



ASSOCIATE IN ENGINEERING 2

3147

GENERAL DESCRIPTION OF CLASS

The ASSOCIATE IN ENGINEERING 2 applies professional engineering theory, principles and methods to a variety of office and fieldwork in the discipline of transportation or civil engineering.

DISTINGUISHING FEATURES

This is the second level of a four-level series. Employees complete moderately complex transportation related projects designed to continue training and development in specialized engineering disciplines. Employees typically have gained experience in applying professional engineering theory, principles and methods and complete assigned work without close supervision.

Employees in this classification exercise independent technical judgment in work assignments where they have experience. They decide methods, identify deficiencies in plans, and correct errors in design without first referring them to higher authority for approval. Employees carry out assignments and investigations that require resourcefulness and originality and do engineering work guided by rough sketches, general information and field measurements.

Employees at this level receive instruction or assistance from a higher-level engineer or supervisor less frequently than the Associate in Engineering 1 classification. This class is distinguished from the next higher level by the lesser degree of responsibility to define complex engineering problems and evaluate methods for their solution. Lack of designation as Engineer of Record for engineering products further distinguishes this class from the higher level.

Positions in this class may do similar assignments to positions allocated to the Civil Engineering Specialist class series. The assignments are designed primarily to give practical experience to prepare the academically trained employees for the full range of professional work and responsibility. Assignments may also overlap with the Civil Engineering class series when there is a direct line of promotion to full professional positions in the agency.

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 perform all or some combination of the duties listed below as well as other related duties.

1. Design

Design and prepare plans for moderately complex transportation facilities. Representative projects include bridges and related structures, hydraulic designs for bridges, freeway safety and complex overlay, rural and urban arterial highways, roadway design related to major bridge replacement, rehabilitation or widening, city streets or county roads, major intersection and channelization modification, pavement design, major bikeways, maintenance, emergency and other non-improvement projects, temporary traffic control, signs, illumination, intelligent transportation system designs, traffic signals, and hazmat mitigation. Make engineering decisions involving economics, structural integrity, and public safety. Prepare engineering plans, estimates, and specifications.

Review and do engineering evaluation of designs and details of minor to complex projects prepared by other designers.

2. Engineering Support

Assist agency engineers and cities, counties, and contractors on standards and design procedures by conferring, analyzing projects, and proposing designs and engineering solutions. Do bridge load capacity calculations, recommend bridge load restrictions, assist in development of bridge strengthening designs, review overweight truck permit applications and maintain databases of load rating information. Apply technical expertise to bicycle/pedestrian issues on project teams and with community groups and local agency officials. Review traffic control for local government plans.

Do traffic safety studies, including data collection, organization and analysis as well as writing, reporting, and presenting findings. Evaluate unique traffic engineering problems as they relate to crashes and safety improvement projects. Assist project teams with traffic crash analyses required for developing, modifying and assessing transportation alternatives.

3. Transportation Analysis

Do traffic engineering analysis; evaluate the impacts of projects, and prepare traffic data for use in environmental impact statements and design analysis. Analyze data to decide the vehicular capacity and level-of-service for freeway interchanges, highway intersections, and various roadway sections in both rural and urban settings. Review local land use proposals, development proposals and access management issues; and recommend approval, denial, or mitigation based on findings from analysis.

Develop, analyze and maintain large quantities of transportation data and analyze highway performance and traffic needs in corridor and other planning work. Apply specialized analysis tools and assist in integrating this work with statewide transportation models.

4. Field Engineering

Prepare complex field engineering designs, participate on project teams, write contract change orders, review plans and specifications for quality and quantity, review and oversee project designers' work, oversee project scoping, analyze project schedules, and review and oversee the work of field construction personnel. Assist in negotiating contract change orders, resolving contractor claims, and identifying and tracking force account work.

Develop digital terrain models of final subgrade surface for large highway construction and interchange projects. Interpret intent of design and specifications by consulting with designers and contractors.

RELATIONSHIPS WITH OTHERS

Employees in this class have regular contact, in person and by telephone, with employees in other units, contractors' and consultants' employees, and citizens. They contact these people to exchange or provide design, construction, planning or scheduling information or to solve problems. There is frequent contact with city, county, state and federal agencies, and utility companies to exchange information or solve problems.

SUPERVISION RECEIVED

The Associate in Engineering 2 works under general supervision of a manager or engineer. On new or unusual assignments they seek direction as needed. A higher-level engineer or engineering manager reviews work upon completion for conformance to agency policy and engineering standards. As the employee is experienced in completing specific technical work, he or she receives less review and

guidance. Employees use state regulations, state and federal engineering standards, guidelines and manuals to complete the assigned work and to review the work of others.

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.

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

Theories, principles, practices and methodologies of civil, structural, or traffic engineering science.
Engineering practices, statistics, and advanced mathematical techniques such as those gained through the study of calculus and differential equations.
Engineering design principles and techniques used to produce plans and drawings.
Principles and processes of public works construction projects.
State and federal engineering standards, guidelines, manuals, and procedures typically used for the engineering specialty.
Physical characteristics and properties of construction materials.
Composition, structure and properties of substances and the chemical processes and transformations that they undergo.
Materials, methods and the appropriate tools to construct structures typical to the engineering assignment.
Typical engineering software programs used to design, analyze engineering data, and model or predict information.
Contract management and project management principles and techniques.
Structure and content of the English language including the meaning and spelling of words, rules of composition and grammar.
Instructional methods and training techniques.

Skill to:

Apply engineering principles and theories to discipline of assignment.
Use advanced, inferential mathematics and statistics to solve engineering problems.
Make engineering computations sufficient to the level of assignment.
Analyze needs, requirements and design standards to create a design.
Weigh the relative costs and benefits of a potential action.
Analyze and review conflicting requirements of cost, safety, size, strength, performance, standardization and operation to recommend engineering solutions.
Organize, analyze, interpret and evaluate engineering problems and prediction of results.
Read, understand and apply specific information found in technical manuals, specifications, contract plans and other guidelines.
Compile data and statistics, and apply engineering computations to design projects.
Solve engineering problems at the level of assignment.
Develop complete engineering plans.
Design and conduct studies to identify and recommend solutions to engineering problems.
Read and interpret plans and specifications.
Prepare clear and concise written reports of technical subject matter suited to the needs of the audience.
Communicate verbally and in writing with a variety of people; answer questions; and explain technical information, regulations and decisions in an understandable manner.
Effectively represent the agency to the public and outside contractors.
Establish and maintain working relationships.
Plan and complete multiple engineering projects concurrently.
Review the work of other engineering personnel for accuracy and completeness.
Identify the scope and complexity of a project and identify resources to complete segments of the project.
Use computer software programs to analyze engineering data or produce designs.
Apply principles, methods and techniques of related professional disciplines.

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