



ENGINEERING SPECIALIST 1

3105

GENERAL DESCRIPTION OF CLASS

The ENGINEERING SPECIALIST 1 will be assigned to work, on a crew or team led by a higher level Engineering Specialist, in one or more of the following areas: field surveying, traffic studies, field or laboratory inspection or testing, office engineering or drafting, for the planning, location, design, construction, and maintenance of facilities.

DISTINGUISHING FEATURES

This is the second level of a four-level series. This class is distinguished from the lower (Entry) level classification by being the full proficiency classification of the series. It is distinguished from the higher level by the nature of work assignments which involve assisting a higher level Engineering Specialist in conducting surveys, inspections, drafting, field and laboratory testing, and office engineering. Employees at this level require close guidance and direction in the performance of their work.

DUTIES AND RESPONSIBILITIES

The duties listed below are not inclusive but characteristic of the type and level of work associated with this class. Individual positions may do all or some combination of the duties as well as other related duties:

1. Field Surveying and Mapping

Works outdoors as a member of a survey crew in the capacity of a chain or level person, records data in field notes and project records; under close guidance, performs engineering mathematical calculations using calculators or computer programs to determine elevations, curves, angles, distances, longitudes and latitudes, earthwork volumes; modifies engineering drawings to reflect "As Constructed" information; uses conventional or computer-aided drafting; draws preliminary engineering plans; plots roadway cross sections and profiles using field survey data; performs survey computations.

2. Construction Inspection

Assists in the inspection of material for quality and quantity; compares materials with specifications to determine conformance; records quantities and characteristics of materials incorporated into the project by the contractor; assists a higher level inspector by inspection of contractors' work on a section of a construction project or projects; inputs construction data into computerized records systems.

3. Field and Laboratory Material Testing

Prepares materials for testing; obtains samples of construction materials from material suppliers or at construction site; conducts required material compaction and gradation tests; performs basic physical tests in the field or central laboratory, under general supervision, to determine quality of such materials; assists in collecting test data on existing pavements; prepares materials for further testing by higher-level Engineering Specialists.

4. Drafting

Uses conventional or computer-aided drafting equipment for the following: performs basic drafting for preliminary and final plans with guidance from other drafters, engineers, leadworkers, or supervisors; prepares base sheets by drafting on alignment, right-of-way lines, and other engineering features from location maps using pencil, ink pens or computer-aided drafting equipment; plots cross sections; plots profiles; maintains drafting equipment; performs necessary computations to develop and properly dimension project plan details.

5. Traffic Studies

Assists in field studies of traffic movements, vehicle usage and traffic distribution; assists in conducting highway inventories and road condition surveys; updates maps and reference materials; checks traffic-related materials prior to publishing.

6. Office Engineering

Records data in field notes and project records; checks field notes for accuracy; modifies engineering drawings to reflect "As Constructed" information; uses manual or computer-aided drafting equipment; drafts preliminary engineering plans; plots cross sections and profiles using field survey data; assembles and summarizes bid items; drafts specifications and other reports; computes and checks computations on photogrammetric and geometric surveys.

RELATIONSHIPS WITH OTHERS

Employees in this class have regular contact in-person with contractor's employees, the traveling public, and property owners, and periodic contact in person with employees of other units, to coordinate and obtain information. These contacts are sometimes of a controversial, sensitive, or hostile nature.

SUPERVISION RECEIVED

Employees in this classification work under the close direction of a supervisor who is responsible for assigning and reviewing work performance. Detailed instructions on work methods are provided by a higher level Specialist or a supervisor, usually in the form of verbal instructions or manuals containing specific steps to be followed. As experience is gained with repetitive tasks, the degree of instruction lessens.

GENERAL INFORMATION

Positions in this classification are located throughout the State and require the willingness to work in the environment associated with the tasks and locations. This includes physical work in rough terrain in a variety of weather conditions and working extended or irregular hours.

KNOWLEDGE AND SKILLS (KS)

Basic knowledge of:

The fundamentals of algebra, plane geometry, and trigonometry typically used in engineering technology.
Fundamental engineering principles such as physics, strength of materials, and engineering mechanics.

Skill:

To read and understand construction plans, maps, and specifications.
In oral and written communications.
In using calculators to perform mathematical and basic engineering.

Some positions may require one or more of the following:

Basic knowledge of drafting techniques.
Basic knowledge of the methods and equipment used in performing survey work.
Basic knowledge of field and/or laboratory testing procedures.
Skill in using scientific equipment to test materials.
Skill in reading and recording field and laboratory data.
Skill in measuring distances, cross section groundlines, measuring angles and directions, and running level circuits to establish elevations.
Skill in reading, writing, and analyzing survey notes.
Skill in drafting maps, details, or plans.
Skill in lettering plans and maps using pencil or pen and ink.
Skill in plotting cross sections, profiles, and typical sections.
Skill in reading, understanding, and applying survey notes to applicable engineering tasks.
Skill in computing earthwork areas, volumes, and distribution of quantities.
Skill in computing survey traverse closures and adjustments.
Skill in computing roadway profiles and elevations.
Skill in computing curve data for spiraled and circular curve alignments.
Skill in computing curve data for vertical curves.
Skill in performing routine testing functions, such as aggregate gradations.

Special Qualifications:

A valid drivers license.

NOTE: The KNOWLEDGE and SKILLS are required for initial consideration. Some duties performed by positions in this class may require different KS's. No attempt is made to describe every KS required for **all** positions in this class. Additional KS requirements will be explained on the recruiting announcement.

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