

Occupational Profile

Civil Engineers



SKILLS YOU NEED

Basic Skills:

- Reading Comprehension
- Active Listening
- Writing
- Speaking
- Mathematics
- Science
- Critical Thinking
- Active Learning
- Learning Strategies
- Monitoring

Transferable Skills (applicable in other careers):

High level

- Analyzing and testing engineering plans
- Creating design concepts for structures and facilities
- Creating engineering concepts
- Designing structures and land use
- Directing an engineering design team
- Explaining charts and maps
- Giving advice on building plans and projects
- Operating computers to create engineering designs
- Operating computers to record and analyze engineering data

Workplace Skills:

High level

- Complex Problem Solving
- Coordination
- Instructing
- Judgment and Decision Making
- Persuasion

Medium level

- Equipment Selection
- Management of personnel resources
- Negotiation
- Operations Analysis
- Quality Control Analysis
- Service Orientation
- Social Perceptiveness
- Systems Analysis
- Technology Design
- Time Management
- Troubleshooting

Additional skills for this occupation may be found at <http://www.iowaworkforcedevelopment.gov/career-exploration-resources>

WHAT THEY DO

Performs engineering duties in planning, designing and overseeing construction and maintenance of building structures and facilities. May work on roads, railroads, airports, bridges, harbors, channels, dams, irrigation projects, pipelines, power plants, water and sewage systems, or waste disposal units. May be architectural, structural, traffic, ocean, geo-technical or other kind of engineer. Belongs to the Science, Technology, Engineering and Mathematics cluster and Engineering and Technology pathway.

IS THIS FOR YOU?

Work Interests are described in the following categories (compatible with Holland's Model) by people who tend to succeed in this career:

- **Conventional** – You are an "organizer". Keeping things neat and organized is important to you. You like working with charts and reports, and work well with power and authority.
- **Investigative** – You are a "thinker". When you have a problem, you like to analyze it and look at different ways to solve it. You like to work by yourself, and you don't like explaining your ideas to other people.
- **Realistic** – You are a "doer". You like physical activities and projects. You like to find the answers to problems by doing hands-on work instead of talking about solutions.

Work Values are aspects of work that are satisfying to you. The following work values are generally associated with this career.

- **Working Conditions** – It's very important to you that your work satisfies your needs in areas like salary, job security and working style preferences, such as working alone, staying busy all the time or having variety in your work tasks.
- **Independence** – It's very important to you that your work allows you to make decisions on your own. You want to try out your own ideas and work with little supervision.

Aptitudes reflect a person's ability to acquire skills and knowledge. The following aptitudes are important for success in the career:

- **General Learning Ability**
- **Verbal Aptitude**
- **Numerical Aptitude**
- **Spatial Perception**

Source: <https://secure.ihaveaplaniowa.gov/>

ESTIMATED & PROJECTED EMPLOYMENT

Occupational Title	2012 Estimated Employment	2022 Projected Employment	2012-22 Employment Change	Annual Growth Rate (%)	Total Annual Openings
Total, All Occupations	1,758,205	1,955,480	197,275	1.1	61,665
Architecture & Engineering Occupations	18,715	20,165	1,450	0.8	590
Civil Engineers	1,690	2,025	330	2.0	75

Source: <http://www.iowaworkforcedevelopment.gov/occupational-projections-0>

2015 WAGE & SALARY (\$)

Occupational Title	Average Wage	Average Salary	Entry Wage	Entry Salary	Experienced Wage	Experienced Salary
Total, All Occupations	19.77	41,122	9.55	19,858	24.88	51,755
Architecture & Engineering Occupations	32.37	67,338	20.81	43,279	38.16	79,368
Civil Engineers	37.20	77,369	24.67	51,311	43.46	90,397

Source: <http://www.iowaworkforcedevelopment.gov/occupational-projections-0>

EDUCATION & TRAINING

Education	Work Experience	Job Training
Bachelor's Degree	None	None

A bachelor's degree in engineering is required for almost all entry-level engineering jobs. College graduates with a degree in a natural science or mathematics occasionally may qualify for some engineering jobs, especially in specialties in high demand. Graduate training is essential for engineering faculty positions and many research and development programs, but is not required for the majority of entry-level engineering jobs. All 50 states and the District of Columbia require licensure for engineers who offer their services directly to the public. Engineers who are licensed are called professional engineers (PE). This licensure generally requires a degree from an ABET-accredited engineering program, four years of relevant work experience and successful completion of a state examination. Iowa's Engineering and Land Surveying Examining Board at http://access.bridges.com/ext/cp/custom_state_data/iowa_licensed_occupations/17-2021.htm provides additional information.

Source: <http://www.iowaworkforcedevelopment.gov/occupational-projections-0> and <https://secure.ihaveaplaniowa.gov/>

NATIONAL CAREER READINESS CERTIFICATE (NCRC)

Skill	Median Skill Level
Applied Mathematics	n.a.
Locating Information	n.a.
Reading for Information	n.a.



This ACT-developed credential demonstrates achievement and a certain level of workplace employability skills. The greater the score, the greater the skill level (Bronze = 3, Silver = 4, Gold = 5, Platinum = 6).

Source: <http://www.act.org/workkeys/analysis/occup.html>

PRIMARY INDUSTRY SECTORS

(Where are Civil Engineers Employed?)

Professional, Scientific, & Technical
Local Government
State Government
Educational Services
Construction of Buildings
Federal Government
Heavy and Civil Engineering Construction
Utilities

Source: <http://www.iowaworkforcedevelopment.gov/occupational-projections-0>

ADDITIONAL SOURCES:

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