

State of Nebraska

Classification Specification

Department of Administrative Services

NEBRASKA

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Click one of these links to see the Job Description for that class:

Job Code	Title
M53631	HIGHWAY MATERIALS AND RESEARCH TECHNICIAN I
M53632	HIGHWAY MATERIALS AND RESEARCH TECHNICIAN II
M53633	HIGHWAY MATERIALS AND RESEARCH TECHNICIAN III

HIGHWAY MATERIALS AND RESEARCH TECHNICIAN SERIES

DESCRIPTION OF OCCUPATIONAL WORK

The Highway Materials and Research Technician series encompasses technical work involving the sampling, testing, and inspection of materials used in highway construction and maintenance. These positions ensure that materials such as asphalt, concrete, aggregate, and various structural components meet quality and safety standards through laboratory and field testing. The series progresses from entry-level routine testing to independent material analysis and recommendations, culminating in leadership roles overseeing statewide testing and inspection programs.

Highway Materials and Research Technician I

M53631

DESCRIPTION OF OCCUPATIONAL WORK

Under immediate to general supervision, performs routine tests on asphalt, concrete, aggregate and other construction materials following established procedures; performs related work as required.

DISTINGUISHING CHARACTERISTICS: (A position is assigned to this class based on the scope and level of work performed as outlined below.)

The Highway Materials and Research Technician I class is the entry-level role in the series, primarily performing routine testing and inspection of construction materials under direct supervision. Technicians in this classification follow standardized procedures to conduct tests on materials such as asphalt, concrete, and soil, recording results and maintaining laboratory equipment. Work at this level is task-focused, requiring basic mathematical calculations and adherence to established protocols rather than independent judgment or complex analysis.

EXAMPLES OF WORK: (A position may not be assigned all the duties listed, nor do the listed examples include all the duties that may be assigned.)

Performs AASHTO, ASTM, ANSI, IMSA and AISC tests on reinforcing steel, bolts, pre-stressed strand, electrical wire, pipe and drainage products, cast iron products, other construction materials and nondestructive testing such as coating, plating and ultrasonic thickness determinations.

Performs AASHTO and Nebraska Department of Transportation (NDOT) tests on soils such as liquid limit, plastic limit, hydrometer analysis, sand equivalent, moisture density, and similar routine tests.

Performs AASHTO, ASTM and NDPR tests on cement, concrete, fly ash, concrete cores, curing materials, patching materials, and non-shrink grouts such as compression, autoclave expansion, air content, fineness, reflectivity, and similar routine tests.

Performs AASHTO and NDOT tests on aggregate such as sieve analysis, specific gravity, Los Angeles abrasion, freezing and thawing, soundness, sodium sulfate soundness, percent clay, shale and soft particles, and similar routine tests.

Performs AASHTO, NDOT and FHWA tests on oil, asphalt cement, emulsified asphalt, Performance Graded (PG) asphalt binder, diesel fuel, lube oils, hot joint sealers, gasohol, and grease, such as viscosities, penetration, distillations, evaporation, heat loss, flash point, specific gravities, and similar routine tests.

Performs AASHTO, ASTM and FHWA tests to determine the volumetric properties of asphalt concrete during design to include properties such as air voids, maximum specific gravity, voids in mineral aggregate, asphalt cement percentage, stability, flow values, "Superpave" requirements, etc.

Receives and inventories samples, prepares samples for testing, records test results, maintains lab and testing equipment, and cleans the lab.

Performs simple math (addition, subtraction, division, multiplication) functions to determine test results.

Demonstrates proper methods of performing assigned tests.

Measures final record pavement cores and records findings.

Assists with asphalt and concrete coring operations and bridge deck surveys by flagging traffic, loading/unloading equipment, measuring for coring locations, locating reinforcing steel for corrosion reading and samples, locating and identifying delaminated concrete, inventory of cores, filling holes, maintaining equipment, and similar tasks.

Installs as directed, reads and records data from field soil instruments such as inclinometers, piezometers, and settlement gauges.

Assists in on-site soil surveys including operating and maintaining soil survey equipment.

Prepares borrow pit sketches, updates soil reports and files.

Performs construction site lightweight deflectometer testing.

KNOWLEDGE, SKILLS, AND ABILITIES REQUIRED: (These are needed to perform the work assigned.)

Knowledge of: highway construction materials and procedures; basic mathematics relating to the materials tests used in the Department; the techniques and procedures involved in the sampling, testing, and inspection of materials used in the construction and maintenance of highways; the occupational hazards and safety precautions applicable to the work, such as the proper use of safety equipment, equipment operation, and materials handling; the uses of commonly issued testing equipment, devices, scales, ovens, moisture chambers, and strain gauges; materials sampling techniques, terms, and symbols; surface geology and soil maps, in some positions.

Skill in: assembling tools to perform a variety of tests, consecutively, with limited direction; the use of laboratory equipment and in performing laboratory tests. The use of sampling and testing equipment for materials testing and analysis.

Ability to: perform addition, subtraction, multiplication, and division; read and follow detailed test procedures; understand instructions and apply them to practical work situations; perform tasks repeatedly while maintaining integrity of results; set up and solve mathematical equations using addition, subtraction, multiplication and division; recognize test results outside of limits normally expected; perform basic scientific tests to determine the physical properties of materials used in the construction and maintenance of highways; convert standard weights and measures into units different from those given, including basic metric units; interpret road design plans.

MINIMUM QUALIFICATIONS: (Applicants will be screened for possession of these qualifications. Applicants who need accommodation in the selection process should request this in advance.)

Any combination of training and/or experience that will enable the incumbent to possess the required knowledge, abilities and skills. A general qualification guideline for positions in this class is a high school education or the equivalent.

[Return to Specification List](#)

Highway Materials and Research Technician II

M53632

DESCRIPTION OF OCCUPATIONAL WORK

Under general supervision, independently performs tests and/or inspections on location statewide and/or within the central laboratory; reviews and analyzes test results; identifies material properties; provides information to, and may make recommendations to, Nebraska Department of Transportation (NDOT) personnel and to contractors/producers; performs related work as required.

DISTINGUISHING CHARACTERISTICS: (A position is assigned to this class based on the scope and level of work performed as outlined below.)

The Highway Materials and Research Technician II class is the second level in the series and performs more advanced testing and inspection duties with greater independence, including analyzing test results and identifying material properties. Technicians at this level may conduct on-site inspections, train lower-level technicians and contractors on testing procedures and calibrate specialized equipment. They also review compliance with specifications, assist in evaluating new products, and provide recommendations for optimizing construction processes. Unlike Level I, this role involves some decision-making and oversight responsibilities.

EXAMPLES OF WORK: (A position may not be assigned all the duties listed, nor do the listed examples include all the duties that may be assigned.)

Determines the tests to be conducted, based on a review of contract provisions, and identifies acceptable standard deviations of test results.

Reviews routine test results to determine compliance with contract provisions/standard specifications; communicates nonconforming test results to appropriate contacts; distributes completed test results.

Analyzes test results and other collected data on material performance, noting inconsistencies or deficiencies; may maintain data files.

Trains Materials and Tests technicians, as directed, in specific task and job practices and procedures by demonstrating, explaining, evaluating, monitoring and reporting.

Trains contractor and NDOT field personnel in the use of equipment and proper test procedures such as lightweight deflectometer for stiffness evaluation, asphalt concrete test procedures performed at construction site laboratories, profilograph operation, and similar training.

Calibrates and adjusts equipment to meet specification requirements.

Reviews, tests, inspects and evaluates new products and materials such as roadside delineators, barricade warning lights, epoxies, anchor bolt systems and reinforcing steel coupling devices by making comparisons to accepted NDOT standards and/or requirements established by other NDOT Divisions.

Performs quality control sampling, testing, inspection and evaluation, reviews bid proposals, and may write specifications for various manufactured products such as wire rope, log chains, aluminum sheeting and sign blanks, grader and plow blades, metal and wood posts, batteries and other similar items.

Makes recommendations to contractors to optimize rolling patterns on asphalt laydown.

Monitors, and recommends corrections, on-site, to the quarry's production testing and delivery to assure aggregates meet standards.

Calibrates, maintains repairs and/or arranges for repairs, and assigns to District personnel, all NDOT profilographs.

Directs and/or performs on-site soil surveys, to include identifying and logging of different soil horizon data, identifying and gathering all necessary soil samples, identifying water table locations and recognizing and noting any hazardous materials (information and locations); prepares soil data for inclusion into project plans.

Reviews concrete construction reports to determine if material quantities and quality comply with contract provisions and calculates routine pay deductions for deficient material.

Assures that proper proportions and mixing procedures are used in laboratory concrete mixes.

On location statewide, through the use of instrumentation and/or contacts with utilities, consultants and private individuals, identifies specific locations free of underground dangers for soil and water sampling.

Installs water monitoring wells to identify contaminated areas; gathers water samples from contaminated areas to identify changing levels and limits of contamination.

Directs bridge deck surveys statewide, including compiling inspection data and writing final reports.

Directs and/or performs concrete and asphalt pavement coring operations to include locating designated core sites and the drilling, measuring and marking of cores.

Operates a roughness surveyor to measure pavement roughness on location statewide, calculates a roughness index from raw data and maintains historical data files.

Maintains a pavement data file for the NDOT Pavement Management System by reviewing highway construction plans, editing pavement information and entering the information into computerized files.

Operates core drills and non-destructive testing equipment to investigate sub-standard non-pavement concrete placements, such as the vertical surface of an abutment backwall.

KNOWLEDGE, SKILLS, AND ABILITIES REQUIRED: (These are needed to perform the work assigned.)

Knowledge of: the techniques and procedures, involved in the sampling, testing, and inspection of materials used in the construction and maintenance of highways; the occupational hazards and safety precautions applicable to the work such as the proper use of safety equipment , equipment operation, and materials handling; the use of commonly issued testing equipment , devices, scales, ovens, moisture chambers, and strain gauges, materials sampling techniques, terms, and symbols; surface geology and soil map, in some positions; the requirements and intent of applicable codes, standards, and specifications for materials used in the construction and maintenance of highways. The standards and specifications involved in the testing and inspection of materials used in the construction and maintenance of highways. Basic engineering principles and practices as applied to the use and production of materials used in the construction and maintenance of highways, geological surveys, in some positions.

Skill in: assembling tools to perform a variety of tests, consecutively, with limited direction; the use of laboratory equipment and in performing laboratory tests. The use of sampling and testing equipment for materials testing and analysis; coordinating the work of others and maintaining an efficient workflow; communicating with a wide variety of department and non-department individuals; independently analyzing materials and conditions.

Ability to: set up and solve mathematical equations using addition, subtraction, multiplication and division; recognize test results outside of limits normally expected; perform basic scientific tests to determine the physical properties of materials used in the construction and maintenance of highways; convert standard weights and measures into units different from those given, including basic metric units; interpret road design plans, terminology and soils mapping data; schedule, assign, guide, and evaluate the work of Materials and Tests Technicians; read and understand engineering blue prints; operate and evaluate various types of sampling, testing, and inspection equipment used in the materials analysis process; read, understand, and apply complex design plans, shop drawings, codes, standards, specifications, and guidelines in order to plan, direct, and enforce testing and inspection procedures; record and communicate data or observations; prepare technical recommendations.

MINIMUM QUALIFICATIONS: (Applicants will be screened for possession of these qualifications. Applicants who need accommodation in the selection process should request this in advance.)

Any combination of training and/or experience that will enable the incumbent to possess the required knowledge, abilities and skills. A general qualification guideline for positions in this class is a high school education or the equivalent and experience in highway construction inspection or materials testing or other laboratory operations.

[Return to Specification List](#)

Highway Materials and Research Technician III

M53633

DESCRIPTION OF OCCUPATIONAL WORK

Under limited supervision, independently plans, coordinates, directs and performs tests and/or inspections on location statewide and/or within the central laboratory; analyzes acquired data; coordinates laboratory and/or inspection unit activities; performs related work as required.

DISTINGUISHING CHARACTERISTICS: (A position is assigned to this class based on the scope and level of work performed as outlined below.)

The Highway Materials and Research Technician III class is the third and full-performance level in the series and involves independent planning, coordination, and supervision of materials testing programs. This classification oversees and directs testing operations statewide, ensuring compliance with specifications, managing data analysis, and leading specialized inspections such as steel bridge fabrication and pavement friction testing. Technicians at this level provide expert recommendations, guide lower-level staff, and coordinate with contractors, engineers, and regulatory agencies. The distinguishing factor of this level is its leadership role in quality control and program management.

EXAMPLES OF WORK: (A position may not be assigned all the duties listed, nor do the listed examples include all the duties that may be assigned.)

Receives or initiates work assignments; schedules, assigns, coordinates, and guides the work of a unit's technicians in accordance with established requirements to assist supervisory staff in the timely accomplishment of the assigned workload.

Reviews and reports on the work performance of co-workers to determine overall conformity to established timetables and quality standards, and to document and communicate employee production levels and training needs.

Communicates with Nebraska Department of Transportation (NDOT) field personnel, contractor personnel, and materials suppliers/producers regarding the use and/or sampling of construction materials.

Directs the NDOT pavement friction program to include operation, maintenance and calibration of the computer-controlled pavement friction tester; collection of pavement friction data on location statewide; preparation of pavement friction reports; and recommendations relating to pavement friction.

Performs inspection of steel bridges and miscellaneous fabricated metal products at fabrication facilities, both in-state and out-of-state, such as inspection of welding procedures, welding materials, dimensions, camber, sweep, accuracy of punched and drilled holes, painting operations, mill certifications, etc.

Directs and/or performs sampling, testing, inspection and evaluation of concrete pipe and pre-cast concrete box culverts at concrete pipe plants statewide and directs and/or performs testing and analysis in the laboratory of steel and concrete materials used in concrete pipe and precasts concrete box culverts.

Directs drilling operations to determine strength and consolidation characteristics of soils, determines and performs tests and analyzes test data, noting potential and unusual soil problems.

Certifies NDO and contractor operators; certifies contractor profilographs; advises field personnel on profilograph operations and smoothness specifications.

Directs the installation of instrumentation to determine embankment settlement and stability, takes instrument readings and evaluates data noting unusual conditions.

Directs and/or performs environmental soil sampling activities to determine soil characteristics and status of soil contamination; prepares reports which advise and/or give guidance to appropriate personnel on specific subjects such as wetlands mitigation sites, leaking underground fuel storage tanks, electrical power sub-station contamination, and roadway sub-grade and drainage problems.

Directs the removal of underground storage tanks and pipes to include obtaining required permits, field testing, obtaining solid and/or water samples, preparing closure assessment reports, and coordinating activities with appropriate state and local agencies and consultants involved in ground water remediation projects.

Directs and coordinates a program for the monitoring of drinking water and wastewater treatment facilities at rest areas.

[KNOWLEDGE, SKILLS, AND ABILITIES REQUIRED: \(These are needed to perform the work assigned.\)](#)

Knowledge of: the techniques and procedures, involved in the sampling, testing, and inspection of materials used in the construction and maintenance of highways; the occupational hazards and safety precautions applicable to the work such as the proper use of safety equipment, equipment operation, and materials handling; the use of commonly issued testing equipment, devices, scales, ovens, moisture chambers, and strain gauges; materials sampling techniques, terms, and symbols; surface geology and soil map, in some positions; the requirements and intent of applicable codes, standards, and specifications for materials used in the construction and maintenance of highways. The standards and specifications involved in the testing and inspection of materials used in the construction and maintenance of highways. Basic engineering principles and practices as applied to the use and production of materials used in the construction and maintenance of highways, geological surveys, in some positions.

Skill in: assembling tools to perform a variety of tests, consecutively, with limited direction; the use of laboratory equipment and in performing laboratory tests. The use of sampling and testing equipment for materials testing and analysis; coordinating the work of others and maintaining an efficient workflow; communicating with a wide variety of department and non-department individuals; independently analyzing materials and conditions.

Ability to: set up and solve mathematical equations using addition, subtraction, multiplication and division; recognize test results outside of limits normally expected; perform basic scientific tests to determine the physical properties of materials used in the construction and maintenance of highways; convert standard weights and measures into units different from those given, including basic metric units; interpret road design plans, terminology and soils mapping data; schedule, assign, guide, and evaluate the work of Materials and Tests Technicians; read and understand engineering blue prints; operate and evaluate various types of sampling, testing, and inspection equipment used in the materials analysis process; read, understand, and apply complex design plans, shop drawings, codes, standards, specifications, and guidelines in order to plan, direct, and enforce testing and inspection procedures; record and communicate data or observations; prepare technical recommendations.

[MINIMUM QUALIFICATIONS: \(Applicants will be screened for possession of these qualifications. Applicants who need accommodation in the selection process should request this in advance.\)](#)

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[Return to Specification List](#)

[SPECIAL NOTES APPLICABLE TO ALL LEVELS:](#)

State agencies are responsible to evaluate each of their positions to determine their individual overtime eligibility status as required by the Fair Labor Standards Act (FLSA).

Some positions may require the ability to lift 85 pounds.

Some positions may require overnight travel.

A valid driver's license may be required.

Some positions may require obtaining a Commercial Driver's License.

Established: 08/95

Note: Classification-specification is subject to change. Please refer to the Nebraska State Personnel Job Specification website at <https://das.nebraska.gov/personnel/classcomp/jobspecs/jobspecs.html> to ensure this represents the most current copy of the description.

The following is a summary of changes made to this class specification.

Section	Change Description	Effective Date
Last revised on 10/1999	Moved to new format	11/2024
DESCRIPTION	Updated main Description of Occupational Work	11/2024
DISTINGUISHING CHARACTERISTICS	Added Distinguishing Characteristics for series levels	11/2024
Titles of all 3 Specifications	Changed the word Tests in titles to Research	09/2025
Examples of Work in Series	Added and removed wording and duties no longer completed	09/2025