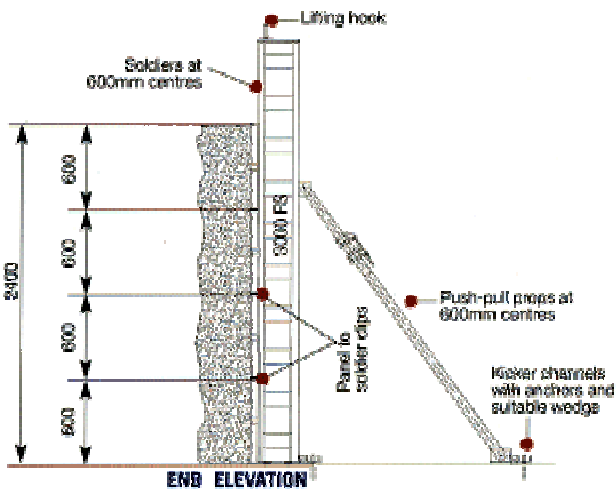


## JOB TITLE: ENGINEER

ROLES AND RESPONSIBILITY	DAILY ACTIVITIES
<p>Civil Engineers are involved in contracting, consulting, government and private companies.</p> <p>They are involved with the design, development and construction of a huge range of projects in the built and natural environment. Their role is central to ensuring the safe, timely and well-resourced completion of projects in many areas, including building structures, and facilities, such as roads, railroads, airports, bridges, harbors, channels, dams, irrigation projects, pipelines, power plants, water and sewage systems, and waste disposal units. It includes structural, traffic, oceanographic, geo-technical information technology, project management railway and harbour, transportation and water engineering.</p> <p><b>Consulting civil engineers</b> liaise with clients to plan, manage, design and supervise the construction of projects. They work in a number of different settings and, with experience, can run projects as project manager.</p> <p><b>Contracting civil engineers</b> aim to turn the plans of consulting civil engineers (designers) into reality. They oversee the actual construction on the ground and work in conjunction with consulting engineers. All civil engineers need a good understanding of design and construction processes.</p> <p>Once plans have been drawn up and approved by the client, an engineering contractor uses their professional expertise to organise human and material resources on site, and ensure the project runs to time and budget.</p>	<p>During the early stages of a career, work will involve taking responsibility for minor projects, but the size of the projects may increase as experience is gained.</p> <p>Typical work activities include:</p> <p><b>Consultants – employed by government structures, utilities, private companies</b></p> <ul style="list-style-type: none"><li>• undertaking technical and feasibility studies and site investigations;</li><li>• developing detailed designs;</li><li>• assessing the potential risks of specific projects, as well as undertaking risk management in specialist roles;</li><li>• supervising tendering procedures and putting together proposals;</li><li>• managing, supervising and visiting contractors on site and advising on civil engineering issues;</li><li>• overseeing the work of junior staff or mentoring civil engineers;</li><li>• communicating and liaising effectively with colleagues and architects, subcontractors, contracting civil engineers, consultants, co-workers and clients;</li><li>• managing budgets and other project resources;</li><li>• managing change, as the client may change their mind about the design, and identifying, formalising and notifying relevant parties of changes in the project;</li><li>• leading teams of other engineers, perhaps from other organisations or firms;</li><li>• compiling, checking and approving reports;</li></ul>



- reviewing and approving project drawings;
- using a range of design computer packages for designing projects and undertaking complex and repetitive calculations;
- scheduling material and equipment purchases and delivery;
- attending public meetings and displays to discuss projects, especially in a senior role;
- adopting all relevant requirements around issues such as building permits, environmental regulations, sanitary design, good manufacturing practices and safety on all work assignments;
- ensuring that a project runs smoothly and that the structure is completed on time and within budget;
- correcting any project deficiencies that affect production, quality and safety requirements prior to final evaluation and project reviews.

### Contracting

- liaising and working jointly with the design team (consulting engineers) to implement refinements;
- negotiating modifications with architects and consulting engineers;
- dealing skillfully with a diverse range of people including clients; architects; bricklayers; other engineering professionals; sub-contractors; members of the public;
- making judgments and solving problems;
- supervising construction;
- dealing with the logistics of supplies;
- scheduling work;
- providing appropriate plant for construction;
- monitoring the provision of materials;
- liaising with and directing the work of sub-contractors employed on the project;
- ensuring safety standards and quality of workmanship;
- finding solutions to overcome unforeseen construction difficulties;
- scheduling and adjusting each stage of the project to meet time and budget targets;
- dealing with complaints from local people experiencing disruption due to the construction works.

### QUALIFICATION PRE-REQUISITE


A four-year bachelor's degree in civil engineering is required for almost all entry-level engineering jobs.

Professional registration with the Engineering Council of South Africa (ECSA) is essential.

### CAREER DEVELOPMENT

Civil engineers can work on a variety of projects whilst gaining experience and working towards professional status. Once you have achieved professional status, you can take on further responsibilities and manage larger projects.

<p>It may be possible to enter this profession as a graduate with another degree, such as geography, or another engineering discipline, but you may be limited as to how far you can progress in your career.</p>	<p>Employers vary as to how they develop and promote engineers but, generally, graduates begin at graduate engineer level. Once professional status has been achieved, promotion to senior engineer level is possible and, with more experience, to principal engineer level.</p> <p>Contracting engineers with sufficient site experience can be given responsibility for major projects (worth million of rands). Progression is then to contracts manager or company director. Office-based career prospects also exist.</p> <p>The possibility exist for a civil engineer to specialise in one of the disciplines as set out under "roles and responsibilities"</p>
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<b>PERSONAL REQUIREMENTS</b>		<b>CHALLENGES</b>
<p>The following skills are required:</p> <ul style="list-style-type: none"> <li>• thinking both creatively and logically to resolve design and development problems;</li> <li>• technical competence;</li> <li>• numeracy skills;</li> <li>• strong communication and team working skills;</li> <li>• a flexible approach</li> <li>• report writing skills;</li> <li>• knowledge of contract law and accountancy;</li> <li>• creative flair;</li> <li>• excellent organisational skills;</li> <li>• the ability to manage resources and people.</li> </ul>		<p>Civil engineers usually work near major industrial and commercial centres, often at construction sites. Some projects are situated in remote areas or in foreign countries. In some jobs, civil engineers move from place to place to work on different projects e.g. tunneling projects</p> <p>At times, deadlines or design standards may bring extra pressure to a job. When this happens, engineers may work longer hours and experience considerable stress.</p>
<b>JOB SATISFACTION</b>	<b>ADVICE FOR JOB SEEKERS</b>	
<p>Job satisfaction for civil engineers is tremendous. Which other profession can boast of pointing at a large building or bridge and say "Look, son, I designed or built that bridge!</p> <p>It promotes teamwork and encourages you to develop and apply your skills on a variety of interesting and challenging projects. It is statutory for civil engineers to undergo continuing professional development by attending courses and other appropriate workshops, etc.</p>	<p>Compile a good CV  Network as often as you can  Get yourself an agent to obtain the position you require  Your conduct must always be exemplary – this will give you confidence  Fill in application forms neatly  Dress appropriately for an interview and speak clearly stating your case</p>	
	<b>WORKING ENVIRONMENT</b>	



The civil engineering career may involve work in many diverse settings in many different companies, from quiet, modern offices to job sites in remote/rural areas. Travel may be a frequent part of the job or even temporary relocation while working on a distant project.

Most engineers work in office buildings, laboratories, or industrial plants. Others may spend time outdoors at construction sites, mines, and oil and gas exploration and production sites, where they monitor or direct operations or solve onsite problems.

**EDUCATION AND TRAINING**

**LENGTH OF STUDY**

A BSc or BEng can be studied at any of the following universities:

- University of Cape Town
- University of the Free State
- University of KwaZulu-Natal
- University of Johannesburg
- University of Pretoria
- University of Stellenbosch
- University of the Witwatersrand

Within both these levels of entry a route exists for advancement to full registration as a professional practising Engineer.

It is important to be aware that gaining the relevant experience and skills and becoming professionally registered takes a significant length of time.

A university BSc or BEng degree (minimum of 4 years) plus 3 years Continuing Professional Development (CPD) is required before registration as a professional engineer can be obtained.