PROFESSIONAL ENGINEER 2 3149

GENERAL DESCRIPTION OF CLASS

The PROFESSIONAL ENGINEER 2 plans and directs the most complex, intricate design of major facilities or other specialty engineering areas to solve unusual engineering problems. Employees in this class serve as staff advisor and engineering expert in one or more specialty areas in their agency. Employees in this classification may be a lead engineer to a team or unit. They serve as advisors to management in determining policies and the future direction of their specialty within the agency. Employees at this level manage significant projects having a broad impact on the state infrastructure. These projects require a high level of technical proficiency as well as coordination and administrative responsibility.

DISTINGUISHING FEATURES

The Professional Engineer 2 is the fourth level of a four-level series. Positions in this class are experts in their field of specialization. Employees actively participate in the improvement and strategic direction of their engineering specialty within the agency. They advise management on the need to establish agency policies, Administrative Rules, or proposed legislation.

The application of advanced engineering expertise to solve unusual and complex engineering problems with original solutions distinguishes this class from the lower level. It is further distinguished from the lower class by making judgments that can directly affect statewide infrastructure.

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 the most intricate and complex transportation projects, such as Interstate freeways, Interstate or expressway interchanges, major water crossings and highly specialized or innovative structures. Evaluate transportation problems considering local transportation plans, environmental issues, traffic data, accident data, local site conditions, and public involvement to develop unique and complex engineering design solutions. Propose and initiate or implement solutions. Analyze complex engineering problems that arise during location, design, or construction and apply advanced methods, materials, techniques, and processes to bring resolution. Manage, review, advise, critique, and recommend amendments of the work of professional consultants.

2. Research

Research and develop new design concepts. Evaluate new or original methods for application to agency projects including new roadway or engineering materials, techniques, and processes. Review professional journals, publications, and research documents to stay current on latest methods, materials, and practices in the area of specialization and related areas. Apply research results to develop original engineering solutions or to give management advice. Present training classes, workshops, or conferences in an area of specialization based upon engineering experience, research, and knowledge.

2. Consultation

Inspect and evaluate unusual engineering problems such as major structural, traffic and transportation systems; access management, geotechnical, hydraulic, pavement, or other problems. Propose, initiate or implement design or construction modifications. Answer inquiries about engineering design, state or federal policies and standards, and agency direction from other government and state agencies, the public and consultants. Give consultative advice to all levels of agency management.

Represent the agency on professional committees and task forces with other states and public agencies. Serve as consultant to management on complex issues in areas such as design standards, value engineering, management of outsource suppliers, interchanges, sophisticated signal systems, structure and roadway materials, hydraulics, access, or other specialized engineering areas.

As an agency expert in an area of engineering specialization, provide documentation and testimony as an expert witness for the agency or as requested by other agencies or the private sector. Research and compile documentation and testify to support and represent the agency's interest in court actions.

3. Administrative Duties

Assist supervisor by assigning, reassigning, and reviewing work to meet project schedules or lead a team of engineers on significant or unusual projects. Manage assigned projects within project schedule and budget and address and solve issues that affect schedule and budget. Review and manage complex projects performed by consultants and contractors. Lead and oversee the development and administration of outsourcing contracts for highway construction projects. Coordinate statewide or regional activities relating to area of specialization to maintain consistency. Represent the agency on national or regional transportation committees.

4. Training

Develop and implement training programs on methods, procedures, and theory involved in an area of specialization for agency and outside agency engineers. Prepare and deliver engineering seminars, workshops, and presentations to consultants, contractor and industry organizations, professional engineering committees and task forces.

RELATIONSHIPS WITH OTHERS

Employees in this class have frequent in-person or telephone contact with staff in other sections and agency administrators, with local, state, and federal officials to interpret and explain issues concerning all facets of transportation projects, and with contractors and consultants to explain department policy and standards. Employees make presentations in an area of specialization to consultant, contractor and industry organizations; professional engineering groups; seminars; conferences; and workshops.

SUPERVISION RECEIVED

Employees in this class receive general supervision from a program manager. Formal reviews are done in conjunction with individual performance planning. Employees work with considerable autonomy and technical work is generally completed without further review. The employee determines the methods used in developing a project or finding a solution to a particular engineering problem, and the accuracy and

adequacy of the completed product. Much of the assigned project work requires application of theoretical knowledge with work generated from the employee's own knowledge and experience in engineering.

Employees use state and federal engineering policies, guidelines, regulations and manuals; and professional journals, publications, and research documents to complete their assignments. They consult with their manager or other engineering experts to develop new solutions to unusual engineering problems.

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)

Extensive knowledge of:

Theories, principles, practice, and application of professional engineering in one or more specialized engineering disciplines.
Methods, tools, and equipment used in design and construction.
Methods of analysis for complex and high-risk transportation related engineering problems.
Advanced engineering mathematical techniques such as those gained through the study of calculus and differential equations.
Physical characteristics and properties of construction materials.
Composition, structure and properties of substances and the chemical processes and transformations they undergo.
State and federal regulations, standards, and specifications of design and construction.
Typical engineering software programs used to design, analyze engineer data, and model or predict information.
Contract management and project management principles and techniques.

General knowledge of:

Theories, principles, practice and application of professional engineering in a broad range of engineering disciplines related to transportation.
Structure and content of the English language including the meaning and spelling of words, rules composition and grammar.
Instructional methods and training techniques.

Skill to:

Solve complex problems not previously encountered, synthesize diverse areas and views and determine feasible solutions.
Recognize potential problems and develop innovative solutions.
Gather, consolidate, analyze, and evaluate engineering data to determine the best course of action.
Weigh the relative costs and benefits of a potential action.
Analyze and reconcile conflicting requirements of cost, safety, size, strength, performance, standardization and operation to design engineering solutions.
Use computer programs to analyze engineering data and produce designs.
Write clear and concise technical reports and draft policies, procedures, standards, legislation, and administrative rules.
Communicate orally and in writing with a variety of people to answer questions and explain information, specifications and policies and to effectively represent the agency as an agency witness in litigation.
Establish and maintain collaborative working relationships with vendors.
Apply engineering expertise to identify and resolve unusual contract administration problems.
Evaluate new and innovative designs proposed by consultant services.
Effectively plan and manage multiple complex engineering projects.
Identify the scope and complexity of a project and effectively assign segments of that project.
Lead others in assigned area (e.g., oversee, orient, train, plan, assign, coordinate or review the work of other engineering staff).
Lead specialty area and advise management in the development and direction of one or more agency engineering specialties.
Evaluate and correct engineering work done by professional consultants and contractors.

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.

Adopted 10/2005

Revised

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