

**Level IV Content Outline****Senior Engineering Technician**

The candidates for NICET certification at Level IV in Construction Materials Testing – Soils should have the knowledge, experience and skills needed to serve as project managers under the guidance of a registered professional engineer. They coordinate geotechnical services for large projects; develop project budget estimates; create complex sampling programs; select the appropriate tests; supervise geotechnical soils laboratory and field testing operations; provide technical expertise for fill placement, shallow and deep foundations construction; trouble shoot problem areas; evaluate technical data, materials, conditions and give recommendations; supervise and train Levels I, II and III technicians, reviewing their testing procedures and practices; manage equipment maintenance and calibration; manage safety and accreditation programs; and prepare reports.

4.1 Personal and Worksite Safety

(Questions related to these tasks make up 1-9% of the exam.)

4.1.1 Lead internal safety meetings.

4.2 Plans and Specifications

(Questions related to these tasks make up 10-20% of the exam.)

4.2.1 Develop project budgets and estimates.

4.3 Sampling of Soils

(Questions related to these tasks make up 1-9% of the exam.)

4.3.1 Create a complex soil sampling program. 5, 13, 16, 27, 38

4.4 Soils Sample Preparation

(Questions related to these tasks make up 1-9% of the exam.)

4.4.1 Oversee sample preparation activities performed by Level I, II, or III technicians. 6, 7, 8, 10, 11, 12, 14, 15, 37

4.5 Field Testing of Soils

(Questions related to these tasks make up 1-9% of the exam.)

4.5.1 Perform shear test. 23

4.5.2 Perform complex (high load) pile load tests. 20

4.6 Laboratory Testing of Soils

(Questions related to these tasks make up 1-9% of the exam.)

4.6.1 Calculate mix proportions for soils stabilization projects. 24

4.6.2 Interpret soils test results. 20

4.6.3 Prepare geotechnical reports. 38

4.7 Field Observation of Soils Construction Operations

(Questions related to these tasks make up 1-9% of the exam.)

4.7.1 Resolve soils field problems. 9, 13, 22, 23, 33, 38

4.8 Evaluation of Soils Test Results

(Questions related to these tasks make up 10-20% of the exam.)

4.8.1 Perform preliminary interpretation of test data. 8, 11, 13, 16, 17, 20, 34, 36, 37

4.8.2 Troubleshoot and identify suspect soils test data. 6, 10, 12, 14, 17, 18, 20, 22

4.9 Quality System

(Questions related to these tasks make up 15-25% of the exam.)

4.9.1 Create soils testing laboratory quality system. 4, 25, 35

4.9.2 Approve and schedule outside vendors for equipment calibration. 4, 25, 35

4.9.3 Manage soils laboratory accreditation. 4, 25

4.9.4 Create record keeping system for equipment calibration and maintenance activities. 4, 25



4.10 Reporting and Supervision

(Questions related to these tasks make up 5-15% of the exam.)

4.10.1 Resolve communication and related work conflicts. 15, 19, 21, 29, 33

4.10.2 Finalize soils test reports. 10, 33, 37

4.10.3 Develop preliminary recommendations for Engineer in Charge. 16, 26, 30

4.10.4 Manage company resources (e.g., employees, schedules, budget, equipment).

4.11 Training

(Questions related to these tasks make up 5-15% of the exam.)

4.11.1 Train Level I, II, and III technicians for field and laboratory testing. 1, 2, 3, 9, 12, 17, 19, 28, 31, 32

4.11.2 Verify and document technician proficiency and training activities. 4, 25

December 1, 2019 footnote number is linked to a reference on the Selected General References listing