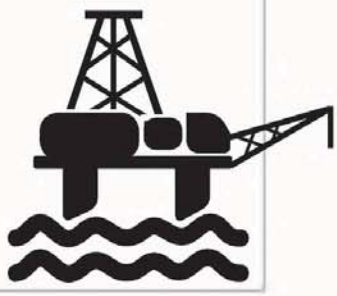
STRUCTURAL ENGINEER

JOB DESCRIPTION

Structural engineers help to design buildings and infrastructure, such as bridges, railroads, dams, and tunnels. They analyze the forces that a structure may face, such as winds, people loads, and traffic, and work with architects and civil engineers to ensure that it is built to required standards of strength and safety.



SALARY

Entry level structural engineer ★★☆☆☆
Senior structural engineer ★★★★☆

INDUSTRY PROFILE

Growing industry with opportunities across the globe • Employers range from governments to a variety of contractors and consultancies

AT A GLANCE

YOUR INTERESTS Engineering • Mathematics • Physics • Information Technology (IT) • Design • Geography • Drawing and modelmaking

ENTRY QUALIFICATIONS A degree in structural or civil engineering from an accredited program is required. Advanced degrees may be needed.

LIFESTYLE Regular office hours are the norm, although engineers may need to be on call to deal with emergencies, such as damaged or unstable buildings.

LOCATION Most engineers divide their time between an office and construction sites. They may occasionally need to travel around the country for work.

THE REALITIES Construction is one of the first sectors to be affected in an economic slump. Sites are often dusty and noisy, and can be dangerous.

RELATED CAREERS

- **CIVIL ENGINEER** *see pp. 176–177*
- **ARCHITECT** *see pp. 194–195*
- **BUILDING CONTROL OFFICER** Ensures that building regulations and other laws are followed in the design and construction of houses, offices, and other buildings. Building control officers also make sure that property alterations, such as extensions and conversions, meet all the current regulations.
- **COMPUTER-AIDED DESIGN (CAD) TECHNICIAN** Uses computer design software to create plans for buildings and machinery. CAD technicians can work in a range of industries, including construction, manufacturing, and engineering.

Demand for structural engineers is increasing, partly due to growing numbers of aging buildings.

CAREER PATHS

Qualified structural engineers often specialize in working on one type of building or material—oil platforms or concrete structures, for example. With experience, many move into managing construction projects or become consultants.

INTERN You can study for an undergraduate engineering degree on the job while working as an intern, or in a co-op program.

GRADUATE You will need an accredited degree in a subject such as civil or structural engineering to apply for jobs. Graduate training programs are available.

SKILLS GUIDE

- Good communication skills—both verbal and written—to deal with clients and prepare reports.
- The ability to use mathematical analysis to determine whether a structure can withstand loads.
- Problem-solving abilities to spot issues and propose and design solutions throughout project.
- Budgeting expertise and commercial awareness of business implications of design decisions.
- Excellent organizational skills to schedule and fulfil all stages of the planning and design process.

STRUCTURAL ENGINEER
After gaining experience in junior roles and passing your professional exams, you can practice as a qualified structural engineer. You can then choose to design a variety of buildings or bridges, or select a specialized area to work in.

FORENSIC ENGINEER
Investigates the reasons for failure or collapse of a structure in situations such as criminal damage, human error, or natural disaster.

PROJECT MANAGER
Liaises closely with all of the personnel on a construction project, ensuring that everything happens on time and to brief. A project manager may work independently or as leader of a team.

CONSERVATION AND RESTORATION ENGINEER Works on the conservation and restoration of historic buildings and structures, combining old and new construction methods.

HUMANITARIAN ENGINEER Contributes to disaster relief work in the reconstruction of infrastructure and buildings damaged by natural disasters.

SEISMIC ENGINEER
Designs buildings in earthquake-prone countries to ensure that they can cope with seismic movements in the ground in order to minimize building damage and improve safety.