STATE OF SOUTH DAKOTA CLASS SPECIFICATION

Class Title: Transportation Project Engineer **Class Code: 40853**
Pay Grade: GJ

A. Purpose:

Transportation Project Engineers plan, design, and administer transportation projects that serve people.

B. Distinguishing Feature:

Transportation Project Engineers are assigned transportation projects to manage, and work independently with minimal supervision.
Transportation Engineers are entry level positions and work under direct supervision of other engineering staff for a minimum of two years to learn the application of standard engineering techniques to transportation projects.
Transportation Lead Project Engineers provide work coordination and direction and engineering expertise to a minimum of four professional positions, at least one of which is a Transportation Project Engineer; and manage assigned transportation projects.

C. Functions:

(These are examples only; any one position may not include all of the listed examples nor do the listed examples include all functions which may be found in positions of this class.)

1. Compiles, analyzes, and evaluates technical, project-specific data and information to ensure valid preliminary engineering data is used for project development.
   a. Collects, analyzes, and evaluates data.
   b. Conducts site inspections and locational analyses to determine scope and other engineering requirements and options of projects.
   c. Develops various preliminary project layouts and estimates of costs.
   d. Facilitates information exchange with other agencies and the public.

2. Develops designs to provide cost effective, constructible, and safe projects that meet state and federal laws and rules.
   a. Applies scientific and mathematical principles to create project designs.
   b. Estimates costs of projects.
   c. Evaluates and selects materials and calculates necessary quantities.
   d. Develops special provisions, and prepares plan notes, tables, and details.
   e. Reviews and approves shop drawings and catalog cuts.
   f. Acquires and organizes technical, project-specific information from various offices.

3. Assembles, reviews, and revises plans to ensure data has been applied correctly and assembled as intended in the designs.
   a. Oversees preparation of plans to include plan sheets prepared by other offices, and ensures that applicable standard plates are included.
   b. Incorporates appropriate revisions into plans following department reviews, final inspections, and property acquisition.
   c. Reviews plans and plats to ensure accuracy, cost-effectiveness, constructibility, and compliance with standards and engineering principles.

4. Administers assigned projects; and schedules and directs personnel to ensure deadlines are met and projects are constructed according to plans.
    a. Provides project construction information to contractors and landowners.
    b. Determines project staffing requirements based on level of engineering and technical expertise required and other project-specific requirements.
    c. Interprets plans for contractors and resolves problems, organizes work activities to assist them, and monitors their work.
    d. Assigns work to project staff, answers their questions, and monitors their work and record keeping.
    e. Keeps the project diary.
    f. Prepares and maintains project documentation.
    g. Verifies completion of projects and prepares final documentation.

5. Analyzes, reports on, implements, and provides technical expertise on engineering technology, materials, and procedures to enhance department processes and outputs.
    a. Collects and analyzes data, designs strategies to incorporate data results into department standards, and estimates costs.
    b. Performs life cycle cost analyses.
    c. Designs and verifies mix designs.
    d. Conducts research of current industry standards and test procedures.
    e. Writes specifications, manuals, and sampling requirements.
    f. Analyzes engineering processes to validate accuracy of planning values.
    g. Conducts load analyses.

6. Performs other work as assigned.

D. Reporting Relationships:

Reports to an administrative engineer. Does not supervise but routinely provides work direction to technicians, draftsmen, and seasonal employees.

E. Challenges and Problems:

Challenged to create cost effective transportation projects that are in compliance with prevailing engineering standards; and state and federal laws and rules. This is challenging because it requires the project engineer to manage and coordinate the steps and procedures necessary to verify data and information are accurate and current; project parameters and cost estimates are reasonable and efficient; project design accomplishes the intent of the project, and all design requirements are included; plans are reviewed and ready by the scheduled bid letting dates; construction is implemented as intended in the plans; landowners are informed and satisfied; and projects are finalized. Further challenged to evaluate the value of incorporating new technology and processes into existing methods of business. This is difficult because there are many processes, sometimes overlapping, and it is not always clear what long-term effects of change will be; it requires overcoming resistance to change; and it requires significant research and justification to prove the benefits.

Problems include scheduling inspections that involve a number of people; working with entities who are not supportive of projects; making design standards fit into projects with limited budgets; limited project time frames; coordinating with other offices to get plans organized, reviewed, and completed; keeping up to date on changing technology; incorporating and managing additional work not in the original plans; organizing engineering paper work for

multiple projects, and making sure everything is checked and organized into appropriate files; validating the value of research; and keeping current with industry standards.

F. Decision-making Authority:

Decisions include preliminary engineering requirements for assigned projects; project design based on evaluation of project data, feasibility, safety, functionability, and standards and specifications; materials and quantities of materials to be used; recommendations for project scope based on information gathered from meetings, design standards, old plan reviews, Area office input, and feasibility; initial project cost estimates for various layouts; recommendations for design exceptions or changes; recommendations for special provisions; whether review revisions should be included in plans or not; recommendations for accommodating landowner requests; whether or not contractors are in compliance; whether materials meet specifications; priority of work assignments for staff; site plan changes within established parameters; recommendations for approval of mix designs; and recommendations for new and revised specifications.

Decisions referred include resolution of issues and conflicts that have reached an impasse; resolution to disagreements with outside entities about scope of work; approval of revisions to standards; design requirements not investigated during preliminary scoping processes; issues that will adversely affect adjacent properties; final approval of design; clarification of design guidelines; issues that involve multiple layers of project design; approval of designs done with non-standard policies and procedures; approval of design exceptions; approval of design changes; approval of rehabilitation strategies; final approval of estimated construction costs; final approval of plans; final approval of mix designs; and final approval of specifications.

G. Contact with Others:

Daily contact with draftsmen, technicians, and seasonal staff to discuss work assignments; with contractors to resolve construction-related problems, correct work, and discuss work schedules; with region and area staff to exchange information on projects in their locations, to request more survey data, and to schedule inspections; with Lead Project Engineers for advice on projects; with Area Engineers and Engineering Supervisors for consultation on project issues; with officials from other agencies affected by projects to negotiate agreements, exchange information, and review projects; and with consultants to obtain and distribute project information, check and maintain schedules, and answer questions; weekly contact with other engineers working on plan sections to discuss issues that affect design such as work limits, rights of way, structure lengths, etc.; with equipment suppliers for purposes of calibration and certification and for gathering design information; with local governments to negotiate agreements, exchange information, and review projects; and with federal offices to exchange information; occasional contact with other departments of transportation and counterparts from other states to exchange ideas and information; and with consultants to discuss software and capabilities; and contact as needed with the public, landowners, and business owners to introduce and explain projects and gather input and comments; with city personnel to coordinate project design; and with utility companies to coordinate power usage and locations for signals and lighting.

H. Working Conditions:

Works in a typical office environment; in laboratories with exposure to chemicals, high temperatures, and electronic equipment; on construction sites where there may be exposure to

weather and other environmental conditions, high traffic, heavy equipment at work, and hazardous materials and situations.

I. Knowledge, Skills, and Abilities:

Knowledge of:

- theories, principles, and practices of civil engineering;
- legal ramifications associated with the work performed;
- state and federal design standards;
- South Dakota's current defined standards and specifications for roads and bridges;
- engineering properties of materials and surfacing types;
- computers and computer software;
- rehabilitation and maintenance techniques;
- pavement performance monitoring, and inventory systems;
- engineering economics;
- pavement management and design;
- practical construction concepts.

Ability to:

- interpret, understand, and implement state and federal laws and rules; and department standards, policies, and procedures;
- understand all levels of project design;
- provide effective project cost estimates;
- plan, prioritize, and organize work and project details to meet goals and deadlines;
- establish and maintain good working relationships with coworkers, other staff, local governments' staff, contractors' staff, and the public;
- assign and direct the work of others;
- multi-task and be a self-starter;
- work individually and as part of a team;
- use administrative and design software;
- communicate clearly and concisely.