



Mechanical Engineer, GS-0830-7

Standard Position Description Number: REN0800

Introduction

This position is located in an operating office (Office) within the Bureau of Reclamation (Reclamation) within the Department of the Interior (Department). This position serves as a developmental engineer carrying out conventional or routine mechanical engineering assignments throughout the Office, which typically include a variety of geographic locations. Mechanical engineering assignments may specialize in one or more specialties: Design, Construction Management, and Operations and Maintenance (O&M). Complex features/facilities include hydroelectric generating powerplants; pumping plants; buildings; and multipurpose water conveyance, and storage systems such as dams, canals, pipelines, tunnels, desalination, and related appurtenant systems. Mechanical systems include piping systems, heating ventilation and air conditioning (HVAC), fire protection, water treatment process systems, large gates, fish handling equipment, cranes, hoists, elevators, turbines, and pumps.

This SPD must be used in conjunction with the other BOR Mechanical Engineer SPDs for developmental purposes and may not be used as a stand-alone or FPL GS-7.

Major Duties

Performs these major duties in a developmental capacity and on a regular and recurring basis with Engineering Analysis being performed a minimum of 25% of the work time.

Reviewing

Works with higher graded engineers to develop skills for technical reviews, peer reviews, and checking of designs, drawings, engineering analysis, technical documents, specifications, cost estimates, and contract correspondence, ensuring documents are accurate and quality assurance processes were followed. Reviews may be outside of the organization or designed by others. Signs documents for technical approval in accordance with Reclamation and Department policies, directives, and standards; this includes signing as the engineer in responsible charge.

Engineering Analysis (minimum 25% of work time)

Performs conventional and routine engineering analyses associated with segments of engineering assignments or projects of broader scope to include technical planning activities; data collection; modeling and data analyses; analyses of site location and/or conditions; troubleshooting equipment and systems; and risk estimation and analyses. Analysis assignments may involve specific assignments in one or more specialty areas of mechanical engineering. Makes engineering recommendations or draws conclusions based on engineering analysis. Prepares or evaluates conventional and routine engineering designs and/or participates, in a developmental capacity, in engineering design studies and projects. Provides engineering design, analyses, review, inspection, and/or documentation for conventional and routine mechanical engineering assignments, selecting the best solution from several precedented alternatives.

Documentation and Presentation

Drafts technical documentation for conventional or routine engineering assignments or for assigned portions of broader projects. Makes internal presentations of technical documentation. Prepares routine engineering documentation and participates in investigations and in the planning process.

Investigations, Assessments, and/or Inspections

Participates in engineering facility examinations, reviews, and/or inspections which include conventional and routine tasks associated with conducting condition assessments and construction and transfer inspections; identifying deficiencies relative to design criteria, applicable codes and standards, or state or federal statutes or regulations; calculating

preliminary estimates for repairs; documenting results; identifying future needs for the asset investment such as extraordinary maintenance and rehabilitation.

Other Duties (non-grade controlling/non-series controlling work)

Performs developmental assignments and tasks associated with any of the following: project management; administration of contracts and agreements; and database operation.

Performs other related duties as assigned.

Factors

Factor 1. Knowledge Required by the Position (Level 1-6 950 pts)

Professional knowledge of, and skill in applying, mechanical engineering theories, concepts, principles, standards, and methods sufficient to perform conventional or routine engineering analyses and design; prepare engineering documentation and participate in investigations and in the planning process; and to provide engineering design, analyses, review, inspection, and/or documentation for conventional and routine mechanical engineering assignments, selecting the best solution from several precedented alternatives.

Practical knowledge of the fundamental principles and concepts of mechanical equipment and systems.

Understanding of common engineering data collection methods. Ability to identify and assess the data needed for engineering assignments.

Knowledge of common engineering data collection methods. Knowledge of data sources within Reclamation and industry. Skill in identifying and assessing the data needed for engineering assignments.

Knowledge of automated engineering systems and applications in order to plan, gather the appropriate data for input into the system, and assess, interpret, and analyze the validity of the generated results. Skill in using computers, software applications, databases, and automated systems to accomplish conventional engineering assignments which may include programming, scripting, and/or coding.

Skill in effectively conveying information to individuals or groups, taking into account the nature of the information (e.g., technical). Skill in writing in a clear, concise, and organized manner. Ability to establish collaborative working relationships; identify and analyze problems; and determine relevancy of information to make logical decisions and develop solutions.

Understanding of cost estimating practices and principles to draft routine construction cost estimates for planning, final design, and procurement (e.g., IGCE and contract modifications).

Knowledge of and skill in applying qualitative and quantitative analytical techniques and project management principles, methods, tools, and techniques in order to monitor project plans and resources.

Factor 2. Supervisory Controls (Level 2-2 125 pts)

The supervisor or higher graded engineer instructs the incumbent on the objectives of the assignment and its scope, limitations, expected deadlines, and priorities. The supervisor provides specific instructions on work methods and new

assignments. The incumbent is expected to work independently, but within the framework established by the supervisor; follow established practices and prescribed procedures; and refer problems not covered by instructions or guides to the supervisor for help or a decision. The supervisor or higher graded engineer reviews completed work closely to verify accuracy and conformance to required procedures and any special instructions; reviews findings and conclusions to ensure they are supported by facts; and they typically review the more difficult and/or unfamiliar work in greater detail.

Factor 3. Guidelines (Level 3-2 125 pts)

Guidelines for the engineering assignments are directly applicable and there are clear precedents. The incumbent refers any situation where the guidelines cannot be applied or require significant deviation to the supervisor or higher graded employee for interpretation and additional guidance. The incumbent uses judgement to select and apply the most appropriate guidance and references and decides on the appropriateness of minor deviations within the guidelines.

Factor 4. Complexity (Level 4-3 150 pts)

As a developmental engineer, engineering assignments are conventional and routine and are meant to advance and enhance the knowledge, skills, and abilities of the incumbent. Assignments will range from performing related tasks to assignments involving different and unrelated processes and methods. The incumbent analyzes and evaluates the assignment and selects appropriate course of action from precedent alternatives. The incumbent must analyze and evaluate phases, conditions, and problems related to the conventional engineering assignment. Assesses implemented and planned actions for accuracy, feasibility, and adequacy in meeting the objectives of the engineering assignment and selects the most appropriate course of action from many acceptable alternatives.

Factor 5. Scope and Effect (Level 5-2 75 pts)

This position serves as a developmental engineer carrying out conventional or routine assignments meant to provide experience that advances and enhances the incumbent's knowledge, skills, and abilities in engineering. Assignments involve performing engineering tasks that require application of specific standards, methods, and procedures and comprise a complete segment of an assignment or project with a broader scope. By performing assigned tasks, the incumbent impacts the work of the Office by completing the detailed and routine portions of the broader work assignment thus helping other engineers, architects, or scientists and contributing to the timeliness, reliability, acceptability, and accuracy of the finished solution, product, or service. Engineering assignments impact the life, health, and property of the general public and impacts the Department's and Reclamation's credibility with internal and external customers.

Factors 6. & 7. Personal Contacts and Purpose of Contacts (Level 6-2 and 7A 45 pts)

Personal contacts include counterparts and employees within the immediate Office and other offices throughout Reclamation, as well as from industry such as manufacturers' representatives and contractors. Contacts are for the purpose of obtaining, clarifying, and exchanging information and data as part of engineering activities.

Factors 8. Physical Demands (Level 8-1 5 pts or Level 8-2 20 pts)

- (Level 8-1) The work is typically performed in an office setting with no special physical demands. However, work may also be performed in the field which involves periods of moving about worksites, bending, climbing, or driving motor vehicles to worksites.
- (Level 8-2) The work regularly combines both office and field assignments. Field work requires physical exertion, such as long periods of standing, or recurring and considerable walking, stooping, bending, crouching, crawling, and climbing such as in regular and periodic construction activities and field inspections. Work may also include frequent lifting of moderately heavy items weighing less than 50 pounds. Field assignments may involve driving motor vehicles to work sites in remote locations requiring overnight stays.

Factor 9. Work Environment (Level 9-1 5 pts or Level 9-2 20 pts)

- (Level 9-1) The work is usually performed in an office setting. However, work time may also be spent periodically visiting field sites. Field site visits are typically performed in either an outdoor setting subject to weather changes, diverse terrain, and safety hazards associated with working around complex features and/or construction, or an industrial setting subject to noise, fumes, and moving machinery. Both settings may require the use of personal protective equipment. The work may also involve some overnight travel for training, meetings, and site visits. Safety precautions and protocols are observed at all times, and the incumbent complies with safety instructions and regulations and ensures individual and others' safety by promptly reporting unsafe acts, unsafe conditions, and accidents to the supervisor.
- (Level 9-2) The work involves regular and recurring exposure to moderate risks, discomforts, and unpleasantness such as: high noise levels, infectious materials, or toxic or irritating chemicals; travel in safety approved small aircraft and watercraft; high winds and low or high temperatures; infestation of dangerous reptiles or poisonous plants, snakes, or insects; adverse weather conditions; noxious fumes; flammable liquids; or radiation. The work involves performing tasks in close proximity to rotating heavy mechanical and electrical machinery and may involve working within confined spaces for extensive periods of time. Special safety precautions such as protective clothing and gear are necessary. Safety precautions and protocols are observed at all times, and the incumbent complies with safety instructions and regulations and ensures individual and others' safety by promptly reporting unsafe acts, unsafe conditions, and accidents to the supervisor.

Total Points and Grade Conversion

Total Points = 1480 (low) 1510 (high)

Point Range = 1355-1600

Grade = GS-7

Other Significant Facts

Functional Classification (FC): Completed by servicing human resources office and annotated on PD Cover Page.