

## Materials and Surfacing - Organization and Functions

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### Materials and Surfacing.

Supervised by: Chief Materials and Surfacing Engineer

Organization:

1. Materials
2. Pavement Design
3. Surfacing Plans
4. Concrete
5. Bituminous
6. Geotechnical
7. Region Materials

#### Functions of the Chief Materials and Surfacing Engineer:

Coordinates materials engineering as it relates to location, identity, mapping, options, blends, tests, specifications, construction, maintenance and structural design of pavement types.

Establishes major policy and assignment of areas of responsibility.

Receives and monitors requests for purchase of testing equipment.

Ensures the preparation of a materials certification based on sampling, testing and certification performed in connection with each project for submittal to the FHWA and the Director of Operations.

#### **1. Materials.**

Supervised by: Materials Engineer

#### Functions of the Materials Engineer:

Supervises the Department of Transportation building testing laboratories dealing with bituminous, concrete, aggregate, chemistry, nuclear gauges, and maintains AASHTO Laboratory Accreditation.

Provides technical assistance for solution of field problems involving materials or surfacing design.

Responsible for the purchase, assignment, repair and annual calibration of nuclear gauges.

Responsible for conducting periodic inspection and acceptance testing at wood treatment plants, evaluating traffic paints by placing of annual field test sections

and conducting other special acceptance tests, such as coating thickness, in the field.

A small volume of testing is performed for other governmental organizations and, when commercial facilities are not available, for individuals. Reimbursement at the DOT's approved rates is received for outside testing work performed.

**2. Pavement Design.**

Supervised by: Chief Materials and Surfacing Engineer

Functions of the Pavement Design Engineer:

Provides alternate structural designs for pavement selection.

After pavement selection, with the cooperation of Region Materials, Bituminous and Concrete Engineers, analyzes assembled data and develops recommendations for typical sections, type and thickness of pavement layers, material blends and sources and other factors affecting design and construction of the pavement.

Provides design and bituminous recommendations for overlay projects.

Makes recommendations for preparation of specifications for equipment, methods, aggregates, and materials used for construction.

Provides technical assistance for solution of field problems involving materials, subdrainage, or surfacing design.

Makes recommendations to the designer regarding aggregate blends, asphalt type, content, application rates, and other items related to asphalt construction.

**3. Surfacing Plans.**

Supervised by: Surfacing Plans Engineer

Functions of the Surfacing Plans Engineer:

Responsible for preparing surfacing plans and reviewing the surfacing portion of plans prepared by others.

Provides support for work involving the preparation of surfacing plans in the Region and by others.

Obtains technical data from the Geotechnical Engineer to assure adequate support for areas needing special treatment.

**4. Concrete.**

Supervised by: Materials Engineer

Functions of the Concrete Engineer:

Develops Portland cement concrete (PCC) design mixes for pavement and structures.

Provides technical assistance for field personnel to assist in plant calibration, solving construction problems, and interpretation of specifications, policies, and construction procedures.

Performs smoothness verification testing for Portland cement concrete (PCC) paving.

Makes recommendations for preparation of specifications for equipment, methods, aggregates, and materials used in concrete construction.

Makes annual inspections of the Region Materials Laboratories, checking their test equipment by calibration and comparative testing to establish uniformity and accuracy.

Determines the need for and assists in development of training in the areas of concrete construction.

Tests concrete pipe for acceptance.

Obtains core samples from completed Portland cement and asphalt concrete pavements for evaluation of pavement thickness.

**5. Bituminous.**

Supervised by: Materials Engineer

Functions of the Bituminous Engineer:

Provides mix designs for asphalt concrete to determine asphalt content for the specific mineral aggregate furnished for each project.

Provides technical assistance to field personnel on asphalt construction projects to assist in solving construction problems and clarifying specifications, policies, and construction procedures.

Performs smoothness acceptance testing on asphalt concrete construction.

Researches and evaluates existing structural surfaces and related asphalt materials.

Determines the need and assists in the development of training in areas of asphalt construction.

Responsible for the acceptance testing of all asphalt cement and liquid asphalt used in construction and maintenance statewide.

**6. Geotechnical:**

Supervised by: Geotechnical Engineer

Functions of the Geotechnical Engineer:

Responsibilities include preliminary engineering on bridge and roadway alignments primarily, but project responsibilities also follow through construction and maintenance.

Provides engineering data including geotechnical design parameters for fill and structure foundations, stability of rock and soil slopes, geologic studies, and the effective use of naturally occurring materials.

Activities include investigative borings, collecting undisturbed field samples, installing, monitoring and reading geotechnical instrumentation.

Conducts preliminary investigations of soils proposed for use on construction projects.

Analyzes the accumulated data and makes recommendations relating to soil selection, construction control limits of moisture and density, grade height and needed subdrainage facilities.

Obtains geophysical data and analyses samples with emphasis on soil strength determination.

Combines field, laboratory and historic data with graphic subsurface profile to make recommendations for the designer.

Coordinates project operations through the office that is responsible for the project, i.e., Bridge Engineer, Operations Engineer, State Engineer, etc.

Working with the Region Materials Engineers, the Geotechnical Engineer is responsible for locating, securing options and haul agreements for borrow sources.

Make recommendations for bridge end backfill and undercut on structure projects.

**7. Region Materials.**

Supervised by:       Region Materials Engineer

Functions of the Region Materials Engineer:

Responsibilities on preliminary engineering work include scouting, locating, optioning, mapping, sampling, recording, and submitting samples and data for materials needed for construction projects.

With Region Engineer's approval, makes material recommendations to the Materials Engineer in Pierre. Advises project technicians in the use of correct sampling and testing procedures in accordance with the South Dakota Materials Manual, AASHTO, and ASTM.

Promotes and maintains accuracy and uniformity of sampling and testing by project personnel through a program of field laboratory and equipment inspection and a continuous comparative sampling and testing program.

Insures that minimum requirements for independent assurance sampling and testing are met and that the comparisons with acceptance tests results are promptly made, documented and reported.

**NOTE: The Region Materials personnel shall not give oral or written orders to the Contractor, subcontractors or their employees.**