

Work Type Definition: Materials Testing and Drilling



I. Description

This type of work requires testing various materials in accordance with the proper procedure, reporting results compared to the corresponding specifications, and making recommendations for materials disposition (if required).

II. Standards and specifications

Standards and specifications required for a project under this work type may include the following:

- A. Reporting must meet requirements of AASHTO R 18 and recommendations.
- B. Trained personnel with calibrated equipment will perform all test procedures in accordance with the requested standard.
- C. Electronic test data must be compatible with the current database structure of Hennepin County.
- D. The laboratory, not the company, performing the testing must be accredited by the AASHTO Materials Reference Laboratory (AMRL) or a comparable laboratory accreditation program approved by MnDOT / Hennepin County and the FHWA for all test procedures performed. Use the website below to verify which laboratories are accredited in which tests, as the prequalification list is only for general approval. A list of the currently accredited laboratories and the tests in which they are accredited can be found at:
www.amrl.net/amrlsitefinity/default/aap/r18labs.aspx.

III. Provided by Hennepin County

Information to be supplied by Hennepin County (if not available on MnDOT web site) for a project may include the following:

- A. MnDOT Manuals (Laboratory, Concrete, Grading and Base, Bituminous), MnDOT Standard Specifications for Construction, and Special Provisions of the contract

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IV. Provided by consultant

Deliverables to be supplied by the consultant for a project may include the following:

- A. Final Materials Test Report meeting the requirements of AASHTO R 18 and recommendations (if required).
- B. Final Materials Test Report (both paper and electronic) submitted to requestor upon completion and in conformance with the negotiated time requirements and frequency.

I. Description – Geotechnical laboratory testing

This type of work includes conducting tests on soil and rock for the purpose of classifying materials and identifying their physical properties. The tests in soil include moisture content, grain size, Atterberg limits, permeability, consolidation, unconfined compression, direct shear, and triaxial. Laboratories will be approved for Level 1, Level 2 or both as defined below.

A. Level 1 – Standard Tests

Level 1 Projects will include the following standard tests which need to be accredited by the AASHTO Materials Reference Laboratory (AMRL).

- a. Moisture content
- b. Grain size
- c. Atterberg Limits
- d. Unconfined compression
- e. Consolidation

B. Level 2 – Specialized tests

Level 2 Projects will include the following specialized tests which need to be accredited by the AASHTO Materials Reference Laboratory (AMRL).

- a. Permeability (Constant head and falling head)
- b. Direct shear
- c. Triaxial (UU, CU, and CD)

**Work Type Definition:
Materials Testing and Drilling
Standards and Specifications**

Standards and specifications required for a project under this work type may include the following:

- A. All tasks will be performed in accordance with current ASTM, AASHTO, and, for highway construction projects, MnDOT standards and specifications. The current Specifications for Subsurface Investigation & Geotechnical Analysis and Design Recommendations can be found at:

<http://www.mrr.dot.state.mn.us/geotechnical/foundations/tcontract/consultdrillreport.doc>

II. Provided by Hennepin County

Information to be supplied by Hennepin County for a project may include the following:

- A. American Society for Testing and Materials (ASTM), American Association of State Highway & Transportation Officials (AASHTO), and MnDOT Standard Specifications.

III. Provided by consultant

Deliverables to be supplied by the consultant for a project may include the following:

Final laboratory test results with numerical and graphical output in a paper and electronic format.

Work Type Definition:
Materials Testing and Drilling
Standard Penetration (SPT) & Rock Coring

I. Description

Investigations will identify and locate, both horizontally and vertically, significant soil and rock types, ground water conditions, and establish the characteristics of the subsurface materials visually, by sampling, and by laboratory and in-situ testing. The methodology involved includes on-site investigations by performing standard penetration tests and rock coring. Specialized test equipment may also be required, such as the field vane shear, pressure meter, or dilatometer. This work type also includes the installation of instrumentation such as piezometers and slope indicators.

II. Standards and specifications

Standards and specifications required for a project under this work type may include the following:

- A. All tasks will be performed in accordance with current ASTM, AASHTO, and, for highway construction projects, MnDOT standards and specifications. All investigations will be conducted in accordance with current Minnesota Department of Health Regulations. The current Specifications for Subsurface Investigation & Geotechnical Analysis and Design Recommendations can be found at <http://www.mrr.dot.state.mn.us/geotechnical/foundations/tcontract/consultdrillreport.doc>.

III. Provided by Hennepin County

Information to be supplied by Hennepin County for a project may include the following:

- A. Plans showing existing topography, proposed alignments, and locations of the existing and proposed structures.
- B. Information (plans) showing property ownership information for boring locations off of state right-of-way.
- C. Bridge benchmark information for determining boring elevations.
- D. American Society for Testing and Materials (ASTM), American Association of State Highway & Transportation Officials (AASHTO), and MnDOT standard specifications.

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IV. Provided by Consultant

Deliverables to be supplied by the consultant for a project may include the following:

A. Final Standard Penetration Test (SPT) and/or Rock Coring Investigation Report

- i. Final boring logs in hard copy and electronic format (.gpj)
- ii. A copy of the driller's field boring logs and samples if required.
- iii. Weekly progress reports.
- iv. SPT hammer calibration reports.
- v. Minnesota Department of Health sealing records.

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**Work Type Definition:
Materials Testing and Drilling
Cone Penetration Test**

I. Description

Investigations will identify and locate, both horizontally and vertically, significant soil types, ground water conditions, and establish the characteristics of the subsurface materials by in-situ testing. The methodology involved includes on-site investigations by performing Electronic Cone Penetration Tests.

II. Standards and specifications

Standards and specifications required for a project under this work type may include the following:

- A. All tasks will be performed in accordance with current ASTM, AASHTO, and, for highway construction projects MnDOT standards and specifications. All investigations will be conducted in accordance with current Minnesota Department of Health regulations. MnDOT's current Specifications for Subsurface Investigation & Geotechnical Analysis and Design Recommendations.

<http://www.mrr.dot.state.mn.us/geotechnical/foundations/tcontract/consultdrillreport.doc>

III. Provided by Hennepin County

Information to be supplied by Hennepin County for a project may include the following:

- A. Plans showing existing topography, proposed alignments, and locations of the existing and proposed structures.
- B. Information (plans) showing property ownership information for boring locations off of state right-of-way.
- C. Bridge benchmark information for determining boring elevations.
- D. American Society for Testing and Materials (ASTM), American Association of State Highway & Transportation Officials (AASHTO), and MnDOT Standard Specifications.

IV. Provided by Consultant

Deliverables to be supplied by the consultant for a project may include the following:

- A. Final Cone Penetration Test Investigation Report
 - i. Electronic data for data collection (.dat file) and final logs (.gpj file)
 - ii. Hard copy of final logs (.pdf)
 - iii. Weekly progress reports.
 - iv. Minnesota Department of Health sealing records.

Work Type Definition: Materials Testing and Drilling

Solid Stem Auger Drilling

I. Description

The proposed work and services consist of taking solid stem borings and providing a detailed boring log. Investigations will identify and locate borings, both horizontally and vertically. boring logs shall identify the in-situ pavement structure, soils, rock, ground water conditions, and establish the characteristics of the subsurface materials visually, by sampling, and by laboratory testing according to MnDOT standards and specifications.

II. Standards and specifications

Standards and specifications required for a project under this work type may include the following:

All tasks will be performed in accordance with current ASTM, AASHTO, and MnDOT standards and specifications. All investigations will be conducted in accordance with current Minnesota Department of Health Regulations as well as MnDOT Specifications. The current MnDOT Specifications for Soils Investigation can be found at:

<http://www.mrr.dot.state.mn.us/pavement/PvmtDesign/Documentation/soilsinv.pdf>

III. Provided by Hennepin County

Information to be supplied by Hennepin County for a project may include the following:

- A. Plans showing existing topography, proposed alignments, existing and proposed profiles, and locations of the existing and proposed structures.
- B. Information (plans) showing property ownership information for boring locations off of State Right-of-Way.
- C. American Society for Testing and Materials (ASTM), American Association of State Highway & Transportation Officials (AASHTO), and MnDOT Manuals and Standard Specifications.

IV. Provided by Consultant

Deliverables to be supplied by the consultant for a project may include the following:

- A. Boring plan, soils profile, electronic boring log, field notes (if required), laboratory samples, and cross sections (if required). All work shall be performed to the extent necessary for the design of the most economical, uniform and stable roadway.
 - i. A copy of the driller's field notes (if required).
 - ii. Final boring logs in paper and electronic format using MnDOT's "Soils Data Dictionary".
 - iii. Soil samples for laboratory testing when Requested.
 - iv. Weekly progress reports.
 - v. Minnesota Department of Health sealing records.

**Work Type Definition:
Materials Testing and Drilling**

Materials Sampling & Testing- Field Sampling and Testing

I. Description

Materials sampling and testing includes the sampling and testing of all component materials used on the project and submittal of samples to the Hennepin County Materials Laboratory for testing or other laboratory if directed by Hennepin County. Field testing may include, but is not limited to, concrete (air tests, slump tests, cylinders, etc.), plant inspection, bituminous (asphalt cement samples, temperatures, quantity weigh tickets, gradations, etc.), grading and base materials (gradations, moisture, density, etc.), and pile driving (driving depth, etc.). Materials not meeting the designated criteria are to be rejected and not incorporated into the work.

II. Standards and Specifications

Standards and specifications required for a project under this work type may include the following:

- A. Materials testing will be done in accordance with current MnDOT Schedule of Materials Control and MnDOT Standard Specifications for Construction or as modified by the Contract special provisions.
- B. Where the MnDOT Schedule of Materials Control specifies laboratory/Agency testing, those tests will be performed at the identified Hennepin County Materials Laboratory.
- C. Consultant will be responsible for delivering the samples to the identified Hennepin County Materials Laboratory.
- D. All testing is performed on testing equipment that is calibrated at least once per year, or at the specified intervals, in accordance with MnDOT's Laboratory, Bituminous, Concrete and Grading and Base Manuals.

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III. Provided by Hennepin County

Information to be supplied by Hennepin County for a project may include the most recent version of some or all of the following:

- A. Contract documents
- B. MnDOT Schedule of Materials Control
- C. MnDOT Standard Specifications for Construction
- D. MnDOT Bituminous Manual
- E. MnDOT Concrete Manual
- F. MnDOT Laboratory Manual
- G. MnDOT Contract Administration Manual
- H. MnDOT Grading and Base Manual
- I. MnDOT Bridge Construction Manual
- J. MnDOT Bridge Standard Plans
- K. MnDOT Standard Plans Manual
- L. MnDOT Standard Plates Manual
- M. MnDOT Standard Signs Manual
- N. MnDOT Technical Manual
- O. MnDOT Traffic Engineering Manual
- P. MnDOT Labor Compliance Manual
- Q. MnDOT Technical Certification Handbook
- R. MnDOT Technical Memorandums
- S. Staking Information Sheets
- T. Minnesota Manual of Uniform Traffic Control Devices (MN MUTCD)
- U. MnDOT Landscape Projects Manual

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IV. Provided by Consultant

Deliverables to be supplied by the consultant for a project may include the following:

- A. Materials sampling and testing—Field sampling & testing project-specific reports and documents.
- B. Daily diaries, logs and records for a record of the contractor's progress
- C. Documentation of materials sampling and testing
- D. Necessary concrete, bituminous and grading and base reports.