

CAREERS

#GREENCAREERSWEEK

JOB OF THE DAY



Design engineer

Salary range: starting mid to late £20k



JOB PROFILE

Design Engineers are responsible for the design of new infrastructure, buildings, roads, railways, bridges and ports, for example. They specify the nature and scale of the works, their structural form and materials. Design Engineers also get involved with maintenance, operational and extension of life work on existing assets.

SKILLS AND CAPABILITIES

Technical knowledge

The role requires detailed knowledge of computation design, material behaviours and construction techniques. Increasingly, Design Engineers must have a good understanding of sustainability in design decision-making, so that this can be considered alongside the more traditional decision points such as cost, programme and buildability. Have an interest in new designs and innovations. Knowledge of computer aided design systems (CAD) and computer aided engineering software (CAE).

Transferable skills:

- Problem reframing and resolution
- Analytical thinking: Ability to consider problems through both analytical thinking and creativity
- Effective communication of design concepts verbally, through drawings/models and written reports, Design Engineers must be articulate
- Critical thinking, to give objective analysis, evaluation and judgement on designs
- Innovating, using new methods, ideas and design concepts
- Presenting, delivering and communicating design plans with confidence
- Attention to detail and prioritising
- Influencing, and the ability to use own judgement to inform decision-making
- Critical thinking
- Planning
- Relationship development

ENTRY ROUTES

Through science, technology, engineering and mathematics (STEM) activities, many school children are exposed to design engineering from quite a young age. Many organisations offer work experience in the later stages of secondary education.

There are several routes into industry across the UK, depending on what works best for you, and your preferred learning style.

- At secondary school, you might consider studying Art or Design and Technology subjects at GCSE or A level (or equivalent level qualification)
- Given the engineering element of this role, Maths GCSE (or equivalent level qualification) is required. It is also highly recommended at A level (or equivalent level qualification)
- Bachelor's or master's level degrees are available in subjects such as civil or structural engineering.
- You could consider a T level in Design and Development for Engineering and Manufacturing. You might also consider a Higher National Certificate or Diploma
- There are a wide range of apprenticeships across the UK, available in qualifications at different levels:
- Some examples in England include Product Design and Development Engineer (degree-level apprenticeship) or Engineering Design and Draughtsperson (level 3)

HOW DOES THIS ROLE ALIGN TO THE GREEN AGENDA?

National and local government green agenda targets in areas such as net zero and biodiversity net gain are at the core of most infrastructure projects, and it often lies with the Design Engineer to make decisions to ensure that the project will meet these requirements. These decisions can include the re-use of materials to reduce carbon emissions and waste, promoting structural arrangements that enhance habitats, and create more resilient plant, animal and human societies.

Design Engineers often have a pivotal role in the maintenance, remediation and extension of the working life of infrastructure assets with the attendant benefits for the environment.

A DAY IN THE LIFE

The role of a Design Engineer can be diverse given the broad range of projects that are undertaken in the civil and structural field. Typically, the Design Engineer's involvement in a project will be staged as follows:

Option stage: investigating different approaches, materials and methodologies.

Preliminary and detailed design stages: deriving loads, sizing structural members and arrangement, defining materials, and preparing specifications.

Construction stages: the Design Engineer provides support to the construction team to address queries and emerging issues. Lesson-learned period where best practice and design data will be recorded for future reference.

Across all these stages there are opportunities for the Design Engineer to influence product sustainability through the choice of materials and methodology.

A design engineer and construction worker look at plans onsite. Designers will often interact with people beyond their own organisation, depending on their level of seniority. This can include clients such as National Highways, Network Rail, HS2 and major port/airport operators. They will also interact with construction organisations and their peers from other designers and representatives of approval authorities such as the Environment Agency.

Most organisations are now offering a degree of flexible and hybrid working with time spent both working from home and in the office. Designers at the early stage of their career are encouraged to spend much of their time in the office so they can learn from their more experienced colleagues. Part-time work is available, and most companies have returner programmes which help people to transition between part-time and full-time work.

POTENTIAL CAREER PROGRESSION

There are usually plenty of opportunities for progression as most organisations have well-structured development programmes to support staff to grow both in terms of their technical proficiency and in terms of their managerial and soft skills. There are many instances where people have been able to progress right through an organisation from trainee to senior leader over the course of their career.