. Almost one third of the jobs were in Federal, State, and local government agencies. The construction and manufacturing industries accounted for most of the remaining employment. About 12,000 civil engineers were self-employed, many as consultants.

Civil engineers usually work near major industrial and commercial centers, often at construction sites. Some projects are situated



Civil engineers check on construction sites and monitor progress.

in remote areas or in foreign countries. In some jobs, civil engineers move from place to place to work on different projects.

Job Outlook

Employment of civil engineers is expected to increase about as fast as the average for all occupations through 2010. Spurred by general population growth and an expanding economy, more civil engineers will be needed to design and construct higher capacity transportation, water supply, pollution control systems, and large buildings and building complexes. They also will be needed to repair or replace existing roads, bridges, and other public structures. There may be additional opportunities within noncivil engineering firms, such as management consulting or computer services firms. In addition to job growth, openings will result from the need to replace civil engineers that transfer to other occupations or leave the labor force.

Because construction and related industries—including those providing design services—employ many civil engineers, employment opportunities will vary by geographic area and may decrease during economic slowdowns, when construction often is curtailed.

Earnings

Median annual earnings of civil engineers were \$55,740 in 2000. The middle 50 percent earned between \$45,150 and \$69,470. The lowest 10 percent earned less than \$37,430, and the highest 10 percent earned more than \$86,000. Median annual earnings in the industries employing the largest numbers of civil engineers in 2000 were:

Federal Government	\$63,530
Heavy construction, except highway	62,010
Local government	56,830
State government	54,630
Engineering and architectural services	54,550

According to a 2001 salary survey by the National Association of Colleges and Employers, bachelor's degree candidates in civil engineering received starting offers averaging \$40,616 a year, master's degree candidates received an average offer of \$44,080, and Ph.D. candidates were offered \$62,280 as an initial salary.

Sources of Additional Information

Further information about civil engineers can be obtained from:

- American Society of Civil Engineers, 1801 Alexander Bell Dr., Reston, VA 20191-4400. Internet: <http://www.asce.org>

(See introduction to the section on engineers for information on working conditions, training requirements, and other sources of additional information.)

Computer Hardware Engineers

(O*NET 17-2061.00)

Nature of the Work

Computer hardware engineers research, design, develop, and test computer hardware and supervise its manufacture and installation. Hardware refers to computer chips, circuit boards, computer systems, and related equipment such as keyboards, modems, and printers. (Computer software engineers—often simply called computer engineers—design and develop the software systems that control computers. These workers are covered elsewhere in the *Handbook*.) The work of computer hardware engineers is very similar to that of electronics engineers, but unlike electronics engineers, computer hardware engineers work with computers and computer-related