Civil Engineering Tech

At a Glance

Civil engineering techs help engineers design and build all kinds of structures. Houses, stadiums, roads, and bridges-they do it all.

16 Career Clusters

Architecture & Construction

Agriculture, Food & Natural Resources

Science, Technology, Engineering & Math

Transportation, Distribution & Logistics

Earnings

Earnings Range: 27K - 67K

Level of Education

- 2-Year College or Technical Training

Core Tasks

- Use computer-aided design (CAD) software to create drawings and plans
- Write reports for engineers
- Prepare construction specifications, cost estimates, and work schedules for projects
- Research conditions at projects sites
- Supervise on-site construction work

Attributes & Abilities

- An aptitude for math and science
- Computer skills
- Practical and creative
- Detail-oriented
- Communication skills

Workplace

- Employed by construction companies, contractors, engineering consulting firms, manufacturing companies, land developers, and municipalities
- Work in offices and labs, and outdoors on construction sites
- Wear hardhats, steel-toed boots, and other safety gear on site
- Most work a 5-day, 40-hour week, but overtime is sometimes necessary

Job Description

Civil engineering techs help design and build all kinds of structures. They work on buildings, dams, and bridges. They also have a hand in designing roads, sewers, and railroads. Even landfills need a tech's guiding hand to make sure they're planned properly.

Technicians and technologists are key members of any civil engineering project. They are the link between the engineers who design and the workers who build. They convey project details from engineers to contractors. They also prepare progress reports for supervisors.

Techs work on many different things. They survey the site to make sure the project can go ahead without any problems. They do calculations to check if there's enough space and materials for the project.

Techs also create drawings and layouts for projects. Most use computer-aided design (CAD) software to do their drawings. They draw buildings, highways, airports, and other structures. They put together the specifications for the project. Some also prepare cost estimates and schedules.

Techs also study things like soil quality, water drainage, and highway systems. Once they have the data they need, they create reports. These reports help engineers do their jobs.

Techs may also check and test the building supplies. Some are in charge of the on-site work. They make sure everything meets building and safety standards. In some cases, they inspect existing structures for signs of wear and tear. They offer advice on the types of repairs that are needed.

Working Conditions

Civil engineering techs can work for a range of employers, including:

- construction companies
- contractors
- engineering consulting firms
- manufacturing companies
- land developers
- governments

Techs work both inside and outside. In offices, they work on computers. They sometimes work at drafting tables to do their designing. In labs, they test building materials. They need to make sure they meet certain standards.

Techs also travel to work sites. Here, they check out the site and do any tests they need to. Some techs supervise the work that is going on.

Work sites can be hazardous. For example, techs may need to climb ladders to access parts of a site. They risk injury if they fall. Techs need to wear safety gear while they are at a site. Hard hats, steel-toed boots, and other safety gear help reduce injuries.

Techs usually work 40 hours a week. They may have to work some overtime. They may also have to live away from home during long projects.

Earnings

Most civil engineering techs work full time. Some work on a contract or seasonal basis.

Most techs earn between $31,000 and $78,000 a year. The median salary is about $50,000 a year. Managers and those with special skills earn the most.

Salaries for techs vary depending on their education and role. A technologist usually earns more than a technician. Earnings also depend on employer and experience. Some senior-level techs can make more than $100,000 a year.

Full-time techs usually get benefits. These can include health insurance, pension plans, and paid vacation and sick days.

Some techs belong to unions. This means union reps negotiate their pay and benefits on their behalf.

Massachusetts Wages

Occupation: Civil Engineering Technicians

Level of Experience	Hourly	Annual
Entry Wage	$21.2	$44,090
Median Wage	$26.74	$55,620
Experienced Wage	$38.19	$79,430

Source: U.S. Department of Labor, Bureau of Labor Statistics http://www.bls.gov

Massachusetts Outlook

Occupation: Civil Engineering Technicians

Employment

2014	800
2024	840

Change

Number	40
Percentage	5

Annual Average Openings

Total	Growth	Replacement
20	--	--

Source: Projections Central http://www.projectionscentral.com

Education

Most employers prefer techs to have training after high school. You need at least an associate degree in civil engineering technology. This degree takes 2 years to earn.

Many colleges offer bachelor's degrees in engineering technology. These programs take 4 years. With this degree, you can likely work as a technologist rather than as a technician. The extra years of study allow you to do more complex tasks.

Many 2 and 4-year colleges offer these and related programs. Some technical schools also provide training. Most programs include courses in math and science. You will also receive practical, hands-on training.

It's a good idea to enroll in an accredited program, as many employers prefer it. Talk with some employers before choosing a program.

The National Institute for Certification in Engineering Technologies (NICET) certifies techs. Certification proves that you have a certain level of skill and expertise. It may be required for some jobs. For example, it may be required if you test construction materials in your role. It can also give you an advantage in the job market.

Related College Programs

- Civil Engineering Technology/Technician
- Civil Engineering, General
- Civil Drafting and Civil Engineering CAD/CADD

Other Suggested Qualifications

Civil engineering techs need to have a strong aptitude for math and science, and should enjoy working with computers. A healthy mix of practicality and creativity is ideal. Techs must be detail-oriented and analytical, with strong written and verbal communication skills. They must be able to present the results of their work in a clear and organized manner. The ability to work well with others is also important, since they are often part of a team of engineers and other techs. Certification is available through the National Institute for Certification in Engineering Technologies (NICET). While not mandatory for most tech positions, many municipalities strongly recommend certification for those whose work involves construction materials testing. Certification may also give you a competitive advantage in the job market.

Sample High School Program of Study

This Program of Study can serve as a guide, along with other career planning materials, as learners continue on a career path. Courses listed within this plan are only recommended coursework and should be individualized to meet each learner's educational and career goals.

Engineering and Technology Science, Technology, Engineering & Math

Grade 9	Grade 10	Grade 11	Grade 12
English/Language Arts			
English/Language Arts I	English/Language Arts II	English/Language Arts III	English/Language Arts IV
Math			
Algebra I or Geometry	Geometry or Algebra II	Algebra II or Trigonometry Pre-Calculus or Statistics	Trigonometry or Pre-Calculus/Calculus or AP Calculus or Math Analysis
Science			
Biology	Chemistry	Physics	AP Science or Structured Computer Program Language
Social Studies/Sciences			
State History	U.S. History	World History	Economics

Grade 9	Grade 10	Grade 11	Grade 12
Civics		World Geography	Entrepreneurship

Career & Technical Courses

Grade 9	Grade 10	Grade 11	Grade 12
Introduction to Engineering Design	Principles of Engineering or Information Technology Applications	Product Engineering and Development Digital Electronics	Civil Engineering and Architecture Engineering Innovation

States' Career Clusters Initiative, 2008, www.careerclusters.org.

Important

- Check with your advisor to make sure that your course selections satisfy your graduation requirements.
- Courses available may vary from school to school.

Sample Career Path

People take different pathways through their careers, but no one starts at the top. This is an example of how the earnings, education and experience requirements, and responsibilities might progress for someone in this occupation.

Level 1

Sample Title	Entry-Level Civil Engineering Tech
Earnings	$29,000 to $40,000 a year
Requirements	• Associate or bachelor's degree in engineering technology
Responsibilities	Designing and drafting under the supervision of a senior tech; using CAD (computer-aided design) systems.

Level 2

Sample Title	Intermediate Civil Engineering Tech
Earnings	$40,000 to $55,000 a year
Requirements	• At least 2 years of experience • Preferably certified
Responsibilities	Designing and drafting with less supervision; using CAD systems; preparing reports; conducting on-site tests; analyzing data; preparing construction specifications and work schedules.

Level 3

Sample Title	Senior Civil Engineering Tech
Earnings	$50,000 to $70,000 a year or more
Requirements	• Several years of experience working on a wide range of projects
Responsibilities	Coordinating projects; supervising junior techs; liaising with governments, utility companies, and clients.

Related Careers

Here are some other occupations that you might be interested in. Click on an occupation name to learn more.

- Building Inspector
- Chemical Engineering Tech
- Civil Engineer
- Construction Tradesperson
- Cost Estimator
- Demolition Expert
- Drafter
- Electrical Engineering Tech
- Electronics Engineering Tech
- Environmental Technician
- Hydrologist / Hydrogeologist
- Industrial Engineering Tech
- Landscape Architect
- Mechanical Engineering Tech
- Petroleum Engineering Tech
- Planner
- Survey Tech

Career Clusters

Career Clusters are groups or families of occupations that share common characteristics such as knowledge requirements, skill sets, and/or goals.

Architecture & Construction

Agriculture, Food & Natural Resources

Science, Technology, Engineering & Math

Transportation, Distribution & Logistics

National Employment by Industry

Industry	% Employed
Government	47
Professional, Scientific, and Technical Services	45

Other Resources

American Society of Civil Engineers (ASCE)
A national trade association representing those who work in the civil engineering field. Scroll down and click on About Civil Engineering to learn more about this industry.
http://www.asce.org

TryEngineering – Engineering Technology Majors
Find helpful career and educational resources here for anyone interested in engineering technology.
http://www.tryengineering.org/become-an-engineer/engineering-technology-majors

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Science Buddies – Civil Engineering Technician
This career profile offers some great basic information about the career, key requirements, job duties, and more.
http://www.sciencebuddies.org/science-engineering-careers/engineering/civil-engineering-technician

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ABET – Explore Technical Careers
ABET accredits post-secondary programs in engineering and technology and promotes a high quality in education. Here you can discover different career options.
http://www.ecei.org/explore-technical-careers

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eGFI – Dream Up the Future
The American Society for Engineering Education (ASEE) created this website for students interested in learning more about engineering and engineering careers.
http://www.egfi-k12.org

American Society of Certified Engineering Technicians (ASCET)
This national professional society represents engineering technicians and technologists in all engineering disciplines. Visit the Regions/Chapters section to find an ASCET chapter near you.
http://www.ascet.org

Occupational Outlook Handbook – Civil Engineering Technicians
Career information from the US Department of Labor.
http://www.bls.gov/ooh/architecture-and-engineering/civil-engineering-technicians.htm