Solid Growth Foreseen For Civil Engineering

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Civil engineering may be one of the oldest engineering disciplines, but demand for the occupation continues to grow.

According to the California Employment Development Department, about one-quarter of engineering job openings in Orange County from 2008 through 2018 will be for civil engineers. With a projected job growth rate of 25.1 percent over the 10-year period, the occupation of civil engineers is expected to be the county’s 21st fastest-growing occupation among occupations employing 400 workers or more, according to the EDD. Total employment is projected to increase by 8.4 percent in the county over the same time period.

The EDD estimates that 4,850 civil engineers were employed in Orange County in 2006. From 2008 through 2018, the occupation is expected to generate 2,040 job openings in the county, including 1,220 newly created positions and 820 openings due to workers leaving the occupation or the geographic area.

The discipline of civil engineering is literally older than the pyramids, the pyramids themselves being one of the many masterpieces civil engineering. Civil engineers design and supervise the construction of public works such as roads, water-supply and sewage systems, bridges, dams, tunnels and airports.

The civil engineering profession encompasses a variety of disciplines. Structural engineers plan, design, and oversee the construction of many different types of structures, including bridges, buildings, and tunnels. Transportation engineers design and develop plans for such projects as airports, high-speed rail lines, highways, bridges and pedestrian and bicycle facilities.

Hydraulic engineers design and oversee the construction of projects relating to the control and use of water, such as canals, levees, and reservoirs, as well as flood-control, water-conservation, and soil-drainage projects. Westwater engineers design or oversee projects involving the disposal of wastewater and sewage.

Geotechnical Engineers specialize in recognizing soil types, determining soil strength for a variety of structures and analyzing how soil and underlying rock layers may affect construction. They are also concerned with how structures will withstand natural disasters, such as earthquakes or landslides.

A more recently emerging area in civil engineering is that of “green engineering.” Civil engineers are assisting in the research and design of sustainable materials used for construction or energy-efficient structures, and are also involved projects using renewable energy sources such as solar, wind, geothermal and biomass. In the transportation sector, civil engineers are developing and designing new ways to reduce the environmental impacts of various transportation projects.

The American Society of Civil Engineers notes that there are a variety of career paths civil engineers may choose to follow, including consulting, industry, construction, government, and education. The BLS estimates that about 52 percent of civil engineers work for private professional, scientific and technical service firms, such as those specializing in engineering and related services. Approximately 27 percent are employed by government agencies, 11 percent in construction and 1 percent in education.

Local job-growth projections for civil engineers reflect the national trend. The U.S. Bureau of Labor Statistics is projecting that employment of civil engineers will grow by 24 percent nationwide from 2008 through 2018. As the population continues to grow, improvements to the nation’s infrastructure will be needed. Demand will continue to grow for the design, construction and expansion of transportation, water-supply, pollution-control systems, as well as buildings and building complexes. Existing roads, bridges, and other public structures will require repair or replacement. All of these demands will generate job growth for civil engineers.

The BLS notes, however, that as construction projects are curtailed during economic slowdowns, demand for civil engineers may decrease.

According to the BLS, a bachelor’s degree is usually the minimum requirement for employment as a civil engineer, although some colleges offer two- to four-year engineering-technology degree programs. The EDD notes that civil engineers who approve engineering documents, whose work may affect the public welfare, or who oversee less experienced engineers, must also obtain a professional engineering license. The PE license must be renewed every two years.

To become licensed, engineers must first pass the Engineer-in-Training or Fundamentals of Engineering examination, which requires at least three years of coursework from a college or university offering an engineering program accredited by the Accreditation Board for Engineering and Technology, or three years of engineering-related experience. Engineers must then pass the professional examination, which requires a bachelor’s degree in engineering from an ABET-accredited institution and two years of eligible engineering experience.

Engineers without a bachelor’s degree in engineering must possess six years of eligible experience.

A variety of certificates are available for civil engineers, including Certified Measurement and Verification Professional, Certified Stormwater Manager, and Project Management. The certifications are offered by various professional organizations and can demonstrate skills and knowledge beyond the minimum required for licensure.

While graduate training is not required for the majority of entry-level engineering jobs, it is essential for engineering faculty positions and some research and development programs.

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