

## OCCUPATIONAL OUTLOOK HANDBOOK

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## Civil Engineers

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## What Civil Engineers Do

About this section

Civil engineers design, construct, supervise, operate, and maintain large construction projects and systems, including roads, buildings, airports, tunnels, dams, bridges, and systems for water supply and sewage treatment. Many civil engineers work in design, construction, research, and education.

### Duties

Civil engineers typically do the following:

- Analyze survey reports, maps, and other data to plan projects
- Consider construction costs, government regulations, potential environmental hazards, and other factors in planning stages and risk analysis
- Compile and submit permit applications to local, state, and federal agencies verifying that projects comply with various regulations
- Perform or oversee soil testing to determine the adequacy and strength of foundations
- Test building materials, such as concrete, asphalt, or steel, for use in particular projects
- Provide cost estimates for materials, equipment, or labor to determine a project's economic feasibility
- Use design software to plan and design transportation systems, hydraulic systems, and structures in line with industry and government standards
- Perform or oversee, surveying operations to establish reference points, grades, and elevations to guide construction
- Present their findings to the public on topics such as bid proposals, environmental impact statements, or property descriptions
- Manage the repair, maintenance, and replacement of public and private infrastructure



Civil engineers design major transportation projects.

Many civil engineers hold supervisory or administrative positions ranging from supervisor of a construction site to city engineer. Others work in design, construction, research, and teaching. Civil engineers work with others on projects and may be assisted by [civil engineering technicians](#).

The federal government employs civil engineers to do many of the same things done in private industry, except that the federally employed civil engineers may also inspect projects to be sure that they comply with regulations.

Civil engineers work on complex projects, so they usually specialize in one of several areas.

**Construction engineers** manage construction projects, ensuring that they are scheduled and built in accordance with the plans and specifications. They are typically responsible for design and safety of temporary structures used during construction.

**Geotechnical engineers** work to make sure that foundations are solid. They focus on how structures built by civil engineers, such as buildings and tunnels, interact with the earth (including soil and rock). In addition, they design and plan for slopes, retaining walls, and tunnels.

**Structural engineers** design and assess major projects, such as buildings, bridges, or dams, to ensure their strength and durability.

**Transportation engineers** plan, design, operate, and maintain everyday systems, such as streets and highways, but they also plan larger projects, such as airports, ports, mass transit systems, and harbors.

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**SUGGESTED CITATION:**

Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2014-15 Edition*, Civil Engineers, on the Internet at <http://www.bls.gov/ooh/architecture-and-engineering/civil-engineers.htm> (visited *January 08, 2015*).

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