

# Civil Engineers



## Occupational Profile

### OVERVIEW

Perform engineering duties in planning, designing and overseeing construction and maintenance of building Structures, and facilities, such as roads, railroads, airports, bridges, harbors, channels, dams, irrigation projects, pipelines, power plants, and water and sewage systems. Belongs to the Architecture and Construction career cluster and Design/Pre-Construction career pathway.

### SKILLS & KNOWLEDGE NEEDED

#### Basic Skills:

- Reading Comprehension
- Active Listening
- Complex Problem Solving
- Mathematics
- Critical Thinking

#### Technology Skills:

- Analytical or Scientific Software
- Computer Aided Design Software
- Graphics or Photo Imaging Software
- Map Creation Software
- Project Management Software

#### Knowledge:

- Engineering and Technology
- Building and Construction
- Mathematics
- Design
- English Language

### DOES THIS DESCRIBE YOU?

**Work Interests** involve descriptive categories (compatible with Holland's Model) attributed to success in this career:

- **Conventional** – Enjoy following set procedures and routines developed through higher authority; includes working with data and details more than with ideas.
- **Investigative** – Involves working with ideas requiring an extensive amount of research, fact finding, problem solving, and thought analysis.
- **Realistic** – Involves work activities that include practical, hands-on problems and solutions; often dealing with plants, animals, and real-world materials like wood, tools, and machinery.

**Work Styles** depict worker characteristics conducive for this career:

- **Integrity**
- **Dependability**
- **Attention to Detail**
- **Analytical Thinking**
- **Initiative**

**Work Values** are associated with aspects of work that provide satisfaction in this career:

- **Working Conditions** – Job security; good working conditions.
- **Recognition**—Advancement potential.
- **Independence** – Autonomy; working on your own.

**Aptitudes** reflect an ability to acquire skills and knowledge for success in this career:

- **Deductive Reasoning**
- **Inductive Reasoning**
- **Information Ordering**
- **Oral Comprehension**
- **Oral Expression**

## ESTIMATED & PROJECTED EMPLOYMENT

Occupational Title	2014 Estimated Employment	2024 Projected Employment	2014-24 Employment Change	Annual Growth Rate (%)	Total Annual Openings
Total, All Occupations	1,795,100	1,949,240	154,140	0.9	58,145
Architecture & Engineering Occupations	19,925	21,300	1,375	0.7	625
Civil Engineers	1,725	1,955	230	1.3	75

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

## 2017 WAGE & SALARY (\$)

Occupational Title	Mean Wage	Mean Salary	Entry Wage	Entry Salary	Exp Wage	Exp Salary
Total All Occupations	20.93	43,539	10.09	20,991	26.35	54,813
Architecture & Engineering Occupations	33.39	69,442	21.12	43,934	39.52	82,195
Civil Engineers	38.16	79,368	25.12	52,252	44.68	92,926

Source: <https://www.iowaworkforcedevelopment.gov/occupational-employment-and-wages>

## EDUCATION & TRAINING

Education	Work Experience	Job Training
Bachelor's Degree	None	None

A bachelor's degree is required for engineering positions. Licenses, certificates, and/or commissions may be required. Sources: <https://www.iowaworkforcedevelopment.gov/occupational-projections>, [https://www.bls.gov/emp/ep\\_education\\_training\\_system.htm](https://www.bls.gov/emp/ep_education_training_system.htm), and <https://www.iowaworkforcedevelopment.gov/iowa-licensed-occupations>



## NATIONAL CAREER READINESS CERTIFICATE (NCRC)

Skill	Median Skill Level	Minimum Skill Level	Maximum Skill Level
Applied Mathematics	7	7	7
Locating Information	6	6	6
Reading for Information	6	6	7
Applied Technology	6	5	6
Business Writing	3	3	4
Workplace Observation	4	3	4
Listening for Understanding	3	3	4

An ACT assessment-based credential issued in determining essential work skills needed for employment success across industries and occupations. The greater the score, the greater the skill level (Bronze = 3, Silver = 4, Gold = 5, Platinum = 6 & higher). Source: <http://www.act.org/content/act/en/products-and-services/workkeys-for-employers/assessments.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: <https://www.iowaworkforcedevelopment.gov/occupational-projections>

## ADDITIONAL SOURCES:

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