



## CIVIL ENGINEERING SPECIALIST 2

3137

### GENERAL DESCRIPTION OF CLASS

The CIVIL ENGINEERING SPECIALIST 2 coordinates construction or other projects, or works within an engineering or surveying specialty unit. They do engineering design, estimate the cost of project plans, develop specifications, inspect and test the quality of materials in the field and laboratory, administer construction contracts, survey, investigate traffic hazards, collect and analyze engineering or surveying data and plan research studies. Employees give technical expertise that requires full proficiency in a specialty engineering or surveying area not requiring registration. They frequently lead a team or coordinate work activities to manage projects, or a portion of a large project with diverse components. They also may oversee a small or portion of a large field-engineering or land surveying program.

### DISTINGUISHING FEATURES

This class is the second and journey level of a three level series. At this level employees draw upon engineering or surveying principles, recognize needs and independently develop solutions and procedures. Work situations are varied and require analytical skills to decide the applicability of standards and work practices; interpretation of guidelines change due to varying situations that are seldom repeated. Employees analyze several possible courses of action, techniques, general layouts or designs, and select the most appropriate. Work problems generally require consideration of numerous precedents and some adaptation of previous plans and techniques.

The nature of work assignments, which are more diverse and complex, requiring a higher degree of specialized engineering or surveying knowledge generally acquired through experience and training, and lesser guidance and supervision distinguishes this class from the lower level. Responsibility for assignments for which the agency or the discipline normally has established procedures, guidelines, and policies and the lack of requirement to function as an expert resource for leads, peers, and subordinates on a construction crew or in a specialty area distinguish it from the higher level.

The nature of assignment and level of responsibility distinguish this class series from the Engineering Technician class series. *Nature of Assignment:* For the Engineering Technician class series the work involves primarily the application of established practices. Employees at the highest level do minor modification and analysis for a portion of the time. The Civil Engineering Specialist has broader assignments, requiring greater skill and engineering or surveying judgment. *Level of Responsibility:* Employees in the Engineering Technician class series use available, specific and detailed, established procedures. Employees typically do not independently plan and execute projects. The Civil Engineering Specialist has the freedom to plan and execute assignments and independently coordinates the project or assigned specialty program with other individuals and groups.

The Civil Engineering Specialist class series does engineering or surveying work not requiring professional registration as an Engineer or Land Surveyor. It is distinguished from the Professional Engineer or Professional Land Surveyor series by the absence of final responsibility for design, design analysis, surveys, and prediction of the character and safety of structures which is signified by applying a professional engineer's or professional land surveyor's seal to final designs or documents; providing direction, supervision and control on technical matters of policy and design; and exercising professional judgment in engineering or surveying matters embodied in the plans, design, specifications, studies, research, or other documents involved in the work.

Some training positions within the Professional Engineer or Professional Land Surveyor series do similar work to this class series when the assignments are designed primarily to give practical experience to prepare the academically trained employees for the full range of professional work and responsibility; or there is a direct line of promotion to full professional positions in the agency.

## **DUTIES AND RESPONSIBILITIES**

The duties listed are characteristic of the type and level of work associated with this class. Individual positions may do all or some combination of the duties listed as well as other related duties.

### **1. Construction Project Administration**

Direct the work of field survey and inspection crews on complex construction projects including modernization projects and major structural projects. Coordinate and lead project meetings, partnering and preconstruction conferences, and track project schedules. Enforce contractor compliance to plans and specifications on projects. Review, identify, and initiate design changes for the contract plans. Manage project communication plans. Resolve project issues, initiate and prepare contract change orders, develop estimates for change orders, and negotiate prices with contractor. Review and analyze contractor claims and time extension requests. Monitor project engineering, surveying and construction budgets and prepare requests for increase in authorization.

Review construction contract documentation for a geographical region and recommend revisions or acceptance. Develop procedures for quality and quantity document administration.

Review designs for and inspect materials for pavement and pre-stressed concrete members, structural steel members, and structure materials.

### **2. Project Design and Development**

Gather and analyze data and prepare air quality, acoustical, hazardous materials, and energy engineering reports for construction projects. Gather and analyze data on erosion prevention and sediment control to improve storm water quality. Decide if State or Federal permits are needed for waterways or wetlands affected by construction or maintenance projects. Prepare permit applications for submittal to appropriate agency. Analyze surveys, design files, and information and produce engineering or surveying drawings of highway alignment, parks, airports, quarries, etc. with real estate property boundaries. Identify and coordinate complex utility relocations for agency and local government construction projects. Coordinate with and provide expertise and liaison with railroads and utilities when transportation projects affect their facilities. Give information and train local jurisdiction personnel on state and federal highway engineering or surveying guidelines and procedures and related specialty area topics.

### **3. Traffic and Transportation Engineering**

Lead traffic investigation studies and activities for justification and placement of transportation signals, signs, related safety improvements, and speed zone changes. Analyze traffic-engineering situations for the development of transportation improvements. Analyze traffic situations and recommend appropriate transportation improvements to solve highway safety and capacity problems. Recommend design elements such as lane widths, channelization, lane use, turning radii, taper lengths, striping, illumination, pedestrian facilities, bike facilities, etc. Gather and analyze data related to noise complaints and prepare acoustical engineering response or report for the Engineer of Record.

Oversee data collection, coding and manipulation to maintain highway data and compile annual reports required by the Federal Highway Administration such as the Oregon Certified Mileage Report.

### **4. Materials Testing**

Lead an aggregate, soils, petroleum, or physical testing materials testing crew to verify that materials comply with plans and specifications. Identify capabilities of new products for Qualified Products

Listing. Evaluate and recommend proper materials to project managers and their crewmembers. Explain testing, evaluation and sampling procedures; and clarify specification requirements to agency personnel, contractors, consultants, and federal and local government personnel.

## **5. Survey**

Lead photogrammetry field survey crew to establish and maintain statewide geodetic control, and ground control necessary for aerial photography used in the development of topographic maps and digital terrain models for highway design. Advise survey crews on surveying procedures, efficient use of electronic survey equipment and non-standard survey situations; schedule consultant surveyors to meet workload demands. Review survey work for compliance with agency policies and procedures and administrative rules.

## **RELATIONSHIP WITH OTHERS**

The Civil Engineering Specialist 2 has regular contact with other staff members, the public and contractors' representatives by telephone, letter, and in person to obtain facts, answer questions, explain processes and compliance requirements, and verify information. Employees in this class have occasional in-person or telephone contact with city, county, State and Federal agencies and with employees in other sections to exchange design, planning, project development and scheduling information.

## **SUPERVISION RECEIVED**

The Civil Engineering Specialist 2 works under the general supervision of a manager, engineer, or land surveyor. They independently decide daily methods, priorities, and activities. On new or unusual assignments they seek direction as needed. Principles and standards of engineering or surveying and clearly defined organizational policies guide the work. Work is typically reviewed upon completion for overall acceptability and to verify conformance to agency, state, and federal rules, regulations and guidelines.

## **GENERAL INFORMATION**

Positions in this class are located throughout the State and require the willingness to work under the conditions associated with the environment of the job. Some positions in the class may require the ability to climb, kneel, stoop, or walk over rough terrain when on a field inspection. Some positions are exposed to adverse environmental conditions and heavy traffic.

**KNOWLEDGE AND SKILLS (KS)****Extensive knowledge of:**

Practices, and methodologies of civil engineering or land surveying applicable to the area of assignment, such as research, planning, design, survey, construction, project development, and traffic.
Engineering or surveying software programs typical to the area of assignment.
Equipment and materials applicable to the area of assignment.
Algebra, plane geometry, and trigonometry used for doing engineering or surveying calculations in the assigned area.

**General knowledge of:**

Principles of civil engineering or land surveying applicable to the area of assignment such as research, planning, design, survey, construction, project development, and traffic.
Methods and techniques used in technical report writing.
Principles and methods of leading, training, and reviewing the work of others.
State and federal engineering or surveying guidelines, manuals and procedures typical to the area of assignment.
Methods and processes of developing construction plans and specifications.
Presentation techniques for explaining technical information to general audiences.

**Basic knowledge of:**

Principles, processes and techniques of project management.
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**Skill to:**

Compute complex engineering, surveying, mathematical, and statistical calculations in the context of one or more technical specialties.
Collect and analyze data and information and make recommendations based on principles and practices in the field of civil or traffic engineering, land surveying or transportation system planning analysis.
Communicate orally and in writing with a variety of people; answer questions; and explain technical information, regulations and decisions in an understandable manner.
Coordinate activities of assigned specialty with other departmental programs and staff.
Manage multiple tasks over extended periods.
Establish and maintain effective working relationships with internal staff, the public, contractors, and personnel from other agencies.
Train and lead lower level personnel.
Operate typical engineering or surveying computer software to analyze data.
Write clear and concise written reports.
Effectively represent the department to the public and contractors.
Identify the scope and complexity of a project and effectively and efficiently assign segments of that project to others.
Read, understand and apply specific instructions found in technical manuals, specifications, contract plans and other guidelines applicable to the job assignment.
Use tact and diplomacy to gain cooperation of others.
Assign and review the work of others to decide accuracy and adequacy of identified conditions, criteria, recommendations and supporting materials.
Identify the scope of an assigned project and decide the actions needed to meet requirements and deadlines.
Apply project management techniques and standards.

**Some positions require:****General knowledge of:**

Material testing procedures.
Practices of construction contract administration.
Practices and equipment used to construct transportation facilities.
Physical characteristics and properties of construction materials.
Techniques and methods of typical automated survey equipment and software.

**Skill to:**

Operate engineering test equipment or survey equipment.
Draft maps, details, plans or specifications using survey software, or computer-aided drafting or design software.
Interpret and record field and laboratory data.
Perform field project development and construction surveys.

**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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Revised

STATE OF OREGON  
 Dept. of Administrative Services  
 Human Resource Services Division