

STATE OF ALASKA

COMPETENCY SPECIFICATION

Occupational Group: LABOR, TRADES AND CRAFTS

CAREER AREA:

MATERIALS LABORATORY TECHNICIAN 9581
9581-59
9581-57
9581-56
9581-54
9581-53
9581-52
9581-51

Definition: Performs field or laboratory tests of construction and geological materials according to prescribed test procedures. Laboratory work is done under controlled conditions and covers a greater variety of tests than is possible at an inspection site.

Levels:

Competencies are the required knowledge, skills, abilities and work behavior demonstrated and required for the on-going essential functions of the job. Possession of competencies alone *will not* automatically advance an incumbent; rather, the incumbent must utilize and demonstrate the competency in the on-going performance of *assigned* duties.

Progression will be measured in part by level of testing proficiency as demonstrated by performance and level of National Institute for Certification in Engineering Technologies (NICET) certification. Level of supervision varies with degree of competency as demonstrated within each category.

SUB-JOURNEY: ENTRY/TRAINEE: Worker is under close supervision and review. The work is designed to provide orientation, training and familiarization with the processes of the occupational field; reinforces and supplements previous experience and education; and allows the trainee to carry out progressively more difficult and responsible tasks.

9581-59 **I** entry trainee under direct supervision

SUB-JOURNEY: Worker provides assistance to others by performing the more routine, non-specialized and repetitive tasks that do not require the more specialized skills. Basic tasks are performed independently and those of progressive difficulty are performed under direct supervision until proficiency is demonstrated.. The designation of Sub-journey does not infer that the work must be always in the company of another and/or higher level employee.

9581-57 **II** assists in field materials testing, in field or laboratory setting and demonstrates on-going competency.

9581-56 **III** performs a variety of standard tests on soils and aggregates and concrete, and assists in servicing and repair of laboratory equipment. This level has limited responsibility, and the sole duty may be limited to certain testing procedures.

9581-54 **IV** under general supervision, performs standard and complex tests in two or more skill areas of testing soils/aggregates, concrete/cement, bituminous mix, bituminous materials and special product materials. Performs a minor role in laboratory accreditation.

JOURNEY: Worker is fully proficient. Work is performed independently, using standard methods and techniques, and consists of assignments that are typical of the occupational field. Journey workers can use a variety of interrelated skills to independently complete work that conforms to industry standards. The work may require proof of competence, training or certification.

9581-53 under general direction, performs standard and complex tests in three or more skill areas of testing soils/aggregates, concrete/cement, bituminous mix, bituminous materials and special products; performs bituminous and concrete design mixes. Performs a major role in laboratory accreditation.

SPECIALIST Work routinely requires the resolution of unusual, difficult or exceptional issues by developing or modifying approaches, methods or techniques.

9581-52 under general direction performs all journey level testing functions, and in addition performs research or materials related projects requiring additional, advanced skills.

OR

LEAD: Worker performs the work and leads a group of other workers as defined by the collective bargaining unit contract, by directing and reviewing tasks. Lead worker assigns work; sets schedules and priorities; determines methods; provides training and instruction; evaluates and approves completed tasks.

9581-52 serves as a working foreman of an accredited materials laboratory over three or more technicians.

FOREMAN: Worker who acts as an intermediary between workers and management to organize, assign and directly supervise the work of a labor, trades and crafts occupational group. The worker is accountable for the quality and quantity of the work accomplished.

9581-51 supervises the test functions of an accredited laboratory over seven or more technicians; performs and directs standard, non-standard and research testing; prepares test reports, and evaluates test procedures and specifications.

NOTE: A laboratory shall have no more than one materials laboratory technician foreman level.

Essential Core Competencies: “Common or typical” to the career area and required for all levels as appropriate to the specific position. *These are included in the position description and performance evaluation review process.*

Materials Laboratory Technician core

Knowledge of:

- oral and written communication in order to communicate effectively with a variety of people
- mathematics to calculate, record and interpret computations
- terminology, definitions in common use in the physical sciences

Ability to:

- learn personal and site safety practices and procedures encountered in the work
- learn basic unit weights and measures and metric units and conversion
- learn concepts of volume, ratio and proportion
- follow oral and written technical direction
- learn nomenclature and use of standard equipment in basic material testing
- perform repetitive tasks to obtain consistent results
- work cooperatively with those encountered
- prepare accurate and legible notes, messages, reports or summaries
- measure and weigh liquids and solids accurately
- use standard calculators and office equipment
- learn and apply principles, techniques and processes applicable to the job

Skill in:

- basic safety awareness and protocols and basic response to emergencies
- appropriate and efficient use of time and equipment
- appropriate selection of equipment, clothing, and safety tools applicable to the task
- working cooperatively as a team member in a variety of settings

NOTE: All incumbents, all levels, will be expected to be proficient in, and perform any duties of any lower level while preparing for higher level competencies.

SUB-JOURNEY level workers will be required to meet the following

TO:

- have the aptitude to develop, practice and use needed skills and work behaviors
- apply verbal and written instructions to individual and grouped tasks
- perform routine tasks with consistent results
- recognize situations requiring additional supervision or instruction in order to request assistance
- apply acquired skills, knowledge and abilities to new tasks
- learn proper usage and care of tools and equipment of the trade or craft

Materials Laboratory Technician Sub-journey 9581 - XX

WG as determined by level of tested proficiency.

Knowledge of

- applicable procedures, standards and criteria of tests assigned
- applicable state and federal regulations and laboratory standard operating procedures
- algebra
- occupational hazards and safety practices
- basic equipment operation and maintenance

Ability to

- find, interpret and follow detailed and technical instructions applicable to required tests
- follow test procedures and obtain and record reliable results
- measure accurately to the precision required
- recognize questionable results and refer to higher level technician for resolution, assistance or remedy
- inspect test equipment

Skill in

- increased proficiency and consistency in tests performed

EXAMPLES OF DUTIES:

SUB JOURNEY 9581-59

Learns to prepare samples for designated test in the Soils/Aggregate skill areas.
Works in the dirt room under supervision and does gradations.
Learns laboratory procedures and trains in additional procedures.

SUB JOURNEY 9581-57

Prepares samples for testing under direct supervision, and performs designated tests in the Soils/Aggregate skill area.

Prepares samples for testing by others.

Trains in additional materials testing procedures.

SUB JOURNEY 9581 -56

Under general supervision, performs designated tests in the Soils/Aggregate and Concrete skill area.

Is accountable for recognizing questionable results and taking appropriate action.

Repairs standard material testing equipment.

SUB JOURNEY 9581-54

Under general supervision, performs designated tests in two or more of the highest sub-journey skill areas of Soils/Aggregate, Foundation, Concrete/Cement, Bituminous Mix, Bituminous Materials and/or Special Products.

Inspects, calibrates and verifies standard test equipment.

JOURNEY level workers will be required to meet the following

TO:

- have the required skills to handle difficult problems encountered
- have comprehensive knowledge of the subject or occupational area
- use judgment in determining actions
- exercise independence in determining actions
- plan and lay out work (i.e. determine how to do one's own work)
- make appropriate choice among alternatives
- complete work with only limited instruction and/or little or no advice
- proceed with work without having results or products generally reviewed in progress

Materials Laboratory Technician Journey 9581-53

in addition

Knowledge of

- construction practices to determine appropriate tests and sequence
- applicable specifications, test methods and procedures

Ability to

- assess laboratory or test needs and make recommendations on improvements

Skill in

- applying test procedures to a variety of construction materials in efficient and effective manner
- documenting test results

- use of computer word processing, spreadsheets and databases for documentation of results

EXAMPLES OF DUTIES:

Under general direction, performs designated tests in

- three or more of the highest sub-journey level skill areas of Soils/Aggregate, Foundation, Concrete/Cement, Bituminous Mix, Bituminous Materials and/or Special Products.
- two or more of the journey level skill areas of Foundation, Concrete/Cement, and /or Bituminous Mix

Performs non-standard testing of all other construction materials.

Interprets and graphs tests.

Calibrates nuclear test equipment.

Demonstrates ability to perform all procedures for laboratory accreditation.

Performs and trains others in lower field and laboratory workers.

ABOVE JOURNEY / ADVANCED level worker encompasses in addition the requirement

TO:

- complete unusually difficult work
- adapt and modify procedures, operations or processes required to complete the work
- work in absence of available or applicable guidelines
- consistently apply skills of a higher level of difficulty required

LEAD worker will be required

TO:

- assign, monitor, train and evaluate daily tasks
- make decisions and set and balance priorities
- coordinate tasks of others and work efficiently
- ensure adherence to work schedules, quality standards, safety and security rules
- give clear instructions
- recommend appropriate solutions to difficult situations
- motivate others

Materials Laboratory Specialist or Lead 9581 -52
in addition

Knowledge of

- plans and specifications for complex sampling and special testing procedures
- geotechnical investigation and construction requirements and practices to determine test programs
- applied statistics
- administrative and technical report writing

Ability to

- prepare detailed oral and written explanations of findings or reports
- plan, schedule and provide training sessions on laboratory processes and procedures
- interpret test results
- explain and demonstrate complex test procedures

Skill in

- accurate test measuring, documentation and verification
- the resolution of mix design problems and trouble shooting test problems
- computer database management

EXAMPLES OF DUTIES:

Evaluates new test methods Performs tests and writes result reports.
Performs research on, and makes recommendations for use of new products.
Develops, recommends new lab processes or procedures.
Calibrates, sets up, repairs and inventories test equipment.

FOREMAN in addition will be required

TO:

- apply knowledge of individual and team behavior to the workplace
- display knowledge of supervisory principals and methods in dealing with employees
- utilize knowledge of best practices to maximize staff potential
- plan and manage resources to meet quality and quantity goals
- coach, mentor and counsel staff to meet competencies
- formulate training plans
- create and maintain an atmosphere of teamwork
- manage staff and resolve conflicts
- organize, set priorities, assign, evaluate and direct work of staff and/or contractors
- prepare and maintain records, correspondence and reports
- ensure safe work environment
- display skill in problem solving

Materials Laboratory Technician Foreman: 9581 -51
in addition

Knowledge of

- construction project administration
- procurement and supply procedures
- national and state accreditation requirements
- effective training techniques

Skill in

- effective scheduling and operation of laboratory in time efficient manner
- maintaining cooperative work relations with project engineers, contractors, vendors and employees

- complex test procedures, mix designs and laboratory management

Ability to

- formulate training plans
- review laboratory work products and procedures and determine and correct deficiencies
- select technicians for appropriate level work and training opportunities
- prepare administrative and laboratory documentation
- coordinate inspection, calibration of equipment and certification requirements
- administer health and safety program
- advise on or propose modifications to manuals

EXAMPLES OF DUTIES:

Evaluates testing processes of lower level research efforts and writes reports.

Selects appropriate tests for material samples.

Reviews and implements new test methods.

Assigns and reviews test accreditation process and submits required documentation.

Monitors technician training progress and addresses competency issues.

Competencies and Certifications:

CORE:

- Alaska Drivers license

TECHNICAL:

- first aid/ CPR certificate
- May be required to pass designated examinations as competencies progress
- NRC nuclear densometer certification

Environmental Conditions and Physical Requirements :

Exposure to

- dirt, dust and fumes
- hazardous materials and toxic chemicals
- heat, ovens
- heavy equipment and vehicular traffic
- high voltage electricity
- ionizing radiation
- heavy equipment and vehicular traffic
- noise
- ovens up to 1000 degrees F. and heated materials
- sharp edges and instruments

Physical stamina to

- stand or walk for long periods
- lift 100 pounds regularly

Equipment:

] OFFICE:

- hand radio
- PC computer using applicable software, e.g. Dbase, SuperCalc, Lotus 1,2,3, WordPerfect
- plotter
- printer
- scanner
- programmable hand calculator
- other

] SAFETY:

- dust masks
- gloves
- hard hat
- hearing protectors
- safety glasses
- vests
- other

] VEHICLES:

- pick up truck
- other

] HAND TOOLS

- masonry saw
- sledge hammer
- other

] MATERIALS TESTING:

- aggregate splitters
- air meter
- asphalt gauge
- Atterberg limit apparatus
- Gilson and rototap shakers
- Nuclear asphalt content gauge
- Proctor hammer
- propane and electric ovens
- slump cone
- Thermolyne furnace
- unit weight bucket
- weigh scales (electronic and mechanical)

- other