

Professionals
Science and engineering professionals
Food processing and related trades workers
Engineering professionals (excluding electrotechnology)
Professional Job profile: civil engineer
ESCO link: http://data.europa.eu/esco/occupation/d7d986e1-7333-431b-9719-0c5c6939e360
Alternative labels: director of infrastructure projects, civil engineering consultant, civil engineering expert, infrastructure project manager, investments civil engineer, quality assurance civil engineer, civil engineering specialist, harbour civil engineer, civil engineering adviser
Civil engineers design, plan, and develop technical and engineering specifications for infrastructure and construction projects. They apply engineering knowledge in a vast array of projects, from the construction of infrastructure for transportation, housing projects, and luxury buildings, to the construction of natural sites. They design plans that seek to optimise materials and integrate specifications and resource allocation within the time constraints.
ISCO number: 2142
Essential
knowledge
civil engineering
engineering principles
engineering processes
mining, construction and civil engineering machinery products
technical drawings
skill/competence
adjust engineering designs
approve engineering design
ensure compliance with safety legislation
perform scientific research
use technical drawing software
Optional
knowledge
aerodynamics
air traffic management
automation technology
biology
business management principles
cartography
chemistry
chemistry of wood
construction methods
construction products
consumer protection
contamination exposure regulations
cost management
demolition techniques
design principles
electric generators
electrical discharge

electrical engineering
electrical power safety regulations
electricity consumption
energy efficiency
energy market
energy performance of buildings
environmental engineering
environmental legislation
environmental legislation in agriculture and forestry
environmental policy
fluid mechanics
geochemistry
geodesy
geographic information systems
geography
geological time scale
geology
geomatics
geophysics
green logistics
hazardous waste storage
hazardous waste treatment
hazardous waste types
impact of geological factors on mining operations
impact of meteorological phenomena on mining operations
industrial heating systems
logistics
manufacturing processes
mathematics
mechanical engineering
mechanics
meteorology
metrology
multimodal transport logistics
non-destructive testing
nuclear energy
nuclear reprocessing
paper chemistry
paper production processes
photogrammetry
pollution legislation
pollution prevention
power electronics
power engineering
project management

public health
radiation protection
radioactive contamination
regulations on substances
renewable energy technologies
safety engineering
sales strategies
soil science
solar energy
surveying
surveying methods
thermodynamics
timber products
topography
traffic engineering
transportation engineering
transportation methods
types of pulp
types of wind turbines
types of wood
types of wood materials
urban planning
urban planning law
wildlife projects
wood cuts
wood moisture content
wood products
woodworking processes
zero-energy building design
zoning codes
skill/competence
abide by regulations on banned materials
adapt energy distribution schedules
address problems critically
address public health issues
adjust surveying equipment
advise architects
advise customers on wood products
advise on building matters
advise on construction materials
advise on environmental remediation
advise on geology for mineral extraction
advise on mining environmental issues
advise on pollution prevention
advise on use of land
advise on waste management procedures

analyse energy consumption
analyse environmental data
analyse road traffic patterns
analyse transport studies
apply digital mapping
apply health and safety standards
apply safety management
assemble electrical components
assess environmental impact
assess financial viability
assess project resource needs
assess the life cycle of resources
calculate exposure to radiation
calibrate electronic instruments
calibrate precision instrument
carry out energy management of facilities
carry out environmental audits
carry out statistical forecasts
check durability of wood materials
check quality of raw materials
collect data using GPS
collect geological data
collect mapping data
collect samples for analysis
communicate on minerals issues
communicate on the environmental impact of mining
compare survey computations
compile GIS-data
conduct environmental surveys
conduct field work
conduct land surveys
conduct quality control analysis
conduct research before survey
coordinate electricity generation
create AutoCAD drawings
create GIS reports
create cadastral maps
create thematic maps
demolish selectively
demolish structures
design automation components
design scientific equipment
design strategies for nuclear emergencies
design transportation systems
design wind farm collector systems

design wind turbines
determine boundaries
develop efficiency plans for logistics operations
develop environmental policy
develop environmental remediation strategies
develop geological databases
develop hazardous waste management strategies
develop material testing procedures
develop mine rehabilitation plan
develop non-hazardous waste management strategies
develop radiation protection strategies
develop strategies for electricity contingencies
develop test procedures
distinguish wood quality
document survey operations
draft design specifications
draw blueprints
ensure compliance with environmental legislation
ensure compliance with radiation protection regulations
ensure equipment cooling
ensure material compliance
examine engineering principles
examine geochemical samples
execute analytical mathematical calculations
execute feasibility study
follow nuclear plant safety precautions
identify energy needs
identify hazards in the workplace
inform on government funding
inspect building systems
inspect compliance with hazardous waste regulations
inspect construction supplies
inspect facility sites
inspect industrial equipment
inspect wind turbines
inspect wood materials
interpret geophysical data
investigate contamination
maintain nuclear reactors
maintain photovoltaic systems
maintain records of mining operations
make electrical calculations
manage a team
manage air quality
manage budgets

manage contracts
manage engineering project
manage environmental impact
manage timber stocks
manipulate wood
meet contract specifications
monitor contractor performance
monitor electric generators
monitor nuclear power plant systems
monitor production developments
monitor radiation levels
negotiate with stakeholders
operate meteorological instruments
operate surveying instruments
oversee construction project
oversee pre-assembly operations
oversee quality control
perform laboratory tests
perform project management
perform risk analysis
perform sample testing
perform surveying calculations
plan engineering activities
plan product management
plan resource allocation
prepare geological map sections
prepare surveying report
prepare technical reports
present reports
process collected survey data
process customer requests based on the REACH Regulation 1907 2006
promote sustainable energy
provide advice to technicians
provide information on geological characteristics
provide information on geothermal heat pumps
provide information on solar panels
provide information on wind turbines
read standard blueprints
record survey measurements
record test data
report test findings
research locations for wind farms
resolve equipment malfunctions
respond to electrical power contingencies
respond to nuclear emergencies

review meteorological forecast data
simulate transport problems
study aerial photos
study prices of wood products
study traffic flow
supervise staff
test safety strategies
test wind turbine blades
troubleshoot
use CAD software
use a computer
use geographic information systems
use methods of logistical data analysis
use software tools for site modelling
use thermal management
value properties
wear appropriate protective gear
Future skills
Essential
Basic digital skills
Advanced data analysis
Mathematical skills
IoT
Big Data
Business Intelligence
Adaptability & adapt to change
Continuous learning
Critical thinking & decision making
Work autonomously
Active listening
Basic numeracy and communication
Basic data input and processing
Advanced literacy
Quantitative and statistical skills
Complex information processing
Complex problem solving
Problem management
Risk management
Environmental awareness
Energy efficiency
BIM methodology
3D Printing
Use of new measurement systems: drones
Resource reuse/recycling
Waste management (reduction and reuse)
Product life cycle impact assessment

Application of new technologies to civil engineering
Energy efficiency of buildings and infrastructure.
Risk management related to climate change
Sustainable waste management - Circular Economy
Sustainable resource management
Project management
Optional
Cybersecurity
Use of complex digital communication tools
Quality procedures related to digital transformation
Information Security Management
Advanced communication skills
Interpersonal skills and empathy
Leadership and managing others
Entrepreneurship and initiative taking
Teaching and training the others
Process analysis
Personal experience
Creativity
Ergonomics