

## **ENGINEERING TECHNICIAN I/II/III**

### **DEFINITION**

To perform a variety of technical field and office engineering work related to surveys, materials testing, office calculations, drafting, and design.

**Engineering Technician I:** Employees in this classification receive close supervision within a framework of standard policies and procedures. Employees in this class function at the entry level.

**Engineering Technician II:** Employees in this classification receive general supervision within a framework of standard policies and procedures. Employees in this class function at the journey level and may perform more difficult engineering and paraprofessional duties.

**Engineering Technician III:** Employees in this classification receive limited supervision within a framework of standard policies and procedures. Employees in this class function at the advanced journey level and may supervise other technicians on a project basis and train subordinate engineering technicians. May provide construction management and oversight under the direction of an engineer; and to assist on a survey crew. The Engineering Technician III will also be required to increase skill levels in at least one area of engineering technology as assigned, to include one of the following: traffic technology, surveying, construction management/public works construction inspector or computer assisted drafting technology. Increased skill level may be obtained by County-sponsored course work, on-the-job training or self-instruction on the job or any combination thereof.

### **SUPERVISION RECEIVED AND EXERCISED**

Receives general direction from the County Engineer and/or County Surveyor.

May exercise lead direction over lower level classifications.

### **EXAMPLES OF ESSENTIAL FUNCTIONS**

#### **Engineering Technician I**

Learns and performs survey work that includes establishment of lines, angles, distances, and elevations for topographic, property, and construction surveys.

Learns and performs engineering and surveying calculations as required.

Learns and performs drafting as related to survey work, construction drawings, exhibits, etc.

Assists in the public works inspection process.

Learns and operates equipment on an engineering field survey party.

Under direction and supervision, develops and enters data for computerized databases.

Under direction and supervision, uses CAD/GIS software for basic mapping.

Learns and performs samples extraction and laboratory and field testing of construction materials, including use of the nuclear soils gauge.

### **Engineering Technician II**

Performs survey work using survey instruments, including total stations, GPS, and levels.

Designs, lays in, profiles and balances vertical and horizontal road realignments and/or public works projects site designs, as assigned.

Conducts maps and deeds research; plotting for right-of-way, construction or maintenance projects.

Checks grade during road or other public works construction projects.

Performs higher level duties in a training capacity.

Under supervision, uses a computer to perform a variety of survey and design-related calculations.

Under direction and supervision, prepares records, reports and legal documents.

Keeps accurate field notes and makes sketches of survey work performed.

Performs drafting utilizing CAD/GIS as related to survey and design work on public works plans, profiles, sections, details, and input GIS data.

Under supervision, prepares maps/plats utilizing CAD/GIS.

Operates electronic surveying equipment, such as total station and data collector, and performs computer input of survey data.

Responsible for assuring field vehicles, equipment and supplies are adequate for planned field tasks.

Performs field interviews and record-keeping for contract transit operators.

Assists in the oversight and management of contract transit operators and coordinates with County transit program.

Performs sample extraction and laboratory and field tests of construction materials, including soils compaction tests using nuclear soils gauge

Maintains radiation records for all users of the nuclear soils gauge.

**Engineering Technician III**

Inspects major and minor subdivision road construction for land developments for compliance with County standards and conditions of approval

Participates in and assist in survey work using a variety of survey instruments and keeping survey notes; supervises computer-aided drafting activities

Prepares drafting plans and profile sheets, “p”-line work sheets, profile work sheets, super-elevation calculations, and right-of-way plats and public works project site layout, grading plans, profile and details

Issues, inspects and oversees private and commercial encroachment permits on County and/or Zone of Benefit roads

Inspects work completed under the County Grading Ordinance and Improvement Standards

Inspects fuel modification when required on subdivision roads

Maintains accurate records and reports

Coordinate soils, laboratory and material testing with a qualified consulting firm

Supervises consultants and assists in construction materials sample extraction and complex field and laboratory tests

Under the direction of an engineer, uses a computer to perform a variety of engineering/survey-related tasks and design of public works infrastructure

Under the direction of an engineer or surveyor, uses CAD/GIS to prepare final maps and/or plats.

Prepares accurate and complex records, reports, and legal documents

Performs hydrology, hydraulic and other engineering calculations, such as the determination of culvert sizes under engineering direction

Assists with field reviews and record keeping for contract transit operators

Oversees and manages contract transit operators and coordinates with County transit program

Manages zone-of-benefit road maintenance program

Inspects pavement operations and provide construction oversight of road crew

## **EMPLOYMENT STANDARDS**

### **Knowledge of:**

#### **Engineering Technician I and II**

General mathematics (including high school algebra and geometry) and drafting

Survey and drafting procedures

Survey instrumentation and functions

Survey and design, techniques, instrumentation and functions.

The principles of algebra, geometry, and trigonometry

Computer automated surveying techniques, including total station, GPS, GIS, data collectors and computer data entry

Personal computer operating systems including CAD/GIS software, word processing and data base management

Soils and concrete material testing methods

Record and report preparation techniques

Modern office practices and technology, including the use of computers for word processing, spreadsheet preparation and database management

English usage, spelling, grammar and punctuation

#### **Engineering Technician III (in addition)**

The uses, physical characteristics, sampling and testing of construction materials including Caltrans testing methods for soils, concrete and asphalt

The principles of complex engineering computations

The methods, materials, tools, equipment, and supervision of construction engineering

Public works construction plans and specifications

Engineering plans and specifications

Principles of supervision and training

**Ability to:**

Communicate effectively in both oral and written forms

Understand and execute written and oral instructions

Establish and maintain positive work relationships with those contacted in the performance of required duties

**Engineering Technician I**

Learn the operation of surveying instruments

Under direction and supervision, learn the operation of computer software

Assist in preparation of accurate and complete notes, sketches, plans, and reports

Perform drafting work

Perform mathematical calculations quickly and accurately

**Engineering Technician II**

Operate precision surveying instruments

Prepare accurate and complete notes, sketches, plans and reports

Perform drafting work and to assist in the preparation of engineering designs

Perform mathematical calculations quickly and accurately

Operate total station, GPS, GIS, data collector, and perform computer data entry/calculations

Work with computer operation systems, CAD/GIS software, word processing, and data base software

**Engineering Technician III (in addition)**

Supervise and train others

Operate computer software including drafting and engineering design program, spreadsheet and word processing

Under engineering supervision, use a computer to design public works infrastructure

Supervise and assist in the performance of tests and analysis of construction material samples

### **TYPICAL WORKING CONDITIONS**

Work is performed in an office and field environment. Incumbent drives on surface streets and may be exposed to traffic hazards, construction and equipment hazards, air contaminants, adverse weather conditions, temperature and noise extremes, wetness, fumes, dusts, odors, skin irritants, working at heights.

### **TYPICAL PHYSICAL REQUIREMENTS**

Requires the mobility to work in an office and field environment. Requires the ability to sit at desk for long periods of time and intermittently walk, stand, climb, balance, bend, crouch, and reach while performing office duties and/or field work; traverse uneven terrain; lift and/or move light to moderately heavy weights; perform simple grasping and fine manipulation. Must be able to maintain effective audio-visual discrimination and perception needed for making observations, communicating with others, reading and writing, and operating office and specialized field equipment. Must be able to use a telephone to communicate verbally and a keyboard to communicate through written means, to review information and enter/retrieve data, to see and read characters on a computer screen.

### **MINIMUM QUALIFICATIONS**

All levels require high school graduation or a GED and possession of a valid California driver's license. Under certain circumstances, the Human Resources Director may accept a valid driver's license from another state if applicant acknowledges his/her intent to acquire a California driver's license within three months by signing an acknowledgement form.

**Engineering Technician I:** One year of experience in field engineering, land surveying, construction and/or computer drafting. One year of technical school training in the areas of land surveying, construction technology, computer-aided drafting/design or equivalent technical fields beyond the high school level may be substituted for the required experience....**or**

**Engineering Technician II:** Three years of technical engineering experience in the areas of land surveying, construction inspection, calculations/drafting of construction projects or computer-aided drafting, 2 years of which must have been in engineering or survey work comparable to an Engineering Technician I. Graduation from an accredited 2-year college with technical training in the areas of land surveying, construction technology, engineering technology, computer-aided drafting/design or equivalent may be substituted for 2 years of the above experience requirement, **OR** graduation from a 4-year college or university with major course work in civil engineering, architecture, construction management or a closely-related field....**or**

**Engineering Technician III:** Five years of experience equivalent to an Engineering Technician II or Traffic Technician II position; OR graduation from an accredited 2-year college with a minimum of 30 units of coursework in the areas of land surveying, construction technology, engineering technology, computer-aided drafting/design or equivalent technical fields and three years of experience equivalent to an Engineering Technician II or Traffic Technician II position; OR graduation from an accredited 4-year college with a degree in civil engineering or a closely-related field and 6 months of experience equivalent to an Engineering Technician II or Traffic Technician II position.

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